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- A multi-faceted intervention to improve screening of erectile dysfunction for men with diabetes mellitus in public health clinics: A pilot study
- Factors influencing pap smear screening uptake among women visiting outpatient clinics in Johor
- Prevalence and factors associated with sexual dysfunction among middle-aged women in a multi-ethnic country: A cross sectional study in Malaysia



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EDITORIAL

Quality doctor-patient communication for better patient satisfaction in primary care practice

Ping Yein Lee

Editor in Chief

Lee PY. Quality doctor-patient communication for better patient satisfaction in primary care practice. *Malays Fam Physician*. 2022;17(2):1. <https://doi.org/10.51866/ed0005>

Doctors' communication skills during consultation play an essential role in patient satisfaction. Good doctor-patient communication was associated with better patient satisfaction with their care, which led to better compliance with advice and treatment and thus better outcomes.¹ In this issue, we published two articles that provided additional insights about the importance of the quality of doctor-patient communication to improve patient satisfaction.^{2,3} Kabir MJ et al. reported that two-thirds of the patients were satisfied with healthcare service providers in Iran, and were most satisfied with the family physicians' behaviour and communication skills. The determinants of patient satisfaction included choosing a previously known family physician, acceptance of the family physician, and a positive attitude towards the importance of having a family physician.² In another local study by Leow HT et al., the perceived length of the consultation exceeding the expected length of the consultation was significantly associated with a higher satisfaction score.³ These two articles suggested that the main elements that may contribute to patient satisfaction were patient perception and attitudes. Therefore, in busy clinic sessions with time constraints, it is fundamental to ensure that quality consultation time is spent to ascertain and manage the expectations and psychosocial needs of the patient for better patient satisfaction.⁴ In the current era of information and communication technology, electronic communication and clarifying patients' needs prior to clinic sessions may also enhance the patient experience during the consultation without increasing the consultation time.⁵

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COMMENTARY

Recommendations and tips for passing the key feature problem examination

Siew Kim Kwa, Chow Wei Tan, Aik Chiew Ng, Sheikh Mohd Amin Sheikh Mobarak, Hairel Anuar Selamat

Kwa SK, Tan CW, Ng AC, et al. Recommendations and tips for passing the key feature problem examination. *Malays Fam Physician*. 2022;17(2):2-9. <https://doi.org/10.51866/cm0003>

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Abstract

The Key Feature Problem (KFP), is part of the Conjoint MAFP/FRACGP exit examination for Family Medicine specialisation in Malaysia. KFP tests candidates' skills in clinical reasoning and decision making. Over the years, KFP has been the cause of most of the failures in the Part 1 theory examination. This paper aims to highlight common errors committed by candidates and provide recommendations and practical examination technique tips on how to mitigate these errors. A summary of the 26 KFP cases used in the 2020 Conjoint KFP examination demonstrates the breadth and types of cases. From the feedback reports collated from eight assessors involved in this exam, we determined that although inadequate knowledge is probably the main contributor to failure, other easily correctible mistakes made by candidates further aggravate the situation. Common errors include offering more answers than requested, giving duplicate or incomplete answers, and writing answers out of context to the case scenario. The paper concludes with recommendations and sources for effective learning, and provides 12 examination technique tips. The tips include time management, reading carefully through the case, and checking that the answers are congruent with the questions asked.

Introduction

For many years, the Academy of Family Physicians of Malaysia (AFPM) has been conducting a 4-year postgraduate training course leading towards the international Conjoint MAFP/FRACGP exit examination for independent practice as a family physician.¹ This examination is a collaboration between the AFPM and the Royal Australian College of General Practitioners (RACGP).

The AFPM postgraduate Family Medicine Training Programme consists of two years of distance learning conducted through the Graduate Certificate in Family Medicine (GCFM), and an additional two years of Advanced Training in Family Medicine (ATFM), with additional support from monthly mentor-mentee meetings.

The Conjoint exam has two components: Part 1 (theory) and Part 2 (clinical). In Part 1, the questions are set in two different formats: Applied Knowledge Test (AKT), which consists of single-best and extended matching questions, and Key Feature Problems (KFPs). The KFP examination was first introduced into the RACGP fellowship examination in 1997,² and it was incorporated into the Malaysia-

Australian Conjoint MAFP/FRACGP examination in 2000. The primary objective of the KFP is to test the candidate's ability to reason, make decisions, and solve problems. These skills are essential for the appropriate management of their patients.

A key feature is defined as a critical step in the resolution of a clinical problem;³ making an incorrect decision can lead to irreversible damage or even death for the patient. In the KFP exam format, a case scenario accompanied by two to four questions, is presented. For each question, candidates are instructed to either 'write in' or 'select' a specified number of answers from a list of options. Writing in the answers is deemed to be more challenging and discriminating than selecting from a list, as the latter offers cues, and provides an advantage for the weaker candidates.²

The KFP exam has been found to be a valid and reliable test for the future independent family doctor.²⁻⁴ Unlike the single answers required in AKT, the KFP allows for multiple answers. This mirrors the real-life situation faced by practising doctors when several options for diagnoses, investigations, and management are possible. KFPs also have

provision for the longitudinal care of the patient.⁴

KFP cases are selected based on an examination blueprint to incorporate the broad variety of patients and diseases encountered in the Family Medicine curriculum. The questions are rigorously vetted and reviewed, initially by the examination team in AFPM, and twice by the RACGP. There is also a rigorous standard setting process, with 20–25 judges using Norcini's concept of the borderline candidate⁵ to determine the cut-off score required of a candidate with minimal level of skill or knowledge to be a safe practising physician.

When determining the cut-off score for a particular question, judges take into consideration the complexity of the case and whether the required answer is written in or selected. Selecting answers from a list is considered to be easier for candidates. Previously, selection of answers has been limited to only one-third of KFP cases.² With standard setting, 'select' questions now make up one-half of the KFP cases; these questions are mainly reserved for investigations.

Most of the Malaysian candidates who fail Part 1 of the conjoint examination, fail due to the KFP paper, although they may have passed the AKT. Due to examination confidentiality, this data is not available for publication. The Australian KFP exam report for 2020⁶ showed similar findings, with more failures in the KFP than the AKT.

Despite candidates being trained to answer KFP questions in every module, in addition to having practised the KFP exams during ATFM workshops, candidates continue to perform poorly on the KFP. One possible reason is the paucity of local guidance^{1,7} or practice-question books⁸ for KFP, unlike the abundant availability of MCQ practice books for the single-best answer and extended matching questions in the AKT. Coaching for KFP is available via Australian training providers, one of which is ModMed⁹; however, this incurs an additional high financial cost.

Following the 2020 KFP examination, the eight examiners involved in correcting the papers were invited to submit their written comments on candidates' performance. Although failure was attributed partly to the candidates' inadequate knowledge, poor clinical reasoning, and poor clinical

decision-making skills; lack of knowledge of examination techniques and poor adherence to instructions were further aggravating factors. Twelve of these common mistakes and pitfalls have been identified.

This manuscript aims to provide future candidates with guidance on their approach to tackling the KFP paper to improve their chances of passing. Guidance will include recommendations on how to enhance their knowledge base and decision-making skills, in addition to 12 simple examination technique tips to follow.

Summary of the cases in the 2020 KFP examination

Table 1. Cases from the 2020 Conjoint MAFP/FRACGP KFP Examination

Case	
1	55-year-old cleaner with carpal tunnel syndrome presenting with pain in the hand: for diagnosis and management.
2	74-year-old man presenting with intermittent tinnitus and deafness for a few years, with a recent brief spell of dizziness: for diagnosis, interpretation of investigation, and management.
3	35-year-old woman with occupational asthma presenting with recurrent cough: for diagnosis, interpretation of investigations, and management.
4	30-year-old para 1 with menorrhagia and iron deficiency anaemia from uterine fibroids presenting with tiredness: for diagnosis, data interpretation, and management.
5	37-year-old man presenting with sudden onset of palpitation and chest discomfort: for data interpretation, diagnosis of rapid ventricular fibrillation, and management.
6	42-year-old elderly primigravida with hypertension in pregnancy presenting for antenatal booking: for risk identification, selection of investigations, and management.
7	18-year-old student brought in by parents due to change in behaviour: for differential diagnoses, selection of investigations and management.
8	30-year-old man presenting with progressive low back pain with features of ankylosing spondylitis: for data interpretation, selection of investigations, and management.
9	3-year-old girl brought in by parents for fever and increased urinary frequency: for data interpretation, diagnosis of urinary infection, selection of investigations, and management.

Case	
10	35-year-old volunteer traveling to a remote region: request for vaccination, advice on prevention of diarrhoea, and selection of investigations for chronic diarrhoea.
11	12-month-old girl brought in for sudden onset of breathing difficulty and generalised rash after ingesting some food: for initial treatment of anaphylaxis and future prevention.
12	56-year-old woman with previous PTB, long-standing hypertension, and asthma, presenting with persistent cough: for diagnosis and selection of investigations.
13	72-year-old woman with terminal cancer: for end-of-life care, clinical features of impending death, and management of breakthrough pain.
14	17-year-old rugby player presenting with fever, sore throat, rash after an antibiotic, and moderate splenomegaly: for diagnosis, selection of investigations, and management.
15	12-month-old infant with persistent diarrhoea due to lactose intolerance following acute gastroenteritis: for diagnosis, and management strategies.
16	10-year-old boy with acute-on-chronic slipped upper femoral epiphysis: for diagnosis, selection of investigations, and management.
17	21-year-old teacher presenting with painless genital growth (condylomata lata): for diagnosis, selection of investigations, and management of syphilis.
18	8-year-old girl with enuresis: for diagnosis of type 1 diabetes mellitus, selection of investigations, and management of complications of diabetic ketoacidosis.
19	20-year-old student with vertigo, delayed lower motor 7th cranial nerve palsy, and Battle sign following fracture of the petrous temporal bone: for diagnosis and management.
20	Practice management issue involving a justifiably angry patient who was not recalled for abnormal test results: for management strategies and prevention.
21	48-year-old woman with a 1-year history of gradual weight gain, fatigue, dry skin, and irregular menstrual cycles: for diagnosis of Hashimoto's thyroiditis, data interpretation, and counselling regarding medication.
22	65-year-old retired teacher with recent onset of epilepsy: to identify issues with driving, medications, and drug interaction with Gingko biloba
23	28-year-old morbidly obese woman requesting bariatric surgery: for selection of investigations, management of obesity, and indications of bariatric surgery

Case	
24	34-year-old bodybuilder with hypogonadism, tiredness, and sexual dysfunction: for further history to elicit and investigations to order.
25	28-year-old first-time mother presenting 10 days after delivery: for diagnosis and management of postpartum blues/postpartum depression and management of episiotomy wound pain.
26	17-year-old student: for diagnosis and management of severe nodulocystic acne, treatment for scarring, and management of depression.

This Conjoint exam has been designed to cover all topics and domains in the Family Medicine curriculum in Malaysia and Australia. As can be seen in [Table 1](#), the 2020 KFP examination covers the breadth of family medicine encounters; from womb to tomb, and from preventive to acute, chronic, and palliative. Cases may be common but complicated, or rare but with long-term dangerous consequences if not diagnosed early.

Most candidates fail to answer questions regarding secondary syphilis in Case 17. A possible reason is that most of them work in government public clinics and may not have personally managed sexually transmitted infections (STIs), as these patients prefer the privacy of fee-for-service general practice clinics. When undertaking any courses, the trainees' foremost responsibility is to be aware of the curriculum—STIs are within the curriculum. As future independent practitioners, trainees are expected to function in any setting, whether public or private. It is advised that candidates should identify and fill their knowledge gaps in the curriculum.

As this is a Conjoint examination, the KFP exam can include diseases like infectious mononucleosis, which is common in Australia. Candidates should be aware of the epidemiology of diseases in Australia. A clue on whether the case is Australian or Malaysian lies in the patient's name or case scenario.

Why do candidates fail?

The post-examination analysis based on examiners' feedback suggests that inadequate knowledge coupled with poor examination techniques are causes for KFP failure. To answer KFP questions well, candidates must have adequate prior knowledge and experience, and must be able to identify the key information provided in the scenario. Only

then can they use their clinical reasoning to determine the most appropriate decision to resolve the problem, taking into consideration the case's unique features.

Clinical decision-making (CDM) skills are an essential core competency expected of an independent primary care provider. CDM is particularly difficult in Family Medicine, as we deal with all population groups, and all stages of disease manifestation, including early disease with vague symptoms and diagnostic uncertainties. We must also manage patients with multiple morbidities, using evidence-based clinical practice guidelines that mainly focus on single disease and tertiary management. Without a strong knowledge base and clinical experience, candidates will not be able to develop sufficient CDM skills to take into consideration the context, clinical setting, patients' circumstances, and the legal and ethical aspects of the cases.

Recommendations on how to improve knowledge and clinical decision-making skills

Reflection

Acquiring CDM skills is a difficult lifelong learning process that requires knowledge, experience, and reflection. Trainees should start by reflecting daily on their challenging cases and patients with issues. They should search for the latest guidelines, discuss the cases with their supervisors, mentors, or other trainees, explore differential diagnoses, and write reflective reports on how they will approach and manage similar cases differently in the future.

Using study aids and RACGP learning resources

A useful approach utilised by experienced family doctors is spot diagnosis and pattern recognition: Case 11 - acute anaphylactic shock, Case 14 - infectious mononucleosis, Case 17 - condylomata lata, Case 19 - Battle sign, and Case 26 - acne. The use of pictorial atlases for dermatology and other conditions with characteristic appearances are very helpful for initial and differential diagnoses. This must be supplemented by using up-to-date clinical practice guidelines on investigations and management. Some candidates were able to diagnose the problems but did not know the immediate and long-term management.

The AFPM does not have a library, but as RACGP members, candidates can make use of the RACGP virtual library, clinical, and

other educational resources to access reference papers, clinical guidance, and become familiar with Australian practice.

Maximising AFPM study modules

In addition to formal assignments and practice exam questions that require submission for assessment, the GCFM and ATFM study modules provide extra references and exercises for directed self-learning. Reading the references and completion of these additional exercises are not compulsory or collated. Therefore, it is not known how many trainees have actually completed them, and received the full benefit of learning from their modules. Trainees should complete these additional teacher-directed exercises to improve their knowledge and, in turn, their clinical reasoning and decision-making skills. GCFM trainees can discuss problems with their peers or during the Module Workshops. ATFM trainees can bring up their difficulties with their peers, clinical supervisors, or during the monthly mentor-mentee meetings.

Study groups

Forming small study groups helps to pool expertise and resources (e.g., online examination guides, books, papers, ModMed subscription) for exam revision. Although no published data is available on the optimal number of candidates in a family medicine exam study group, university websites advise three to five members.¹⁰⁻¹¹

In summary, recommendations to improve knowledge and CDM skills include the use of reflection, RACGP educational resources, GCFM and AFPM study modules, and peer-to-peer learning from study groups.

In the next part of this paper, we discuss 12 practical exam technique tips that are easy to implement to improve candidates' chances of passing the KFP examination.

Twelve practical exam technique tips for passing

Tip 1

Keep track of the time

The KFP examination consists of 26 cases (25 cases after 2021) of equal weightage in scoring that must be completed within 3.5 hours. This allows approximately eight minutes per case, or seven cases per hour. Candidates should be aware of their timing so as not to spend too much time on difficult questions, and

leave inadequate time for others. As per the instructions, candidates must write point-form or brief notes rather than elaborate answers or full sentences.

Tip 2

Read through the whole case before answering

It is beneficial to read through the whole case before answering. Knowing subsequent scenarios and questions can provide clues. This is especially true for questions with answers regarding investigations and management options to be selected from a list.² The list of answers may trigger or provide cues to the diagnosis.

Knowing the subsequent scenario and questions can prevent candidates from writing an answer for one question when it is meant for the next question, which results in them losing marks for both. In Case 23, when asked about the management of obesity, candidates gave answers meant for the next question on indications for bariatric surgery.

Tip 3

Do not write-in or select more answers than asked

The examination rules are strictly enforced for the number of answers offered by candidates. Writing or selecting more choices than instructed, either intentionally or unintentionally, will cost candidates all their marks for that question, even though some of the answers may be correct. This is the easiest mistake to avoid. It has been highlighted in errors to avoid in 2007⁵ and is mentioned repeatedly throughout the programme.

Tip 4

Select the maximum number of options allowed

Conversely, some candidates who are fearful of making a mistake dare not select the maximum number of options allowed, and consequently lose marks. Candidates should eliminate obviously incorrect answers and then make an educated guess from the plausible options, selecting the maximum number of options allowed. There is no penalty for wrong answers (negative marking) but candidates must be aware of one caveat: when the question asks to tick as many answers as appropriate, they must be mindful of how many options to tick, as this process is a test for appropriate use of resources. Thus far, this line of questioning has not yet been asked.

Tip 5

Answer to the question

This is a common problem, mainly due to candidates not reading the question carefully or not understanding what is required. Sometimes, the candidates understand the question, but because they do not know the answer, they write extensively about something they know instead. This wastes precious time, leaving insufficient time to complete other parts of the examination.

Candidates must read the question carefully and, after answering, read the question again to ensure that they have answered it correctly. Case 25 asks for non-pharmacological management strategies for postpartum blues/depression; some candidates discussed drug treatment. Conversely, when asked for pharmacological management, some candidates instead mentioned hospital referrals and types of operations.

Tip 6

Answer according to the context of the case

A noted recurrent problem is that candidates do not read the case scenario carefully. They should underline important, key information given in the scenario and take into consideration the case context and patient's sociodemographic characteristics when offering diagnosis or management. In Case 22, the 65-year-old retired teacher with newly diagnosed epilepsy was advised by a candidate to avoid high-risk activities like parachuting and bungee-jumping—activities that were not stated as her hobbies, and which she was unlikely to do. A better example would have been 'cooking alone', as having an epileptic seizure would be dangerous while cooking.

A dangerous piece of advice resulting from not taking the age or disease into consideration was to recommend drinking 2–3 litres of water per day for hydration, to a 3-year-old girl with urinary infection. Another superfluous piece of advice given to a 10-day postpartum woman presenting for management of episiotomy wound pain was to avoid sexual intercourse. In Case 17, it was stated that the patient already had a normal Pap smear test one year ago. Offering a Pap smear again is unnecessary and caused the candidate to lose a mark, which could have been avoided by selecting a different investigation.

Tip 7**Do not write similar answers**

Writing similar differential diagnoses, like schizophrenia and schizophrenic disorder in Case 7, caused candidates to lose an opportunity to score a mark with another diagnosis. For management, be mindful not to repeat issues or plans. In Case 26 on severe acne, one candidate used up four of the six management plans to elaborate on facial cleansing alone.

Tip 8**Write complete answers for diagnoses**

Despite instructions asking for 'complete diagnosis', candidates often fail to provide this. For Case 4, a complete diagnosis should include 'iron deficiency anaemia secondary to menorrhagia from uterine fibroids', not 'anaemia' without the type of anaemia and underlying cause. For Case 7, writing 'depression' for diagnosis is incomplete and scores a zero mark because the patient clearly has psychotic features; the correct diagnosis would be 'depression with psychosis'.

For Case 18, writing 'diabetes mellitus' alone for diagnosis is incomplete and is scored as zero. Had candidates read the complete case, they could logically deduce that this was type 1 diabetes mellitus.

The diagnosis of acne in Case 26 is a very common adolescent problem and requires the inclusion of its severity ('severe' or 'nodulocystic' acne) for a complete answer, as this distinction is important for management. An answer of 'acne' alone scores a zero mark, as any layman can offer that answer.

Incomplete answers extend to interpretation of investigations. In Case 5, writing 'atrial fibrillation' alone is insufficient. The complete answer should be 'atrial fibrillation with rapid ventricular response', as the immediate management is a key feature that will determine the patient's outcome.

Tip 9**Provide details for management**

Some candidates continue to offer undergraduate-level answers, like 'counsel, reassure, explain, inform the diagnosis, inform side effects and complications, follow-up.' Such vague, non-specific answers without clarification or examples are unacceptable for KFPs. When including referral or admission as a management plan, a complete answer

should include the specialist for referral (e.g., orthopaedic surgeon), the clinic or hospital, urgency to be seen, whether an ambulance is required, and the reasons for referral or admission.

If the question asks specifically for a medication name, route of administration, dosage, and duration of treatment, it is important to use generic names and comply to the instructions. Unfortunately, some candidates are still unfamiliar with common medications used in primary care, their indications, interactions, contraindications, side effects, and dosing schedule.

In giving advice for follow-up, candidates should inform when the patient should be seen and specify red flags for which patients must present urgently.

Tip 10**Use only universally recognised abbreviations**

Candidates should not use abbreviations or acronyms unless they are well-established, such as 'BP' for blood pressure. A term must be written in full at its first usage (e.g., atrial fibrillation [AF]) before the abbreviation can be used subsequently. 'PID' can mean 'prolapsed intervertebral disease' or 'pelvic inflammatory disease'; 'SOB' does not necessarily mean 'shortness of breath'.

Tip 11**Be mindful of spelling and grammar mistakes**

Some candidates exhibit poor command of the English language, as reflected in many spelling and grammar mistakes. Examiners may opt to not give marks for diagnoses that are spelled incorrectly. In the 2021 examination, examples of incorrect spelling included 'zooster' and 'zoaster' for zoster, 'meazlese' for measles, 'hatching' instead of latching.

When candidates have poor command of English, examiners must decipher the meaning that the candidate is trying to convey. In a worst-case scenario, examiners may simply give a zero score rather than attempt to guess at the candidates' intended meaning.

Tip 12**Write legibly with adequate font size**

It is difficult for examiners to decipher handwriting that is illegible or small (i.e., font size 4–5) and to read sentences written all in capital letters. Poor handwriting could

be a deliberate attempt by candidates to cause confusion. In the answer for type 1 diabetes mellitus, '1' was written in such a way that it could have been read as either 1 or 2. It is unclear whether this was done intentionally by a candidate who was unsure if the diagnosis was type 1 or 2. Candidates should write clearly in a font size of at least 10. If answers are written in pencil, ensure that the lead is dark enough and all corrections are completely erased.

With the onset of online examination, poor handwriting would no longer be relevant, but candidates need to practise speed typing, using the same size font as set by the software, and not typing answers all in capital letters—this is tantamount to shouting.

In conclusion, failure to perform well on the KFP examination results from a combination of poor knowledge, decision-making skills, and examination techniques. Recommendations to improve knowledge

base and decision-making skills are provided with examination technique tips to improve the likelihood of passing the KFP exam.

Take-home message

1. Keep track of the time
2. Read through the whole case before answering
3. Do not select or write-in more answers than asked
4. Select the maximum number of options allowed
5. Answer to the question
6. Answer according to the context of the case
7. Do not write similar answers
8. Write complete answers for diagnoses
9. Provide details for management
10. Use only universally recognised abbreviations
11. Be mindful of spelling and grammar mistakes
12. Write legibly with adequate font size

How does this paper make a difference to Family Medicine?

- Key feature problems (KFP) test clinical reasoning and decision-making skills essential for resolution of problems and management of patients.
- Many candidates fail the KFP component in the Conjoint MAFP/FRACGP examination for Family Medicine specialisation.
- This paper reviews the causes of failure and common mistakes made by candidates in the 2020 KFP paper.
- Recommendations for improving candidates' performance and tips on examination techniques for KFP are provided.
- We hope that this paper will not only improve candidates' chances of passing the KFP exam, but also improve their clinical decision-making skills in future practice.

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REVIEW

Assessment tools to measure postnatal mental illness: A 10-year scoping review

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Abstract

Introduction: The use of assessment tools to measure postnatal mental illness is essential in healthcare settings. However, variations in the types of tools and their reliability in a particular population lead to under-recognition of mental health status in postnatal mothers. The aim of this review is to evaluate the most recent 10 year of research on the validity and reliability of postnatal mental illness assessment tools

Methods: A literature search of studies from online databases PubMed, Scopus, and Science Direct was conducted.

Results: A total of 59 studies were selected for this review. Several studies utilised multiple assessment tools, and a total of 96 assessment tools were identified and classified into six domains: postnatal blues, postnatal stress, postnatal anxiety, postnatal depression, postnatal psychosis, and postnatal psychological disorder. In this review, EPDS was the most common tool used to identify postnatal depression and anxiety while DASS 21 was the most common tool used to identify postnatal psychological disorder. There is a wide range in preponderance of evidence for the reliability of each assessment tool and there were inconsistencies in assessing the validity of the assessment tools.

Conclusion: This review provides information regarding some of the main assessment tools currently available to measure postnatal mental illnesses. There were no standardised tools that were used in a particular setting. The results may differ in different population because there are differences in not only languages and dialects, but also cultural and racial backgrounds, which greatly influences their perception and interpretation of postnatal mental illness.

Introduction

The postnatal period is one of the most transformative and critical times in a woman's life. A woman experiences not only physical changes, but also psychological, emotional, and social changes. Although childbirth is viewed as a joyous event filled with positive emotions, it may also cause postnatal mental illness due to the transition and adaptation of new demands and responsibilities.¹⁻³ The World Health Organization (WHO)⁴ described postnatal mental health as 'a state of well-being in which the individual realises his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community within postnatal period'. Therefore, postnatal mental illness can be defined as significant changes in thought, emotion, and/or behaviour resulting from distress with inability to function in social, work, community, or family activities within the postnatal period. This may include

postnatal blues, stress, anxiety, depression, and psychosis.

Postnatal blues can be defined as a brief period of mild mood disturbance after childbirth. It is the most frequent mood disorder in postnatal mothers. Postnatal blues is considered a common reaction due to hormonal changes and gradually diminishes within 2 weeks of childbirth.⁵ Postnatal stress is defined as a constraining force induced by postnatal stressors. The stressors can be social or non-social (physical) and occur within 6 weeks post-delivery.⁶ Postnatal stress is characterised by tension, chronic arousal, and a degree of impaired functioning. Postnatal anxiety is characterised by feelings of tension, worried thoughts, and physical changes.⁵ Postnatal depression is the most common mental health problem in postnatal mothers and is characterised by feeling of sadness, low mood, tearfulness, lack of enjoyment,

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lack of energy, loss of interest or pleasure, and impaired concentration, which are also referred to as 'depressive symptoms', during the postnatal period.⁷ Postnatal psychosis is characterised by hallucinations, delusions, and having extreme difficulty in responding emotionally to the infant; it is considered the most severe form of postnatal mental illness.⁸

Studies have shown that availability of assessment tools increases healthcare providers' (HCPs) confidence in dealing with perinatal mental illness, whereas the absence of such tools was shown to limit the management of these illnesses.^{9,10} Use of the assessment tools to detect postnatal mental illnesses in the primary healthcare setting is essential; however, most of HCPs have neither the time nor training to administer complex diagnostic interviews to all individuals at risk of mental illnesses.¹¹ Nevertheless, these assessment tools must be tested for their reliability and validity before being implemented in a particular population because cultural differences influence expression of mental distress, which includes physicalising symptoms. These differences may lead to under-recognition or misinterpretation of mental illnesses.^{11,12} The aim of this review is to identify the validity and reliability of available assessment tools used in prior studies to measure postnatal mental illnesses. In this review, postnatal mental illness refers to postnatal blues, postnatal stress, postnatal anxiety, postnatal depression, and postnatal psychosis.

Methods**Scoping review**

A systematic scoping review was conducted to gather evidence from the literature on the availability, validity, and reliability of postnatal mental illness assessment tools over the last 10 years. This method was selected to outline the different types of evidence available in the area of interest and to fill in the gaps for further research. This review was guided by the framework proposed by Arksey and O'Malley¹³ and the Joanna Briggs Institute (JBI),¹⁴ which recommend to follow five steps: (i) identifying the research question; (ii) identifying relevant studies; (iii) study selection; (iv) charting the data; and (v) collating, summarising, and reporting the results. Quality appraisal of the studies was not conducted as the review aimed to explore the general scope of the research conducted in this field.

Step 1: Identifying the research question

The main research question was 'What are the assessment tools used to assess postnatal mental illness?' The research sub-questions were: (i) 'What are the common assessment tools used to assess postnatal mental illness?' (ii) 'What types of postnatal mental illness were assessed?' (iii) 'Where were these assessment tool used?' and (iv) 'What is the reliability and validity of the assessment tools?'

Step 2: Identifying relevant studies

PubMed, Scopus, and Science Direct online database were searched from the years 2010 to 2020 to reflect the most up-to-date literature. The keywords were used in various combinations with AND and/or OR and the following MESH terms: postnatal or postpartum or maternal mental health, postnatal or postpartum or maternal mental illness, postnatal or postpartum psychiatric disorder, postnatal or postpartum blues, postnatal or postpartum stress, postnatal or postpartum anxiety, postnatal or postpartum depression, postnatal or postpartum psychosis, AND screening tool, assessment tool, instrument, or questionnaire, AND psychometric properties, reliability, or validity to identify relevant papers. The reference lists of the articles found through the electronic search were inspected to ensure that only relevant articles were included in the scoping review

Step 3: Study selection

This step aimed to identify the studies that would be included in the scoping review. The research team agreed on the eligibility criteria.

Inclusion criteria

The type of publication was journal articles. The language of publication was restricted to English or Malay. The articles reported psychometric properties of reliability or validity of the assessment tools used for any postnatal mental illnesses or postnatal psychological disorders in postnatal mothers within the first year of childbirth.

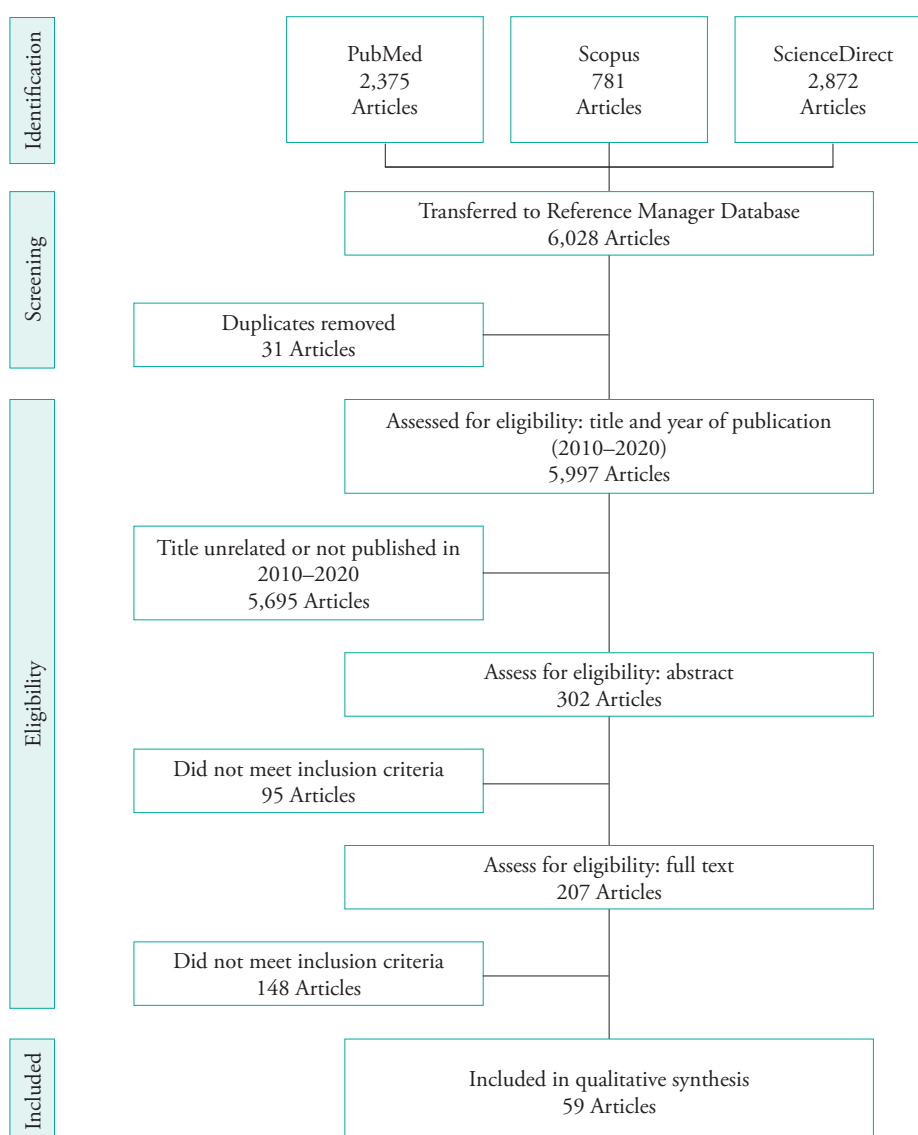
Exclusion criteria

Articles were excluded if they were review papers or if postnatal women were not the focus group of the study.

The application of further eligibility criteria ensured that the content of the included studies was relevant to the aim of the study

and research questions. All articles found in the databases were transferred to the reference manager database and duplicates were removed. The titles and abstracts were screened by a member of the team. The articles that did not meet the eligibility criteria were excluded and the full articles that fulfilled the eligibility criteria were retrieved. A sample of the retrieved articles was screened by another team member to ensure consistent application of the eligibility criteria. The results were reviewed by two researchers (primary and secondary researcher). Disagreements were discussed until a consensus was reached or by arbitration by a third researcher, if required. The article was included with a minimum agreement of at least 50% among the research team. The process of study selection was reported using a Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) flow chart.

Figure 1. Flow diagram of the search strategy for assessment tools used for postnatal mental illness.



Step 4: Charting the data

A data charting form was used to record relevant information from each of the included studies and the extracted data were entered into the database programme Excel as follows:

- Author(s), title, year of publication, country of origin
- Sample size, assessment time (week of postnatal period), study methods
- Types and characteristics of assessment tools used to assess postnatal mental illness
- Reliability and validity of the assessment tools

The charting form was tested by two members on a sample from the included studies to ensure that the coding categories were applied consistently. If necessary, the categories were modified, and the charting form was revised accordingly. Questions that arose during this step were discussed by the team and disagreements were resolved through team consultation. The same two members oversaw independent charting of the data from each included study using the coding categories agreed on by the research team. Discrepancies in the extracted data were discussed between the two reviewers until a consensus was reached or by arbitration by a third researcher, if required.

Step 5: Collating, summarising, and reporting the results

A report was produced to summarise the extracted data, which provided information on the types of postnatal mental illnesses assessed by the tools, types of assessment tools used, location and language used in the assessment tools, and their reliability and validity. These results were described in relation to the research question and in the context of the overall study purpose. Gap identification highlighted the most common type of postnatal mental illness that was assessed and the countries with the most research on psychometric properties of postnatal mental illness assessment tools.

Results

A total of 6,028 articles were identified, 5,695 were removed as the titles were unrelated or were not published between 2010 and

2020, 301 abstracts were screened after 31 duplicates were removed, and 207 articles were retrieved for full-text review. Further elimination was performed if the articles did not report on psychometric properties, reliability, or validity of the assessment tools, were not conducted within the first year of childbirth, did not focus on postnatal mothers, were not in English or Malay, or were published as review papers; 59 articles remained. Data were extracted in the data charting form (Appendix 1). A summary of the studies can be found in [Table 1](#).

There were wide variations in the types of assessment tools used for screening of each postnatal mental illness. Several studies validated multiple tools. Therefore, the 59 included articles corresponded to 96 assessment tools for assessing postnatal mental illnesses. From these articles, 2 validated tools were for postnatal blues, 11 for postnatal stress, 12 for postnatal anxiety, 52 for postnatal depression, 5 for the combination of postnatal depression and postnatal anxiety, 4 for postnatal psychosis, and 10 for postnatal psychological disorder.

Out of the 96 tools eligible for inclusion in this review, 7 were utilised in Africa, 24 in Asia, 7 in Australia, 36 in Europe, 20 in North America, and 2 in South America. This observation implies that more research on postnatal mental illness assessment tool psychometric properties was conducted in Western countries compared with Eastern countries.

Table 1. Flow diagram of the search strategy for assessment tools used for postnatal mental illness.

POSTNATAL BLUES							2
INSTRUMENT	AUTHOR (YEAR)	COUNTRY	LANGUAGE	RELIABILITY	VALUE	CRITERIA	NO. OF ARTICLES
Daily Experiences Questionnaire (DEQ)	Buttner et al. (2012)	USA	English	Cronbach's alpha (α)	0.88–0.94	Good–Excellent	1
Maternity Blues Scale (MBS)	Pop et al. (2015)	The Netherlands	Dutch	(α)	0.76–0.87	Adequate–Good	1

POSTNATAL STRESS							11
INSTRUMENT	AUTHOR (YEAR)	COUNTRY	LANGUAGE	RELIABILITY	VALUE	CRITERIA	NO. OF ARTICLES
Acculturative Stress Index	Dennis et al. (2018)	Canada	Not mentioned	(α)	0.93	Excellent	1
Childcare Stress Inventory	Nurbaeti et al. (2019)	Indonesia	Indonesian	(α)	0.74	Adequate	1
Parenting Stress Index (PSI) - Short Form	Gray et al. (2012)	Australia	English	(α)	0.91	Excellent	1
German Parental Stress Questionnaire (GPSQ) - Modified PSI	Anding et al. (2016)	Germany	German	(α)	0.85	Good	2

INSTRUMENT	AUTHOR (YEAR)	COUNTRY	LANGUAGE	RELIABILITY	VALUE	CRITERIA	NO. OF ARTICLES
Swedish Parental Stress Questionnaire (SPSQ) - Modified PSI	Andersson & Hildingsson (2016)	Sweden	Swedish	(α)	0.81	Good	2
Hung Postpartum Stress Scale	Ugurlu et al. (2012)	Turkey	Turkish	(α)	0.93	Excellent	2
	Deltsidou et al. (2018)	Greece	Greek	(α)	0.95	Excellent	
Life Event Questionnaire -Modified	Nurbaeti et al. (2019)	Indonesia	Indonesian	(α)	0.83	Good	1
Perceived Stress Scale (PSS)	Razurel et al. (2013)	Switzerland	French	(α)	0.86	Good	2
	Benediktsson et al. (2017)	Canada	English	(α)	0.88–0.89	Good	
Postnatal Perceived Stress Inventory	Razurel et al. (2013)	Switzerland	French	(α)	0.82	Good	1

POSTNATAL ANXIETY							12
INSTRUMENT	AUTHOR (YEAR)	COUNTRY	LANGUAGE	RELIABILITY	VALUE	CRITERIA	NO. OF ARTICLES
Edinburgh Postnatal Depression Scale (EPDS)	Bina & Harrington (2017)	Israel	Hebrew	(α)	0.60	Poor	2
	Martin & Redshaw (2018)	England	English	(α)	0.74–0.78	Adequate	
Generalised Anxiety Disorder 7 (GAD 7)	Bobevski et al. (2015)	USA	English	(α)	0.85	Good	1
Generalised Anxiety Disorder Questionnaire IV	Pierson et al. (2017)	England	English	(α)	0.82–0.87	Good	1
Hopkins Symptoms Checklist-90-Revised	Nieto et al. (2019)	Mexico	Not mentioned	(α)	0.82	Good	1
Postpartum Specific Anxiety Scale (PSAS)	Fallon et al. (2016)	UK	English	(α) Test-Retest	0.96 0.88	Excellent	1
State-Trait Anxiety Inventory (STAI)	Razurel et al. (2013)	Switzerland	French	(α)	0.95	Excellent	5
	Bayrampour et al. (2014)	Canada	English	(α)	0.84–0.93	Good–Excellent	
	Benediktsson et al. (2017)	Canada	English	(α)	0.93	Excellent	
	Matthies et al. (2017)	Germany	German	(α)	0.91	Excellent	
	Dennis et al. (2018)	Canada	Not mentioned	(α)	0.92	Excellent	
Zung Anxiety Scale	Tran et al. (2011)	Vietnam	Vietnamese	(α)	0.76	Adequate	1

POSTNATAL DEPRESSION							52
INSTRUMENT	AUTHOR (YEAR)	COUNTRY	LANGUAGE	RELIABILITY	VALUE	CRITERIA	NO. OF ARTICLES
Centre for Epidemiological Studies Depression scale (CES-D)	Deltsidou et al. (2018)	Greece	Greek	(α)	0.91	Excellent	1
Edinburgh Postnatal Depression Scale (EPDS)	Chibanda et al. (2010)	Africa	Shona	(α)	0.87	Good	19
	Lau et al. (2010)	China	Chinese	(α) Test-Retest	0.78 0.90	Adequate Excellent	
	Tesfaye et al. (2010)	Ethiopia	Amharic	(α)	0.71	Adequate	
	Banti et al. (2011)	Italy	Italian	(α)	0.75	Adequate	
	Flynn et al. (2011)	USA	English	(α)	0.84	Good	
	Leahy-Warren et al. (2011)	Ireland	English	(α)	0.88	Good	
	Tran et al. (2011)	Vietnam	Vietnamese	(α)	0.75	Adequate	
	Gray et al. (2011)	Australia	English	(α)	0.87	Good	
	Kuo et al. (2012)	Taiwan	Chinese	(α)	0.82	Good	

INSTRUMENT	AUTHOR (YEAR)	COUNTRY	LANGUAGE	RELIABILITY	VALUE	CRITERIA	NO. OF ARTICLES
	Razurel et al. (2013)	Switzerland	French	(α)	0.72	Adequate	
	Bayrampour et al. (2014)	Canada	English	(α)	0.87	Good	
	Gaillard et al. (2014)	France	French	(α)	0.85	Good	
	Clout & Brown (2015)	Australia	English	(α)	0.89	Good	
	Figueiredo et al. (2015)	Brazil	Portuguese	(α)	0.86	Good	
	Giallo et al. (2015)	Australia	English	(α)	0.89	Good	
	Kernot et al. (2015)	Australia	English	Test-Retest	0.92	Excellent	
	Odalovic et al. (2015)	Serbia	Serbian	(α)	0.83	Good	
	Anding et al. (2016)	Germany	German	(α)	0.85	Good	
	Iwata et al. (2016)	Japan	Japanese	(α)	0.81–0.82	Good	
Edinburgh Postnatal Depression Scale (EPDS)	Bina & Harrington (2017)	Israel	Hebrew	(α)	0.71	Adequate	18
	Gollan et al. (2017)	USA	English	(α)	0.87	Good	
	Ing et al. (2017)	Thailand	Burmese	(α)	0.82	Good	
	Ing et al. (2017)	Thailand	Karen	(α)	0.59	Poor	
	Kozinszky et al. (2017)	Hungary	Hungarian	(α)	0.82	Good	
	Matthies et al. (2017)	Germany	German	(α)	0.86	Good	
	Pierson et al. (2017)	England	English	(α)	0.87–0.91	Good–Excellent	
	Bhusal & Bhandari (2018)	Nepal	Nepalese	(α)	0.74	Adequate	
	Delvari et al. (2018)	Iran	Iran	(α)	0.77	Adequate	
	Dennis et al. (2017)	Canada	English	(α)	0.78	Adequate	
	Dennis et al. (2017)	UK	English	(α)	0.86	Good	
	Green et al. (2018)	Kenya	Kiswahili	(α)	0.78	Adequate	
	Martin & Redshaw (2018)	England	English	(α)	0.80–0.82	Good	
	Smith-Nielsen et al. (2018)	Denmark	Danish	(α)	0.82	Good	
	Nurbaeti et al. (2019)	Indonesia	Indonesian	(α)	0.80	Good	
	Nursazila Asikin et al. (2019)	Malaysia	Malay	(α)	0.62–0.78	Poor–Adequate	
	Shwartz et al. (2019)	Israel	Arabic/Hebrew	(α)	0.82	Good	
	Coffman et al. (2020)	USA	English	(α)	0.89	Good	
Patient Health Questionnaire 9 (PHQ 9)	Flynn et al. (2011)	USA	English	(α)	0.85	Good	5
	Bobevski et al. (2015)	USA	English	(α)	0.73	Adequate	
	Green et al. (2018)	Kenya	Kiswahili	(α)	0.81	Good	
	Nieto et al. (2019)	Mexico	Not mentioned	(α)	0.85	Good	
	Coffman et al. (2020)	USA	English	(α)	0.80	Good	

INSTRUMENT	AUTHOR (YEAR)	COUNTRY	LANGUAGE	RELIABILITY	VALUE	CRITERIA	NO. OF ARTICLES
Perinatal Depression Screening (PDEPS)	Green et al. (2018)	Kenya	Kiswahili	(α)	0.77	Adequate	1
Postpartum Depression Screening Scale (PDSS)	Pereira et al. (2010)	Portugal	Portuguese	(α)	0.96	Excellent	8
	Zubran et al. (2010)	Brazil	Portuguese	(α)	0.78	Good	
	Li et al. (2011)	China	Chinese	(α)	0.96	Excellent	
	Lara et al. (2013)	Mexico	Spanish	(α)	0.96	Excellent	
	Lara et al. (2013)	Mexico	Spanish	(α)	0.77–0.80	Adequate–Good	
	Pereira et al. (2013)	Portugal	Portuguese	(α)	0.85	Good	
	Pereira et al. (2013)	Portugal	Portuguese	(α)	0.92	Excellent	
	Blucker et al. (2014)	USA	English	(α)	0.95	Excellent	
POSTNATAL DEPRESSION							5
INSTRUMENT	AUTHOR (YEAR)	COUNTRY	LANGUAGE	RELIABILITY	VALUE	CRITERIA	NO. OF ARTICLES
Edinburgh Postnatal Depression Scale (EPDS)	Cunningham et al. (2014)	Australia	English	(α)	0.87	Good	1
	Torreki et al. (2014)	Hungary	Hungarian	(α)	0.75	Adequate	1
	Bina & Harrington (2017)	Israel	Hebrew	(α)	0.76	Adequate	1
	Martin & Redshaw (2018)	England	English	(α)	0.84–0.85	Good	1
Hospital Anxiety and Depression Scale (HADS)	Grylka-Baeschlin et al. (2015)	Germany	German	(α)	A: 0.75–0.76 D: 0.65–0.75	Adequate Poor–Adequate	1
POSTNATAL DEPRESSION							4
INSTRUMENT	AUTHOR (YEAR)	COUNTRY	LANGUAGE	RELIABILITY	VALUE	CRITERIA	NO. OF ARTICLES
Launay Slade Hallucination Scale	Mannion & Slade (2014)	UK	English	(α)	0.72	Adequate	2
	Holt et al. (2018)	UK	English	(α)	0.66	Poor	
Peters Delusion Inventory	Mannion & Slade (2014)	UK	English	(α)	0.73	Adequate	2
	Holt et al. (2018)	UK	English	(α)	0.73	Adequate	
POSTNATAL DEPRESSION							10
INSTRUMENT	AUTHOR (YEAR)	COUNTRY	LANGUAGE	RELIABILITY	VALUE	CRITERIA	NO. OF ARTICLES
Depression Anxiety Stress Scale (DASS 21)	Clout & Brown (2015)	Australia	English	(α)	D: 0.86 A: 0.79 S: 0.76	D: Good A: Adequate S: Adequate	4
	Meena et al. (2016)	India	Not mentioned	(α)	D: 0.91 A: 0.80 S: 0.90	D: Excellent A: Good S: Excellent	
	Deltsidou et al. (2018)	Greece	Greek	(α)	D: 0.91 A: 0.77 S: 0.82	D: Excellent A: Adequate S: Good	
	Shokuhi et al. (2020)	Iran	Persian	(α)	D: 0.93 A: 0.90 S: 0.91	D: Excellent A: Excellent S: Excellent	
General Health Questionnaire (GHQ 12)	Tran et al. (2011)	Vietnam	Vietnamese	(α)	0.64	Poor	3
	Spiteri et al. (2013)	UK	Maltese	(α) Test-Retest	0.92 0.80	Excellent Good	
	Ngai & Ngu (2015)	Hong Kong	Chinese	(α)	0.74–0.83	Adequate–Good	
Kessler	Tesfaye et al. (2010)	Ethiopia	Amharic	(α)	0.90	Excellent	2
	Tesfaye et al. (2010)	Ethiopia	Amharic	(α)	0.86	Good	
Postpartum Distress Measure Scale (PDMS)	Shokuhi et al. (2020)	Iran	Persian	(α)	0.75	Adequate	1

Reliability and validity of the assessment tools

There were inconsistencies in assessing the validity of the data across the measures, such as concurrent validity, convergent validity, divergent validity, and predictive validity; therefore, a validity coding scheme could not be implemented across the assessment tools. A summary on any evidence of validity presented in the original psychometric papers is presented in Appendix 1.

Reliability data were categorised as adequate, good, or excellent based on the criteria suggested by Hunsley & Mash in 2008. These criteria are reviewed in [Table 2](#).

Table 2. Reliability criteria.

Type of reliability	Criteria	Preponderance of evidence
Internal consistency Cronbach's alpha (α)	Adequate	0.70–0.79
	Good	0.80–0.89
	Excellent	≥ 0.90
Inter-rater reliability kappa (κ) Intraclass correlation (ICC) Pearson correlation (p)	Adequate	κ value 0.60–0.74 ICC or p -value 0.70–0.79
	Good	κ values 0.75–0.84 ICC or p -value 0.80–0.79
	Excellent	κ value ≥ 0.85 ICC or p -value ≥ 0.90
Test-Retest reliability	Adequate	0.70 over a period of several days to several weeks
	Good	0.70 over a period of several months
	Excellent	0.70 over a period of 1 year or longer

Postnatal blues

In this review, only two articles reported on the psychometric properties of assessment tools used to screen postnatal blues: the Daily Experiences Questionnaire (DEQ) and the Maternity Blues Scale (MBS), and both were conducted in Western countries. Although both assessment tools had adequate-to-excellent reliability in these studies, they cannot be suggested as appropriate assessment tools for the screening of postnatal blues in Malaysia as they have yet to be tested in a Malaysian population or setting. The study that utilised the DEQ as its assessment tool used a modified version of the MBS, and the MBS (Dutch version) had modified rating scale to make it suitable for their study setting.

Postnatal stress

A total of 11 studies were identified assessing postnatal stress, with the most used tools being the Parental Stress Questionnaire (PSQ), Hung Postpartum Stress Scale (HPSS), and the Perceived Stress Scale (PSS), which were represented in two articles each. Among these three tools, the HPSS showed the highest reliability, with an excellent Cronbach's alpha range (0.93–0.95).^{16,17} Both the PSQ and HPSS had subscales regarding maternal role attainment, social support, and physical health

problems. The PSS only measured negative emotions and coping capability generally. Based on the current assessment tools used to measure postnatal stress in this review, it can be concluded that these three subscales might be important when developing an assessment tool to measure postnatal stress.

Postnatal anxiety

A total of 12 studies fulfilled the inclusion criteria to be included in this review and all were developed by researchers based on the observations and experiences of Western postnatal mothers; 10 were conducted in Western countries and 2 were conducted in Eastern countries. The reliability criteria of these assessment tools were adequate to excellent in Western countries compared with poor to adequate in Eastern countries. The most used tool to measure postnatal anxiety was the State-Trait Anxiety Inventory (STAI), and all the studies were conducted in Western countries had good-to-excellent reliability.^{18–22} The main subscales used to measure postnatal anxiety in STAI were the State-Trait Anxiety Inventory- State (STAI-S), which measures anxiety state as a temporary condition of a subjective feelings, and the State-Trait Anxiety Inventory- Trait STAI-T, which measures anxiety as a general characteristic.

Postnatal depression

Postnatal depression is the most common postnatal mental illness worldwide. Of the 52 studies included in this review, 37 used the Edinburgh Postnatal Depression Scale (EPDS) as their assessment tool to measure postnatal depression. From this figure, four out of five studies used the EPDS to measure both postnatal anxiety and postnatal depression. The EPDS is the most diverse assessment tool for the postnatal population, with reliability criteria ranging from poor to excellent. In this review, Western countries showed adequate-to-excellent reliability; in contrast, Eastern countries showed poor-to-good reliability. The EPDS has three main subscales: anhedonia, anxiety, and depression, with one question on suicidal ideation and self-harming. The second most popular assessment tool used for postnatal depression is the Postpartum Depression Screening Scale (PDSS). The PDSS also has subscales that are included in the EPDS but uses different points, a Likert scale, and more subscales. In this study, the PDSS showed adequate-to-excellent reliability criteria. The third most common assessment tool is the Patients Health Questionnaire 9 (PHQ 9), which only measures the symptoms of depression with one question on self-harming. It was designed for general use rather than specifically for postpartum patients. The subscales found in the EPDS, PDSS, and PHQ 9 can be considered when developing an assessment tool to measure postnatal depression.

In Malaysia, the most recent study conducted by Nursazila Asikin et al. in 2019 found that the internal consistency of the EPDS (with a cut-off point of 12) was adequate during the first month of the postnatal period (Group 1) with an α value of 0.78; however, this value declined to 0.62 during the period of 1–3 months postnatally (Group 2). Nevertheless, when item 2 was deleted from the tool, the internal consistency of Group 1 increased to 0.85 (good) and the internal consistency of Group 2 increased to 0.71 (adequate). This was the only study conducted in Malaysia in this review, and the findings will be considered when developing an assessment tool appropriate for Malaysian mothers.

Postnatal psychosis

The only study found to measure the psychotic-like experience (PLE) in postnatal psychosis was conducted by Holt et al. in 2018 in the United Kingdom. This study

used two assessment tools, the Launay Slade Hallucination Scale (LSHS) and the Peters Delusion Inventory (PDI), which measure characteristics of psychotic disorders. The LSHS has poor reliability criteria and PDI has adequate reliability criteria. These tools have not yet been used in Malaysian studies, but these items might be necessary for the measurement of postnatal mental illnesses.

Postnatal psychological disorder

This review found four types of assessment tools that were used to measure postnatal psychological disorders: the Depression Anxiety Stress Scale (DASS), the General Health Questionnaire-12 (GHQ 12), Kessler, and a new scale known as the Postpartum Distress Measure Scale (PDMS). These types of assessment tools aim to measure common postnatal mental illnesses, such as stress, anxiety, and depression. The most common tool is the DASS (4 out of 10 studies).^{17, 25–27} The DASS presents adequate-to-excellent reliability criteria in both Western and Eastern countries.

Discussion

A wide variety of assessment tools to assess postnatal mental illnesses were identified; however, several were modified based on the objective of the study, the study population, and the setting. This implies that the assessment tools were locally adapted to improved their reliability and validity. According to Ali et al.¹¹, local validation should be conducted whenever possible to ensure all questions are correctly understood and to ensure better understanding of postnatal mental illness expression and experience, allowing for local idioms to be incorporated into the assessment tools. In the Malaysian National Health and Morbidity Survey report,²⁸ three recommendations were made regarding perinatal mental illness screening. First, it was recommended that the promotion of mental health should be enhanced towards antenatal and postnatal mothers. Second, the HCPs should increase their knowledge and skills regarding perinatal mental health. Third, screening opportunities for postnatal mental illness in healthcare should be explored.

The results of this review showed that the EPDS was the most common assessment tool used to measure postnatal depression; it was also used to measure postnatal anxiety. The DASS was the most common assessment tool used to measure postnatal psychological

disorder. However, the EPDS has poor internal consistency among postnatal mothers in Malaysian population.²⁸ Even though DASS has been shown to have adequate-to-excellent reliability in both Eastern and Western countries, it has not yet been tested in postnatal Malaysian mothers; therefore, it is considered unreliable until validated. Furthermore, both the EPDS and DASS lacked items related to fatigue, appetite disturbances, and decision-making, which are characteristics of depressive mood disorder.

The EPDS, PDSS, PHQ 9, and DASS did not contain items on harming the baby or infanticide. These items may represent a critical omission, as a positive score on this item might indicate postnatal psychosis, which is a psychiatric emergency. Furthermore, current assessment tools used in Malaysia only focus on postnatal depression, while postnatal anxiety and stress have a high comorbidity with depression. A comprehensive assessment tool is required to screen postnatal mental illnesses among mothers that is not only specific to postnatal depression. Not all postnatal mental illnesses need to be screened, as the purpose of screening is to identify people in an apparently healthy population who are at a higher risk of developing a health problem or a condition so that early treatment or intervention can be offered.²⁹

Overall, this review indicated the items generated to assess postnatal mental illness were generated based on the Western woman's experience. The experience of postnatal mental illness is not an experience that is expressed uniformly by woman around the world, possibly due to postnatal mental illness being interpreted differently from one person to another.³⁰ For example, culture and tradition were reported as the factors contributing to postnatal depression among Asian women due to the lack of the empowerment to reject traditional rituals that were imposed on them by their female caregivers.^{31,32} Several features of these traditional rituals may cause tension, stress, and emotional distress. Therefore, using Western-oriented screening tools to detect postnatal mental illness among Malaysian mothers may not be appropriate or equally valid in this population.

In current practice, the nurse and midwife

play an important role in screening and identifying signs and symptoms of postnatal mental illness in postnatal mothers.³³ The Perinatal Care Manual recommends at least nine postnatal visits by the nurse or midwife on days 1, 2, 3, 4, 6, 8, 10, and 15 of postnatal period for normal pregnancy and delivery cases.³⁴ During this visit, women should be asked about their emotional wellbeing, family, and social support in addition to their coping strategies. Any abnormalities identified during these visits may require appropriate referral and additional visits. The WHO recommends that HCPs working within perinatal care provisions be able to assess mental illnesses in women receiving antenatal and postnatal healthcare.³⁵ In summary, HCPs in Malaysia should have the appropriate knowledge, skills, and relevant assessment tools to detect perinatal mental illnesses.

Limitations

This review encompassed literature spanning the 10 years prior to the study to ensure its reliability and relevance to the current healthcare situation. Novel and older studies that were closely related to the research question might have been missed during the literature review process. In addition, only three online databases were used, which might yield limited and biased search results. Geographical and cultural differences may have influenced the study, as the study is one of a kind in Malaysia.

A review protocol was not established for this scoping review. However, the researchers followed the five-step framework proposed by Arksey and O'Malley and the JBI regarding scoping reviews to ensure that the results were rigorous, explicit, transparent, and trustworthy.

Implications for future research and recommendations

Despite the variety of assessment tools available to assess postnatal mental illnesses (e.g., EPDS, PDSS, PHQ 9, DASS, and GHQ 12), they were developed based on the Western woman's experience of postnatal mental illness.^{11,36} An in-depth understanding of the symptoms, experiences, and local idioms of a population is needed to develop an appropriate assessment tool in a diverse ethnic and cultural environment, like that of Malaysia. It is recommended that this assessment tool should be developed by a group of HCPs who are familiar with

postnatal mental illnesses among Malaysian postnatal mothers.

Conclusion

This review has provided information about some of the main assessment tools currently available to measure postnatal mental illnesses. While HCPs recognise the importance of the assessment tools, especially in a primary healthcare setting,¹¹ there are no standard tools available that have been deemed appropriate in a particular population. Because most of the assessment tools were developed based on Western cultures and languages, these scales may lead to inconsistency and inaccuracy when used in a population that differs in not only language and dialect but also in cultural and racial

background; furthermore, these factors greatly influence the perception and interpretation of postnatal mental illnesses. This observation indicates the need for the development of assessment tools for postnatal mental illnesses that are validated within the culture they are evaluating.

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Conflicts of Interest

The authors declare no conflict of interest, financial or otherwise.

How does this paper make a difference to general practice?

- This review consolidates the most common assessment tools used to measure postnatal mental illnesses and their reliability in different populations.
- This review will help the researchers to compare and develop an appropriate tool that can be used to assess postnatal mothers' mental health status in the future.

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REVIEW

Care services for older persons: A scoping review

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Abstract

Introduction: With an increasing life expectancy and proportion of older adults, the number of people in need of care services is also increasing. This study aimed to determine and describe various available care services for older persons reported in literature.

Methods: English-language articles published between the years of 1990 and 2018 in Scopus, ProQuest, PubMed, and Google Scholar databases or search engines were reviewed. The search resulted in 46,927 articles. All selected studies were systematically evaluated and screened based on title, abstract, and full text related to the study's objective. Finally, 246 articles were included in the study. The care services in older persons care systems were identified from the selected articles and were presented in extraction tables. Final conclusions were made based on the types of services provided and their frequency of citation.

Results: The research results showed that numerous systems exist to provide care services for older adults, including long-term care services, home care services, housing for the aged, day care centres, senior centres, nursing homes, and hospice care services. Regarding older adults' care needs and the objectives and missions of each care system, different care services, such as personal care, social support services, medical care services, and nutrition services, have been identified in the service packages.

Conclusion: This study describes the diverse care services available for older persons that have been reported in the literature. Further research in different healthcare systems is required regarding what is most essential and lacking in each setting.

Introduction

The phenomenon of ageing is presently expanding, and the older populations of the world will increase to an expected two billion people by 2050.¹ Currently, Iran is also experiencing a demographic transition, while the population aged 60 years and above has increased from 7.2% in 2006 to 8.2% in 2011²; furthermore, it is anticipated that the older population of Iran will increase from 11 million in 2025 to 30 million in 2050.³ Whereas the growth of the global ageing population is greater in developing countries than in developed countries, these countries, including Iran, have fewer opportunities to confront old age and its consequences.⁴

The cumulative effects of physiological changes during ageing are accompanied by an increase in chronic disorders, diabetes, cardiovascular disease, cancer, osteoporosis, chronic obstructive pulmonary disease, depression, and dementia; with advancing age, the likelihood of developing comorbidities also increases.⁵ The prevalence of disability due to chronic disease is greater among older adults than other age groups, and with the growing older population,

the number of dependent older persons who are in need of regular and continuous care services will increase. Furthermore, an increase in the oldest elderly population is accompanied by an increase in disabilities and a rising demand for long-term care services.⁶ Limitations in resources, reduced income, financial dependency, physical handicaps, social isolation, mental health disorders, including dementia and depression, result in greater vulnerability in these older individuals.⁷

Countries across the world are burdened with the high costs associated with increasing elderly populations and higher incidence of chronic disease.⁸ For example, the highest healthcare costs in low- and middle-income countries are related to heart disease, stroke, visual disorders, loss of hearing, and dementia.⁹ If individuals remain healthy and independent in their old age and without certain impairments, an increase in the older population will not become a social burden; however, if they do not receive the necessary services and support from community, social security systems, and healthcare systems, higher costs will be imposed on families, and providing care for older people

will create limitations for family members to participate in social and educational activities and reduce access to job opportunities.¹⁰ Therefore, various care systems have been developed worldwide with the aim of reducing the negative consequences of ageing and enhancing the health and welfare status of older persons.¹⁰ Various studies indicated that, in less developed countries, the current healthcare systems that provide older adult care services have been inadequately and inefficiently designed.³

Regarding the growing burden of chronic disorders in later life and to ensure productive ageing, comprehensive healthcare and long-term care (LTC) services appropriate to the needs of the older persons should be provided; these services should be readily available and should result in a reduction in the detrimental effects of disease and enhancement of personal health and quality of life.¹⁰ Preventive policies, enhancing healthcare, and immediate treatment of older adults are of great significance.³ To achieve these goals, providing and developing comprehensive and targeted plans based on scientific findings is essential.¹¹

According to a review of the literature, there have been no studies thus far that have evaluated the service packages of various care systems. In addition to identifying the highest priority services in each package, studies in which the relationships between the features of each care system and service recipients were specified were not carried out. This study

was designed and implemented with the aim of identifying various older persons care services and their defined service packages and determining the highest priority services and the mission of each care service.

Methods

This study is a scoping review in which the keywords used were determined based on pilot studies and utilizing a MeSH system. In order to gain access to articles from a search of related studies in databases, keywords with different combinations of (elderly OR aging OR older OR aged OR senior) AND (care OR service) AND (long term care, nursing home, hospice care, extra care housing, sheltered housing, home care, respite care, assisted living, residential facilities, retirement housing, supportive service, senior centre, day care, health services, housing, administration, organization, characteristics, structure, standard) were used. English-language articles published between the years of 1990 and 2018 in Scopus, ProQuest, PubMed, and Google Scholar databases or search engines were reviewed. In addition, the grey literature—which refers to articles that were either unpublished or were published in non-commercial forms (including reports, policy statements, working papers, issues paper, government documents, etc.)—was reviewed. This literature was founded and reviewed from a 'grey literature database' and related governmental or non-governmental departments and agencies that focused on care for older persons.

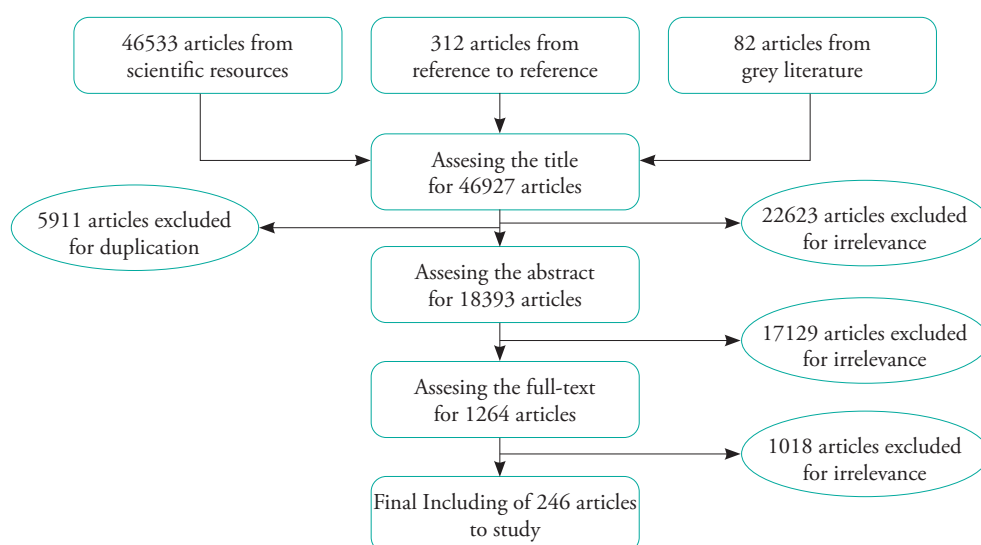


Figure 1. Systematic review approach for searched articles.

In this review, key studies cited in other articles that were related to the aim of the current research were also included. The result of this search was access to 46,927 articles. All studies were systematically analysed based on the relevance of the title, abstract, and full text to the research objectives. Finally, 246 articles were included in this study (Figure 1).

The services provided by each older persons care service were divided into main categories. These categories, which referred to the main care systems' ability to provide delivery of services to older persons, were determined by primary (pilot) search or review. The main categories included personal care, nursing and medical services, social support services, rehabilitation services, and education. In cases where the required services were provided in the articles, they were ranked based on the star system, and the frequency of each service category was separately calculated and arranged in the final table based on the total frequency, in decreasing order. The final conclusions were made based on the types of services provided and their frequencies. The study received ethical permission from the Ethics Committee of Tabriz University of Medical Sciences (IR.TBZMED.REC.1393.250).

Results

Seven main systems of services provided were noted in this review: housing for the aged, home care (HC), LTC, day care centre (DCC), senior centre (SC), nursing home (NH), and hospice care services (HCS). Secondary systems were also referred to by other names, which could be situated in other systems depending on their features and could not be considered separate and independent systems, e.g., supportive services, assisted living, sheltered housing, extra care housing, and housing for the aged; all secondary systems focused on providing housing units for older persons and were categorised as 'housing for the aged'. Of the 246 articles included in this review, 70 were related to LTC services, 43 to HC, 68 to housing for the aged, 17 to DCC, 15 to SC, 11 to NH, and 27 to HCS. Overall, there were three studies common to both LTC and HC and one study common to LTC and DCC, SC, and housing for the aged. Most of the articles included in the review were published between 2000 and 2015 (86%). Over 50% (136) of the articles were related to the USA, over 8% were related to the UK, 7.3% were related to Japan, 5.6% were related to China and Canada (2.8% each), 2.4% were related to Australia, and

10% were related to Germany, Israel, Taiwan, Turkey, and Korea. The remaining articles were related to countries such as Sweden, France, the Netherlands, Spain, Ukraine, South Korea, Finland, Norway, Malaysia, Slovakia, Lithuania, Singapore, and the World Health Organization (WHO). More than 94% of the included articles were original work, 3% were review articles, and 4% were related to reports or documents extracted from grey literature.

Long-Term Care

LTC represents a wide range of community-based services and programmes provided in healthcare centres, homes, day care centres, or institutions; the services maintain and enhance physical performance, individual independence, and quality of life. LTC also includes informal assistance by family members and friends in caring for older persons.¹²

Based on the results obtained from the current study, LTC services included three categories: non-medical services, health-related services, and support services. Non-medical services in LTC included personal care (helping people with activities of daily living [ADL] and instrumental activities of Daily living [IADL]), housekeeping, nutrition services (delivering meals to the home, nutritional consultation, and providing nutritional diets), environment modification (creating a wheelchair ramp, installing auxiliary equipment, and home safety), transportation services, home maintenance, supervision services (full-time supervision by staff, night-time supervision, and relief bells).

Health-related services included medical care (advanced health treatment at home and during daily visits, referral, podiatry, and caring for people diagnosed with dementia), nursing care (periodic evaluation, skilled care services, medication administration, injections, wound dressing, referral, and case management), rehabilitation services (physiotherapy, speech therapy, occupational therapy, visual care services and audiology, and providing rehabilitation equipment), preventive services (screening programmes for illnesses such as depression, periodic assessment), education and consultation services, and other medical care services (hospital services, radiology, laboratory, and oral health services).

Social support services included recreational

and entertainment activities, sports programmes, intergenerational programmes, respite care, financial support to caregivers and group homes for older persons (Table 1).

Table 1. Services covered by LTC, based on the literature review

Included articles	Personal Care	Nursing care	Medical care	Social services	Homemaker services	Rehabilitation services	Nutrition services	Transportation	Home modifications	Education & counselling	Hospice & palliative care	Other medical services	Supervision	Psychological services
General Accounting Office, US	†	†	†	†	†		†	†	†				†	
Pan, S-M	†		†	†		†						†		
Ikegami, et al	†	†		†	†	†								
Doyle A, et al	†		†	†	†	†	†	†				†		
Kane, et al	†		†		†									
Ross MET, et al	†	†	†	†	†		†	†				†		
Hansen, et al		†		†		†	†	†						
Rich ML	†	†	†	†	†	†	†	†		†				
Pacolet, et al	†	†	†	†	†	†	†	†		†	†			
Cuellar, et al	†	†	†	†	†			†						
Feder, et al	†	†	†											
Kodner, et al	†	†	†	†		†	†	†						
Lutzky, et al	†	†	†	†	†	†	†							
WHO	†	†	†	†	†	†			†	†				
Geraedts, et al	†		†	†					†	†				
Brodsky, et al	†	†		†	†	†	†		†		†		†	
LeBlanc, et al	†		†	†	†			†						
Matsuda S, et al		†	†	†		†								
Miller, et al	†	†	†		†									
Borowski, et al	†		†		†			†						
Matsuda S		†	†	†		†								
Kwong EW-Y, et al	†	†	†	†		†	†				†			†
Chan P, et al	†	†	†	†	†	†	†	†		†	†			
United States General Accounting Office	†		†	†	†	†	†	†	†				†	
Chiu H-C	†	†	†	†	†		†	†		†		†		
Mui AC	†		†	†	†		†	†				†		
Wiener, et al	†													
Webb P	†	†	†	†		†				†				
Murashima, et al	†	†		†	†	†								
Comas-Herrera, et al	†	†	†		†									
Brodsky, et al	†	†	†	†	†	†	†	†	†	†	†			†
Palley HA, et al	†		†	†	†		†		†					
Chen Y-M	†	†	†		†	†	†	†	†		†			
Campbell, et al	†	†				†			†					
Mitchell, et al	†	†	†			†			†					
Morris, et al	†		†	†	†	†	†	†	†					
Hansen, et al		†	†					†						
Costa-Font, et al	†			†	†			†						
Huber, et al	†	†	†	†	†	†	†	†	†	†	†		†	
Wu, et al	†			†	†		†	†						†
Gelfand DE	†	†	†	†	†	†	†						†	
Houde, et al	†	†	†			†			†					
Tsutsui T, et al	†	†	†		†	†			†					

Hansen JC		†	†	†	†	†	†	†					†		
Lezovic M	†	†	†	†		†		†	†						
Heinicke, et al	†			†	†		†	†							
Marcinkowska I	†		†	†	†										
Schulz, et al	†	†			†	†									
Rothgang H	†	†		†	†										
Kassner, et al		†			†	†	†							†	
Lehning AJ, et al		†		†			†	†							
Kendig, et al	†	†	†	†	†			†	†						
Guo KL, et al	†	†	†	†	†	†	†				†	†			
Franklin K	†	†	†			†						†			
Yong V, et al	†	†	†	†		†					†				
Iecovich E	†	†	†	†	†										
Olivares-Tirado P, et al	†	†	†			†					†				
Harris-Kojetin, et al	†	†	†	†		†						†			†
Applebaum R, et al	†	†		†	†		†			†	†				
Lee HS, et al	†	†	†	†		†	†								
Igarashi A, et al	†	†		†		†									
Olivares-Tirado, et al		†	†			†				†					
Wysocki A, et al	†	†	†	†	†	†	†	†	†	†	†				
Harris-Kojetin, et al	†	†	†			†						†			†
Igarashi A, et al	†	†				†									
Yang W, et al	†	†					†								
Chin CW, et al		†	†	†								†			
Gonzalez L, et al	†	†	†	†	†	†		†							†
Graham WC, et al	†	†													
Kwak C, et al	†	†			†		†								
Frequency of reference to the type of service	61	55	51	48	42	42	31	28	20	14	14	6	6	6	

A review of the literature in this field indicated that personal care, nursing and medical services, social support services, and housekeeping were the most frequent services provided by LTC. Palliative care, supervision, and psychology services were less frequent in this system. Nevertheless, relative heterogeneity was observed across various service packages.

Home Care

As defined by the WHO, HC includes a set of healthcare and support services provided in homes that can represent a temporary replacement for LTC. These services prevent or delay the hospitalisation of individuals in nursing homes.¹³ The Services available in HC comprised non-medical services, health-related services, and support services.

The non-medical services included personal care (helping older people with ADL and IADL), housekeeping, nutrition services (meal delivery at home, cooking and preparing meals), training classes, transportation, home modification, and home maintenance.

Health services included medical care (home health services, assessment of older adults, therapeutic care planning, providing medical equipment, acute care, and laboratory services), nursing care (setting doctor's appointments, case management, medication administration, wound care, caring for patients with dementia, skilled nursing care, oxygen therapy, dialysis, tube feeding, and parenteral feeding), rehabilitation services (physiotherapy, occupational therapy, and providing rehabilitation equipment), psychology and consultation services, palliative care, and end of life care.

Social support services included family support services, friendly visits, recreational programmes, helping to establish social relationships, accommodations in group housing, providing a home for older adults, helping them find a job, and providing spiritual support (Table 2).

Table 2. Services covered by home care, based on the literature review

Included articles	Nursing care	Personal Care	Medical care	Social services	Homemaker services	Rehabilitation services	Nutrition services	Education & counselling	Transportation	Palliative care	Psychosocial services	Home modifications
Diwan S, et al	†	†	†	†	†	†	†					
Buchanan RJ, et al	†	†	†	†	†	†	†		†		†	†
Haupt BJ, et al	†	†	†	†	†	†	†	†	†			
Stuart M, et al	†	†	†	†	†							
Stuart M, et al	†	†			†	†						
Bentur N		†	†					†				
Wiener, et al	†	†	†	†								
Chan P, et al	†	†	†	†	†	†	†		†	†		
Plumb AM		†			†		†					
Kwong EW-Y, et al	†	†	†	†	†							†
Wallace, et al		†	†	†	†							
Latif E	†	†	†	†	†	†	†					
Perroca MG, et al	†	†	†	†		†		†		†		
Albert SM, et al	†	†			†		†					
Mezey M, et al	†		†	†					†			
Venables D, et al	†	†	†	†	†	†						
Stuart M, et al	†	†	†	†	†	†			†			
Markle-Reid M, et al	†	†	†		†	†						
Hansen JC	†	†	†	†	†		†		†		†	
Cruz M	†	†	†	†			†				†	
Darkins A, et al								†				
Canadian Healthcare Association	†	†	†	†	†	†	†		†	†		†
Forbes DA, et al	†	†	†	†	†	†				†		
Fuhrman MP	†	†	†			†		†		†		
Rabice P, et al	†	†	†	†							†	
Kmpnnpbcgnpbc D, et al			†									
Crossen-Sills J, et al	†							†				
Chang H-T, et al	†		†									
Jones A, et al	†	†	†	†	†	†	†	†	†			†
O'Keeffe, et al		†	†	†								
Bronowski P, et al	†	†	†	†				†			†	
Terrade O, et al			†	†		†				†	†	
Sobis I		†		†			†					
Otaga M	†	†										
Verulava T	†		†	†								
Katahira N, et al	†		†					†		†		
Armstrong JJ, et al	†	†			†	†	†					
Torun N, et al	†		†			†		†				
Fu YY, et al	†	†										
Gümüř R, et al	†		†	†		†	†					
Kiersey RA, et al	†	†		†			†					
Holm SG, et al	†	†				†						
Choi JK, et al	†	†	†	†								
Frequency of reference to the type of service	35	33	32	27	19	18	15	11	9	7	6	4

A review of the previous studies indicated that nursing care, personal care, medical services, social support services, and housekeeping were all priority services provided in HC. The services of palliative care, mental healthcare, and home modification were of lesser significance. Nevertheless, relative heterogeneity was observed across various service packages.

Housing for the Aged

'Housing for the aged' is a broad term that includes all houses considered to be residences of older individuals. Extra-care housing (ECH), which is the common term in England, includes residential units in which special services are provided to support older persons with mental or physical disorders who require nursing services. Assisted living (AL), a term used in the United States, refers to complexes with a residential appearance designed as an environment far from regulations of institutions. Here, care and support services are provided to assist older people who need help in their daily activities, but do not require continuous care and nursing.¹⁴ The available services in housing for the aged included non-medical services, health-related services, and social support care.

Non-medical care in housing for the aged included personal care (assistance regarding ADL and IADL), nutrition services (general nutrition services and providing warm meals based on a menu), home maker services, 'around-the-clock' (i.e., 24-hour) supervision (including remote monitoring, on-site personnel, around-the-

clock assistance), entertainment and group programmes (opportunities to take part in group activities such as playing games, having tea and lunch in groups, shopping inside or outside the complex, sports classes, swimming, or recreational activities), respite care, transportation services, and other services such as repair and maintenance (e.g., furniture, changing of light bulbs) and gardening.

Health-related services included preventive services (infection control, screening, vaccination, and environment modification), medical and nursing care services (visits by the physician, nurse, and other health personnel, intermediate care, medication administration, emergency services, ophthalmology services, supervision of health conditions, control of symptoms, pain management, emergency rescue, helping individuals with cognitive impairments and diabetes treatment, and management of chronic diseases), clinical nutrition services (nutrition education and prescribing a diet), psychological counselling, rehabilitation services (physiotherapy, occupational therapy, and speech therapy), palliative care (pain management and setting up advanced directives), and other healthcare (art therapy, music therapy, pet therapy, respiratory therapy, dance therapy, and chiropody).

Social support services included family support programmes, group and social activities, intergenerational programmes, transportation services, education classes, financial and legal counselling, and help with finding work (Table 3).

Table 3. Services covered by housing for the aged, based on the literature review

Included articles	Personal Care	Nutrition services	Social support	Home maker services	Medical care	Nursing care	Supervision	Transportation	Counselling	Rehabilitation services	Preventive care services	Palliative care	Other therapy	Other services
Just G, et al	†		†	†	†	†	†	†	†					
Mollica, et al	†	†	†	†	†	†	†	†	†	†	†			
Hauser J, et al	†	†	†	†	†			†						
Hawes, et al	†	†		†		†	†							
Mollica, et al	†	†	†	†	†	†	†	†	†		†			
Hawes, et al	†	†		†		†	†	†				†		
Kraditor, et al	†	†	†	†		†	†	†	†	†		†		
Heumann, et al	†	†	†	†	†			†	†					
Habell M	†	†	†	†	†			†	†				†	†

Mulvenna M, et al						†			†					
Kovner CT, et al	†	†	†	†		†	†	†						
Wilden R, et al	†	†	†	†	†	†	†	†						
Sloane PD, et al	†	†		†	†	†						†		
Kovner CT, et al	†	†	†	†	†	†	†							
Mollica R			†		†			†		†				
Salmon JR, et al	†	†	†	†	†					†				
Hawes, et al	†	†		†	†	†		†						
Riseborough M, et al	†		†		†					†				
Wells, Lucy	†			†	†					†				†
Weisman GD, et al	†		†			†								
Chao S, et al	†	†	†		†		†							
Mitty EL	†	†	†	†		†						†		
Hawes C, et al	†	†		†		†	†							
Reynold K	†	†		†										
Wells L	†	†	†		†					†			†	
Care Services Improvement Partnership, UK	†	†			†		†			†				
Wanless, et al		†		†	†		†							
Jones A	†		†	†	†					†				†
Lee JH	†	†	†	†		†	†	†						
National Center for Assisted living	†	†	†	†	†	†	†	†						
Wojgani H, et al	†	†		†			†		†					
Mitty E, et al	†	†		†		†			†					
Hyde J, et al		†			†	†					†		†	
Evans S, et al	†		†		†			†	†				†	
MacLaren C, et al	†	†	†	†	†			†	†	†	†			
Zimmerman S, et al	†	†	†	†	†	†	†	†						
Golant SM	†	†	†	†	†	†		†	†	†	†	†		†
Gelfand, et al	†	†	†	†	†	†		†		†	†			
Darton R, et al			†		†					†				
Tinker A, et al	†	†					†		†					
Wright F, et al	†	†		†			†							
Dutton R	†	†					†		†					
Mitty E						†								
Henning C, et al	†		†		†			†		†				
Sprigg PE	†					†								
Park-Lee, et al	†	†	†						†	†				
Egbu J, et al	†	†					†							
Bow J, Et al.	†								†					
Jenkins R, et al	†	†	†	†	†	†	†	†						
Stachel AG, et al	†		†			†					†			
Allen J	†	†	†			†	†			†				
Heumann LF	†	†	†	†		†	†	†	†	†				
Scharlach A, et al			†	†				†						
Elkins JS	†	†	†	†	†	†	†		†					
Greco M	†	†	†	†	†	†		†		†			†	
Wigfield A, et al									†					
Greenfield EA, et al	†	†	†		†			†						
Camarinha-Matos L, et al	†		†	†	†	†				†	†	†		
Pulkkinen T			†		†				†	†	†			
Memon M, et al					†		†							
Camarinha-Matos LM, et al,	†		†			†	†		†	†	†	†		
Xia B, et al	†	†	†		†									
Wells L	†			†	†				†					†
Kisling A, et al	†	†	†						†					

Iecovich E	†		†	†	†	†								
Kisling-Rundgren A et al	†	†				†			†					
Hu et al	†	†		†	†			†		†				
Writz J, et al	†	†		†				†						
Frequency of reference to the type of service	58	46	42	40	39	34	27	27	24	22	10	7	5	5

A review of the literature indicated that personal care, nutrition services, social support, housekeeping services, medical and nursing care were among the priority services provided in housing for the aged. In some cases, services such as palliative care, rehabilitation services, and preventive services, including environmental modification, screening, and vaccination, were also observed.

Day Care Centres

DCCs represent comprehensive, organised, and community-based programmes designed with various health, social, and support services for responding to the disabled individual's needs. Services are provided at any time of the day (within 24 hours). This type of service was designed for individuals who do not require full time care, to decrease admissions to NHs and LTC centres. The results of the current study indicated that the services available in older persons housing comprised non-medical services, health-related services, and social support care.

Non-medical services included personal care, transportation services, and environment modification. Health-related services included nursing care (healthcare services, case management, medication administration, wound care, injection, oxygen therapy, weight control, blood pressure control, diabetes control, infusion therapy, night-time care, and tube feeding), medical care (medical support, home palliative care at home, chemotherapy, access to a therapeutic team, and radiotherapy), rehabilitation services, psychology services, consultation and education, hospice care, and other therapies.

The social support services of DCCs included family support groups, respite care, consultation, recreational activities, intergenerational programmes, and sports programmes (Table 4).

Table 4. Services covered by day care centres, based on the literature review

Included articles	Social services	Personal care services	Nursing services	Medical services	Rehabilitation services	Education & counselling	Nutrition services	Transportation	Other therapy	Psychological services	Hospice care	Home modification
Copp G, et al	†	†	†	†						†		
Jarrott SE, et al	†	†						†	†			
Williams SE							†					
Higginson I, et al		†	†	†	†			†	†			
The National Council on the Aging	†			†		†						
Cox N, et al	†	†	†	†	†		†	†			†	
Jennings-Sanders A	†	†	†		†	†	†	†				
Gelfand DE	†	†	†	†	†	†	†	†				
O'Keefe, et al	†	†	†	†	†	†						
Alteras T	†	†	†	†	†	†	†			†		
Silverstein, et al	†	†	†		†	†	†	†	†			†
Silverstein NM, et al	†	†	†	†	†	†				†		
Dabelko-Schoeny, et al	†	†	†	†	†	†	†	†	†	†	†	
An Y	†	†	†	†	†	†	†	†	†			
Wei DK, et al	†	†	†	†					†			
Howard R	†	†				†	†	†				
Lin W, et al	†		†		†					†		
Frequency of reference to the type of service	15	14	13	11	11	10	9	9	6	5	2	1

Studies conducted in this area reported that social support services, personal care, medical and nursing care, and rehabilitation services were priority services delivered in the DCCs. In addition, home modification, hospice care, and psychological services were also observed in the service packages of some of these centres.

Senior Centres

SCs are centres in which various programmes and services are provided, such as nutrition programmes, healthcare programmes, art, recreational and volunteer programmes, transportation services, educational classes, helping staff members, intergenerational programmes, group and social programmes, support services for caregivers, social support, and daily care for older persons.

Non-medical services included personal care (helping older adults with ADL and IADL),

nutrition services, transportation, recreational, art and sports programmes, educational classes (cooking and computer), consultation services (financial and legal counselling), and respite care.

Health and fitness services comprised screening programmes (e.g., depression, blood pressure, cancer, vision, hearing, and mammography), daily healthcare, personal training, nutrition services and weight control, special programmes for people with dementia, rehabilitation care, psychology services, personal counselling, and referrals.

The social support services of SCs include intergenerational programmes, cultural programmes, educational classes, support groups and volunteers, respite care, friendly visits, transportation, personal care at homes, and rehabilitation services (Table 5).

Table 5. Services covered by senior centres, based on the literature review

Included articles	Social services	Educational & counselling	Nutrition	Health & fitness services	Transportation	In-home services	Rehabilitation services
Krout JA	†	†	†	†	†	†	†
Feinberg, et al,	†	†				†	
Martin C, et al	†	†	†	†	†		
Skarupski, et al	†	†	†	†	†		
Staicovici S	†	†				†	
Al Mahdy H						†	
Turner, et al	†	†	†	†	†		
Pardasani M	†		†	†			
Gelfand DE	†	†	†	†	†	†	
Krout JA	†	†	†	†	†		
Pardasani, et al	†	†	†	†	†		
Dal Santo TS	†	†	†	†			†
Jellinek I, et al	†	†	†	†	†	†	
Pardasani M, et al	†		†	†			
Pettigrew KA	†	†	†				
Frequency of reference to the type of service	14	12	12	11	8	6	2

Studies conducted in this area showed that social support, training and consultation, nutrition services, fitness, and healthcare were the priority services delivered in the SCs. In some cases, services such as home care and rehabilitation care were also provided.

Nursing Home

This term used in most countries to describe a centre in which support services and nursing are provided in addition to housing services for the older persons who are no longer able to live independently in their houses. Short-term services are also provided to individuals who require

nursing care and help in completing daily activities due to chronic disorders. Skilled care services are also provided for the older persons in specialised centres.¹⁵ The results of the current research indicated that services provided in NHs included non- medical services, healthcare services, and social support services.

Non-medical services comprised personal care (assisting older adults with ADL and IADL), meal delivery, and transportation services.

Health services included nursing and medical services (daily curative care, emergency assistance, chiropody, dialysis, injection, fusion therapy, oral hygiene, and dental care services).

Social support services included family support, respite care, and counselling for older persons and their family members (**Table 6**).

Table 6. Services covered by nursing homes, based on the literature review

Included articles	Medical care	Nursing care	Rehabilitation services	Social services	Personal care	Nutrition services	Hospice care	Transportation	Home maker services
Cates N	†	†	†		†	†			
Ribbe MW, et al	†		†	†			†		
Ishizaki T, et al	†	†	†						
Jones A		†	†	†			†	†	
Rosewarne RC		†		†	†				
Davis JA, et al	†	†	†	†	†	†			†
AARP Public Policy Institute	†	†			†		†		
Chu L-W, et al	†	†		†	†				
Molinari V, et al	†			†					
Kim S-H, et al	†	†	†	†	†				
Day, T	†	†	†		†				
Frequency of reference to the type of service	9	9	7	7	7	2	3	1	1

A review of the related literature showed that medical and nursing services, rehabilitation services, social support services, and personal care were among the highest priority services provided in NHs. In addition, hospice care, home modification, and transportation were also observed in some service packages.

Hospice Care

Palliative care includes care provided to the patient and their family with the aim of enhancing quality of life by predicting, preventing, and treating pain and suffering by responding to emotional, mental, social, spiritual, and physical needs while aiming to maintain the patients independence. Hospice care includes supportive care for patients in the final stages of a disease, to maintain the dignity and quality of life of patients who are in the final stages of their lives; this is achieved through relief and control of unpleasant symptoms. HC services comprised non-medical services, medical services, and social support services.

Health-related services included nursing care (symptom and pain management, medication administration, case management, and providing the required medications), medical services (acute and outpatient care, overall patient assessment, radiology, advanced care planning, providing necessities, and other therapies such as respiratory therapy, music therapy, and message therapy), rehabilitation services (occupational therapy, providing assistive devices and equipment such as walkers and wheelchairs), palliative care services, and psychological services.

Social support included communicating with the patient, supportive counselling, spiritual and palliative consultation, emotional support, respite care, writing wills, support for family caregivers, volunteer services, having sympathy with family members, and bereavement care (Table 7).

Table 7. Services covered by hospice care, based on the literature review

Included articles	Nursing care	Medical services	Social support	Spiritual counselling	Rehabilitation services	Bereavement services	Home maker services	Nutrition services	Personal services	Palliative care	Psychosocial services	Other therapy
Taylor, et al	†	†		†	†	†						
Wiener JM, et al	†	†	†		†	†	†	†	†	†	†	
Haupt, et al	†	†	†	†	†				†			
Miller, et al	†	†	†	†	†	†	†	†				
Glass AP, et al	†	†	†	†	†						†	
Herbst L	†	†	†		†	†			†			†
Chung, et al		†		†	†							
National Quality Forum			†	†		†						
Fine PG, et al	†	†	†	†	†	†	†	†		†	†	
Carlson MD, et al	†	†	†	†	†	†	†	†	†		†	
Harrison JB, et al	†	†			†	†	†	†	†			
Stevenson DG, et al	†	†	†	†	†		†	†	†	†	†	†
Smith MA, et al	†	†	†	†	†	†	†	†	†		†	†
Rich SE, et al	†	†	†	†	†	†	†	†	†			†
Stevenson, et al	†	†		†		†			†			
Batchelor NH	†		†		†	†				†		
Medicare Cf	†	†	†	†	†		†	†				
Jeyaraman S, et al	†											
Lee CY, et al	†	†	†	†	†	†	†				†	
Friebert S, et al	†	†	†	†	†	†	†	†				
Vogel SL	†	†	†	†	†	†		†	†	†		
Littrivis E, et al	†	†	†					†		†	†	
Hutcheson A	†	†	†	†	†	†	†			†		
Sherman DW, et al	†			†			†			†		†
Lester PE, et al		†		†		†						
Verderber S	†	†	†					†		†		
Spiess JL, et al	†		†	†		†						
Frequency of reference to the type of service	24	22	20	20	19	18	13	13	10	9	8	5

A review of the literature indicated that medical and nursing care, social support, spiritual counselling, rehabilitation services, and bereavement care were among highest priority services provided by HC. Personal care and certain therapies, such as music therapy and pet therapy, were also reported in some studies.

Regarding the results of the current study and evaluating care services, the most common care provided to the older people included personal care, social support services, nursing and medical services, nutrition, rehabilitation, housekeeping, transportation, education, consultation, palliative and hospice care, supervision, psychological services, environment modification, home maintenance, and preventive services (Table 8).

Table 8. Most frequently reported services for older persons in the reviewed literature

Included articles	Personal care services	Social support	Nursing care	Medical care	Nutrition services	Rehabilitative services	Home maker services	Education and counselling	Transportation	Hospice and palliative care	Supervision	Home modification	Psychological services	Recreation services	Fitness services	Preventive care services
Housing for the aged	58	42	34	39	46	22	40	24	27	7	27	1	2	-	-	10
Day care	14	15	13	11	9	11	-	10	9	2	-	1	5	-	-	-
Home care	34	28	36	33	15	18	20	11	9	7	-	5	6	-	-	-
Hospice care	10	20	24	22	13	19	13	20	-	9	-	-	8	18	-	-
Long-term care	61	48	55	51	31	42	42	14	28	14	6	20	6	-	-	-
Nursing homes	7	7	9	9	2	7	1	-	1	3	-	-	-	-	-	-
Senior centres	6	14	-	-	12	2	3	12	8	-	-	-	-	-	11	-
Frequency of reference to the type of service	190	174	171	165	128	121	119	91	82	42	33	27	27	18	11	10

Discussion

Nowadays, in developed countries, various care services have been designed and implemented to provide LTC services and to meet the needs of older persons. Regardless of the many similarities between some packages provided by these centres, relative heterogeneity was observed in the services provided by them. This can be due to differences in objectives, subsidiary structures, and the resources available to them. The current research results indicated that housing for the aged, LTC, and HC were among the more diverse and comprehensive services provided, compared with the models.

Housing for the aged, such as AL in the United States and ECH in England, were developed with the aim of helping the older persons to achieve independence, authority, dignity, enhancing social cooperation, and improving quality of life, with emphasis on privacy, having living conditions similar to their home, and ageing in place.^{16,17} These residential care settings are intended mainly for older persons, individuals who are dependent on others, or have medical and nursing needs, and provide tailored person-centred services to respond to the care needs of the individuals.¹⁸ For this reason, a range of services, including personal care, nutrition services, preventive care, and palliative care, are provided in AL and ECH. Whereas the main objective of housing for the aged is to help maintain individuals' independence and quality of life, services such as personal care and housekeeping services are included in most service packages; services such as

medical and nursing care are of second priority.

HC is rapidly expanding in developed countries, with the aim of reducing the healthcare costs of the older persons in hospitals and decreasing their reliance on NHs. HC services are frequently provided to older persons based on medical and nursing needs and the individuals' functional limitations in ADL and IADL.^{13,19} For this reason, a number of services are provided in this structure, including personal care, nursing and medical care, and home modification. One of the special objectives of HC is the prevention of unnecessary hospitalisation and admission to NHs, and services such as medical and nursing care are of higher priority than educational and palliative services.

LTC services are social-based and aim to maintain and enhance physical performance, personal independence, and quality of life.²⁰ Therefore, a range of services are provided in LTC systems, such as rehabilitation services, nutrition services and meals delivery, home modification, and mental health services. The current research findings indicated that LTC services were mainly based on criteria such as age, extent of disability and vulnerability, medical or nursing needs, and individual income.^{21,22} On this basis, services such as personal care and medical and nursing care were included in most service packages.

In developed countries, only older people with severe problems who cannot live at home

are transferred to institutional settings. In Sweden, individuals being treated for chronic disorders, dementia, and severely frail patients are admitted to NHs. In the Netherlands, many NH residents suffer from physical disabilities, dementia, and mental disorders, and they are thus provided with full-time medical and nursing care. Individuals are admitted to a NH after surgery or a severe illness and high-level rehabilitation services are provided.²³ Special units exist in NHs in the United States, such as acute care and a special section for Alzheimer's patients.²⁴

SCs are centres created for enhancing the health and welfare of older persons and encouraging them to participate in recreational activities, group programmes, and health and nutrition programmes.²⁵ Various services such as health and well-being, transportation, and rehabilitation are provided for older persons in SCs. Volunteer groups provide most services in these centres. Among the social support programmes is the family member support programme. As the main goal of SCs is to increase welfare and social participation of older persons, social support services are emphasized.

DCCs are centres in which a series of part-time social support services and personal care is provided. Different models of DCC, such as the social model, health model, and specialised model, were created for different groups of older persons. In the social model, programmes are considered for older persons suffering from physical or cognitive disabilities, and include games, art and handicrafts, and discussion groups. In the health model, which is combined with the social group, nursing services are included in addition to the social model activities. In the specialised model, special services are provided for certain groups, such as older persons diagnosed with dementia, Alzheimer's or mental health disorders.²⁶ Considering that providing services in various DCC units is social-based, and each group focuses on a specific group of older persons, social support services and personal care have higher priority in most service-providing centres.

HSCs represent support care for maintaining quality of life and dignity of patients and their family members.²⁷ Hospice services are provided in various centres, such as NHs, patients' homes, hospitals, special hospice care centres, health service agencies, and

social clinics.^{28,29} The target group of these care services is mainly end-stage patients and individuals with life expectancies of less than 6 months; these individuals and their family members are provided with a series of services, such as spiritual counselling and bereavement care.^{30,31} Considering that hospice services aim to relieve pain and control the unpleasant symptoms of end-stage patients, and also provide mental support for their families, special attention to spiritual counselling and special services for the remaining family members are emphasised. Therefore, medical care, nursing care, and rehabilitation services are of higher priority than other services in these settings. The aforementioned results can be used for prioritising services in case of limitations in resources. LTC and HC services have received more attention in terms of scientific resources, which can be used efficiently to design a proposed model for the care of older persons. Services related to each care system are separately evaluated and reported, and centres providing services for older adults can be proactive in meeting the needs of their recipients based on their priorities and available resources.¹⁰ We believe that the results of this study can represent a guiding point for managers and policy makers in older persons care for the development and implementation of an adequate and evidence-based care structures.

Among the strengths of the current research is the evaluation of a large number of databases and search engines, evaluating the services provided with a division of systems, prioritising the services provided based on their frequency, linking the type and nature of the care system with service recipients, and prioritising identified services. A limitation of this study is that we were unable to determine which care services were most essential but lacking in different healthcare settings; however, we were able to describe the availability of services for older persons as they were reported in the literature. Another limitation is that this study only reported on healthcare services for older persons that were published in the literature and would have excluded many services that were not published.

The results of the current study can represent a beneficial guideline for planners and policy makers in the field of designing older persons care services, based on the identified

priorities, the nature and mission of each older persons care system, and needs of the service recipients. In line with localisation and adaptation of the older persons care model, we suggest that the implementation and significance rate of each of the identified factors be studied and assessed by considering specialist opinions. In addition, it is important to obtain the opinions of the service recipients and beneficiaries and to consider them when defining and implementing the final model. Finally, it is necessary to conduct a pilot test to study the satisfaction rate of service recipients and the implementation rate of the defined package, especially considering cost effectiveness prior to its expansion.

Conclusion

This study described the diverse care services available to older persons that have been reported in the literature. The results can assist in selecting care service systems based on older persons' needs, defining service

packages in care systems based on the availability of resources, and providing the required resources, including manpower, physical space, medical or non-medical devices, and materials based on the defined service package. Further research is required in different healthcare systems regarding which service is most required and lacking in the relative settings.

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Conflicts of interests

The authors declare that there are no conflicts of interests.

Appendix file

The complete reference list can be found at: https://e-mfp.org/wp-content/uploads/RV1221-Care-Services-for-Older_Appendix.docx

How does this paper make a difference to general practice?

- The service package defined in different systems for providing services to the elderly varies according to the nature of the system and the clinical and social needs of elderly.
- This review identified and prioritized different cares provided in various service systems for the elderly.
- Due to the limited resources available to the health system, and considering the importance of improving efficiency and effectiveness in them, the results of this study can be used in selecting the service providing system for the elderly, defining the service providing package, and optimal use of the available resources.

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ORIGINAL ARTICLE

A multi-faceted intervention to improve screening of erectile dysfunction for men with diabetes mellitus in public health clinics: A pilot study

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Abstract

Introduction: Erectile dysfunction (ED) is common in men with diabetes and is associated with coronary artery disease and psychological distress. However, discussion of ED in primary care consultations is uncommon. Interventions, such as audit and feedback, mandate of management, and workshop on men's sexual health, have been proposed to improve ED screening in public health clinics. This study aimed to pilot test a multi-faceted intervention to increase ED screening among men with diabetes and to improve knowledge and confidence in ED screening among primary healthcare providers (PHPs).

Methods: We conducted an interrupted time-series quasi-experimental study with PHPs at public health clinics in Perak, Malaysia from February 2019 to February 2020. Doctors, nurses, and assistant medical officers involved in diabetes care were recruited. The intervention was conducted between July and September 2019 and comprised two phases: audit and feedback, and mandate from management (phase 1), and an interactive face-to-face workshop (phase 2). The primary outcome measure was monthly ED screening rate, and the data were retrieved from health records and the clinical diabetes registry. The PHPs completed a questionnaire on ED knowledge and confidence in ED screening before and after the workshop.

Results: The total number of attendances by patients with diabetes was 50,325 during the study period, of which 21,413 were by men. A total of 30 PHPs participated in the training workshop: 7 (23.3%) doctors, 12 (40%) medical assistants, and 11 (36.7%) nurses. The mean duration of employment at a health clinic was 7 ± 5 years. The majority of the participants were male (56.7%), Malay (80%), married (76.7%), and had no experience with working in a urology department (76.7%). There was a significant improvement in the mean knowledge score (39.0 ± 11.4 vs. 63.6 ± 6.2 , $p < 0.001$) and median confidence level in ED screening from 2 (IQR 2–3) to 4 (IQR 4–4) after the workshop ($p < 0.001$). After phase 1, the rate of ED screening increased from a baseline of between 10.3% (February 2019) and 12.7% (June 2019) before intervention to between 15% (July 2019) and 18.9% (September 2019) and was maintained between 18% (October 2019) and 17.9% (December 2019) after phase 2. Subsequently, the ED screening rate declined from 14.6% (January 2020) to 10.9% (February 2020).

Conclusion: This study found that audit and feedback with mandate from management increased ED screening and detection rate. The workshop improved the participants' knowledge and confidence in ED screening but did not further increase ED screening. The improved practice was sustained for 6 months after the intervention, while the detection rate of ED persisted. We propose regular audit and feedback with mandate from management to sustain the practice of ED screening in men with diabetes.

Introduction

Erectile dysfunction (ED) is a common health problem. In Malaysia, 7 out of 10 men aged over 40 years old in the primary care setting have ED.¹ ED has a significant impact on physical, psychological, and social health. It has been reported that vasculogenic ED is associated with coronary artery diseases;² therefore, ED screening enables the

identification of men with high cardiovascular (CV) risk who require early intervention.³ ED is also associated with depression; one in six men with sexual dysfunction suffers from moderate depressive symptoms.² A meta-analysis indicated that the incidence of depression was three times higher in men with ED than in those without ED.⁴ ED also causes

sexual dissatisfaction, which may lead to marital conflict and impaired quality of life in the family.⁵

Primary healthcare providers (PHPs) are in a strategic position to screen men with diabetes mellitus (DM) for ED. Men with DM were found to be at least three times more likely to develop ED than those without diabetes.⁶ The Princeton III Consensus recommends stratification of CV risk using the Framingham Risk Score for men with vasculogenic ED.⁷ It is recommended that men with vasculogenic ED who are at a high risk for CV events be referred to a cardiologist, while those with intermediate risk who are asymptomatic may consider undergoing further non-invasive evaluation, such as exercise stress testing.⁸

Although ED is common and has significant health implications, it is often overlooked as a health problem among patients and healthcare providers. The reluctance to seek medical advice among men with ED could be due to taboo in discussing sexual issues, embarrassment, and fear of the complications of treatment.⁹ Moreover, most PHPs do not routinely screen for ED. A local study by Tay et al. found that PHPs had poor knowledge and low confidence in ED screening, citing a lack of training as the main reason.¹⁰

Several strategies have been found to be effective in changing PHPs' practice. First, audit and feedback against explicit standards and taking remedial action in areas not achieving those standards have been shown to improve patient care.¹¹ The effectiveness of audit and feedback depends on the baseline performance and how the intervention is delivered.¹¹ Giving feedback in a threatening manner or to PHPs who are high achievers risks eliciting a defensive reaction and leading to burnout.¹² Therefore, motivating PHPs and setting realistic and achievable targets for poorer performers is important when considering the audit and feedback approach to improve care. Second, mandate from management and engaging subordinates in pursuit of common goals can elicit change in practice among PHPs.¹³ Leaders address the subordinates' needs, anticipate their responses, and teach them about the common goals, resulting in increased job satisfaction and productivity.¹³ Third, systematic reviews have shown that certain educational interventions are effective in changing practice behaviour.¹⁴ For example, interactive teaching, such as

workshops and seminars, has been shown to be more effective than didactic methods.¹⁵

Therefore, we designed and conducted a multifaceted intervention—a combination of audit and feedback, mandate from management, and educational workshop on men's sexual health—with the aim of improving ED screening among PHPs in Malaysian public health clinics. The aim of this pilot interrupted time-series study was to evaluate the effectiveness of these three interventions in improving the knowledge, confidence, and practice of ED screening of men with diabetes among PHPs.

Methods

Study design

This was an interrupted time-series quasi-experimental study.

Study setting

A total of 11 public health clinics in the district of Larut, Matang, and Selama (LMS), Perak, Malaysia were involved in the study. Of the 11 health clinics, 4 were located in urban, 2 in suburban, and 5 in rural areas. From February 2019 to February 2020, the 11 health clinics were attended by a total of 50,325 patients with DM, of whom 21,413 were men. There were 94 PHPs in total, including 80 doctors and 14 medical assistants (MAs) or nurses, involved in the management of patients with DM attending the clinics.

Before intervention, there was no usual flow of ED screening at these clinics, and the doctors were the only PHPs verbally screening for ED. Following consultation, the MAs and nurses would retrieve the case notes for the doctors' documentation of ED for follow-up.

Interventions

The intervention to increase ED screening consisted of two phases conducted 2 months apart. During the first phase, an audit and feedback and a mandate from management were conducted simultaneously on July 10, 2019, during a monthly meeting involving 80 doctors from 11 clinics. The meeting was chaired by a district health officer (DHO) who was the public health specialist in charge of clinical key performance indicators (KPI) in the district. Screening of ED for men with DM was one of the KPIs. During the first 25 minutes of audit and feedback session, a family medicine specialist (FMS) presented the audit outcome of ED screening, which included the number of monthly ED screenings among men

with DM and the number of ED cases detected at each health clinic from February to June 2019. The FMS reinforced the importance of ED screening and explained the process of ED screening and the use of validated 5-question International Index of Erectile Function (IIEF-5) for ED screening. The PHPs also discussed the reasons for low ED screening rates, such as time limitation, lack of training, and a lack of PHPs in charge of screening. The DHO then mandated that ED screening be performed for all men with DM, assigned specific PHPs from each clinic to be in charge of documenting the ED screening and detection, and was to be updated every month on the results of the ED screening.

During the second phase, a 1-day workshop on men's sexual health was developed based on literature review and expert discussion with consultant FMSs and psychiatrists on both the content and delivery methods. A workshop with 10–30 participants can lead to a more open and integrated event than a conference; therefore, the workshop was conducted for total 33 PHPs from the 11 clinics in combination.¹⁶ The workshop was conducted by an FMS and a psychiatrist in September 2019 and included short lectures on ED screening, assessment and management, case scenarios, role play, group discussions and presentations, and interactive question-and-answer sessions before and after the workshop. The two outcomes that measured the effectiveness of the interventions encompassed the knowledge and attitude scores of participating PHPs and the screening and detection rates of ED.

Participants of the workshop

We selected 33 of the 94 PHPs from the 11 health clinics who were involved in the management of patients with DM for the phase 2 intervention, and all consented to participate in the study. Each clinic selected three PHPs (a doctor, an MA, and a nurse) who were also part of the clinic's non-communicable diseases (NCD) team.

The PHPs were responsible for the changes in the process of ED screening following the interventions and the implementation of a systematic ED screening process. The ED screening was initiated at the triage counter by the MA or nurse. Men with DM were informed of the ED screening and were provided with a self-administered IIEF-5 questionnaire during waiting time. The questionnaires were collected by the MA

or nurse for documentation upon return. Following screening, the men with ED were referred to the doctor for further management.

Instruments

The participants completed an ED knowledge and confidence questionnaire validated by Tay et al.¹⁰ before and after the workshop, on the same day. The questionnaire was in Malay and English and consisted of demographic data (6 items), ED knowledge (76 items), and confidence on the screening of ED in the public health clinics (1 item). For the knowledge items, there were three response options: 'true', 'false' and 'don't know'. One mark would be scored for each correct response and zero marks for an incorrect or 'don't know' response. The maximum knowledge score was 76. The confidence level in ED screening was evaluated using a 1–5 Likert scale that ranged from 'not confident at all', 'not confident', 'neutral', 'confident', to 'very confident'.

Data collection

The data on the number of diabetic attendances and ED screening and detection rates were documented and entered into a clinical diabetes registry and Microsoft Excel by the MA or nurse during day-to-day practice at the clinics. Data cleaning and compilation were completed monthly by the district chief MA in charge of NCD and the data were stored in thumb drives and e-mails. Confidentiality in the process of data collection was well-preserved as only the district chief MA and FMS in charge of NCD (the principal investigator) could assess the data for the 11 clinics. The data collection for this study was started in June 2019 by the principal investigator for the audit and feedback part of phase 1 intervention. Subsequently, data collection was continued monthly until February 2020 to delineate the year (February 2019 to February 2020) of ED screening and detection.

The PHPs' completed questionnaires on ED knowledge and confidence in ED screening before and after the workshop were collected on the day of the workshop.

Statistical analysis

Statistical analysis was performed using SPSS version 25. All continuous data were plotted as histograms and tested for normality using the Kolmogorov–Smirnov test. Data with normal distribution, such as the knowledge score, are presented as mean with standard deviation; skewed data, such as the confidence

level in ED screening, are presented as median with interquartile range. The PHPs' sociodemographic characteristics are presented as frequency and percentage. The comparison of mean knowledge of ED and confidence in ED screening pre- and post-intervention was performed using a paired t test and Wilcoxon signed-rank test, respectively. The rate of ED screening was analysed using the number of ED screenings as the numerator and attendance of men with DM as the denominator. The rate of ED detection was obtained using the number of men with DM diagnosed with ED after screening as the numerator and the number of ED screenings as the denominator. Level of significance was set at $p < 0.05$.

Ethical considerations

The study was registered with the National Medical Research Registry (NMRR-19-2618-50697). The approval to execute this study was obtained from the Medical Research Ethics Committee (MREC), Ministry of Health

Malaysia, and the District Health Office of Larut, Matang and Selama, Taiping, Perak. Written informed consent was obtained from all participants.

Results

Sociodemographic data of workshop participants

The workshop participants comprised 33 out of the 94 PHPs involved in NCD at the 11 public health clinics in the district of LMS, Taiping. The response rate was 35.1%. We received 30 completed questionnaires from 7 (23.3%) doctors, 12 (40%) medical assistants, and 11 (36.7%) nurses. The mean age of the participants was 34.8 ± 7.3 years. Most of the participants were male (43.3%), married (76.7%), assistant medical officers (40%), and of Malay ethnicity (80%). Most participants had no employment experience in a urological department (76.7%) and the mean duration of work experience at health clinics was 7 ± 5 years (Table 1).

Table 1. Sociodemographic characteristics of participants attending the men's sexual health workshop (N=30).

Domains	Total	Doctor	MA	Nurse
Age (years) (mean $\pm$ SD)	34.8 $\pm$ 7.3	32.4 $\pm$ 4.7	32.3 $\pm$ 7.9	39.2 $\pm$ 6.4
Gender (n %)				
Male	17 (56.7)	5 (71.4)	12 (100)	0 (0)
Female	13 (43.3)	2 (28.6)	0 (0)	11 (100)
Ethnicity (n %)				
Malay	24 (80.0)	4 (57.1)	10 (83.3)	10 (90.9)
Chinese	2 (6.7)	2 (28.6)	0 (0)	0 (0)
Indian	4 (13.3)	1 (14.3)	2 (16.7)	1 (9.1)
Marital Status (n %)				
Single	7 (23.3)	2 (28.6)	4 (33.3)	1 (9.1)
Married	23 (76.7)	5 (71.4)	8 (66.7)	10 (90.9)
Years Working at Health Clinic (mean $\pm$ SD)	7.0 $\pm$ 5.0	5.4 $\pm$ 5.1	6.3 $\pm$ 4.7	8.9 $\pm$ 5.2
Previous Experience in Urological Posting (n %)				
Yes	7 (23.3)	4 (57.1)	1 (8.3)	2 (18.2)
No	23 (76.7)	3 (42.9)	11 (91.7)	9 (81.8)

IQR: interquartile range MA: medical assistant SD: standard deviation

Knowledge score and confidence level in erectile dysfunction screening before and after the workshop

Before and after the workshop, the doctors achieved the highest knowledge scores; however, there was no difference in the median of confidence level in ED screening among the three groups of participants (Table 1). The mean knowledge score was 39.0 ± 11.4 and 63.6 ± 6.2 before and after the workshop, respectively ($p < 0.001$). The median confidence level increased significantly from 2 (IQR 2–3) to 4 (IQR 4–4) after the workshop ($p < 0.001$) (Table 2).

Table 2. Knowledge score and confidence level in erectile dysfunction (ED) screening before and after the men's sexual health workshop (N=30).

Variables	Pre-workshop	Post-workshop	t statistic (df) 95% CI	Z statistics	p value
Knowledge Score Mean (SD)	39.00 (11.40)	63.57 (6.24)	14.629 (29) 21.132–28.001		<0.001*
Doctor	45.1 (13.3)	66.9 (6.7)			
MA	36.8 (10.8)	62.3 (3.3)			
Nurse	37.5 (10.4)	62.8 (8.0)			
Confidence Level Median (IQR)	2 (2, 3)	4 (4, 4)		-4.736	<0.001*
Doctor	2 (2, 4)	4 (4, 5)			
MA	2 (2, 3)	4 (4, 4)			
Nurse	2 (2, 3)	4 (4, 4)			

*Paired t-test

#Wilcoxon signed-rank test

CI: confidence interval

Screening of erectile dysfunction among diabetic men

In the pre-intervention phase from February to June 2019, the attendance of men with DM ranged from 29.1% (n=1562) to 25.2% (n=1353), and the rate of ED screening ranged from 10.3% (n=161) to 12.7% (n=172). After the audit and feedback with mandate from management (phase 1) on 10 July 2019, the ED screening rate increased, ranging from 15% (n=282) in July 2019 to 18.9% (n=273) in September 2019. After the interactive face-to-face workshop (phase 2) on 26 September 2019, the ED screening rate was maintained, ranging from 18% (n=335) in October 2019 to 17.9% (n=317) in December 2019. The ED screening rate subsequently decreased, ranging from 14.6%

(n=219) in January 2020 to 10.9% (n=195) in February 2020. (**Figure 1 & Table 3**)

Detection rate of erectile dysfunction

Prior to the intervention, the detection rate of ED among men with DM ranged from 2% (n=4) in February 2019 to 6.4% (n=11) in June 2019. There was 4–5-fold increase in the detection rate of ED after phase 1, and it remained static after the phase 2 intervention. After the phase 1 intervention, the detection rate of ED increased from 24.8% (n=70) to 27.1% (n=82) and 21.6% (n=59) in July, August, and September 2019, respectively. After the workshop (phase 2), the detection rate of ED ranged from 17.9% (n=60) in October 2019 to 26.2% (n=51) in February 2020 (**Figure 1 & Table 3**).

Table 3. ED screening and detection rates among men with diabetes mellitus (DM) before and after the phase 1 and 2 interventions.

Phases	Date	Attendance of men with DM, n (%)	ED Screening, n (%)	Men with DM diagnosed with ED after screening, n (%)
Pre-intervention	Feb 2019	1562 (29.08)	161 (10.31)	8 (4.97)
	Mar	1744 (32.47)	193 (11.07)	8 (4.15)
	Apr	1894 (35.26)	203 (10.72)	4 (1.97)
	May	1281 (23.85)	132 (10.30)	9 (6.82)
	June	1353 (25.19)	172 (12.71)	11 (6.40)
Audit & Feedback, Mandate of Management: July 10, 2019 (phase 1)	July	1880 (35.00)	282 (15.00)	70 (24.82)
	Aug	1459 (27.16)	303 (20.77)	82 (27.06)
Workshop: Sept 26, 2019 (phase 2)	Sept	1445 (26.90)	273 (18.89)	59 (21.61)
	Oct	1866 (34.74)	335 (17.95)	60 (17.91)
	Nov	1856 (34.56)	347 (18.70)	51 (14.70)
	Dec	1775 (33.05)	317 (17.86)	44 (13.88)
	Jan 2020	1504 (28.81)	219 (14.56)	65 (29.68)
	Feb	1794 (34.37)	195 (10.87)	51 (26.15)

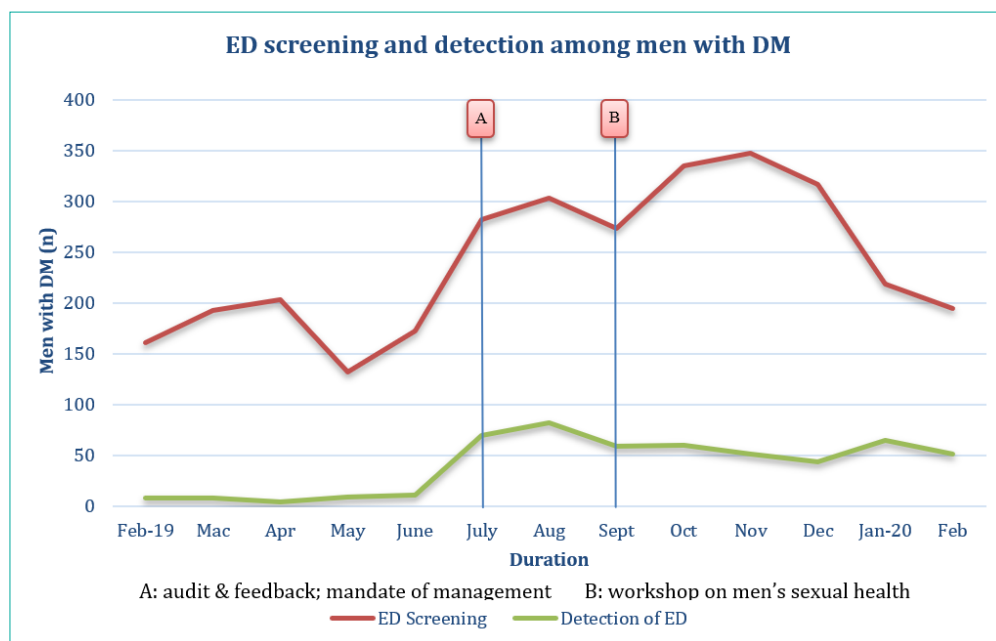


Figure 1. Impact of phase 1 and 2 interventions on ED screening and detection among men with DM.

Discussion

In this study, ED screening among men with DM increased drastically after the first phase of intervention (audit and feedback with mandate from management). The audit and feedback session was delivered with a tangible action plan for improvement where the PHPs were empowered to use the validated IIEF-5.¹² The proper utilisation of the IIEF-5, which was not used before audit and feedback, was likely to have contributed to the increased detection rate of ED due to its high sensitivity (97%) and specificity (88%).¹⁷ Self-administering the IIEF-5 during waiting time at the clinic may overcome some barriers in ED screening, such as limited consultation time, embarrassment, and reluctance of patients to discuss sexual health candidly.¹⁸ In addition, using the validated IIEF-5 in Malay as an objective ED screening tool can improve documentation and avoid 'failure to diagnose'.¹⁹

Health priority, directives, and support from higher authorities are some of the key facilitators for effective implementation of a clinical interventions.²⁰ The mandate from the DHO, who was the key performance indicator (KPI) assessor, had a direct effect on the PHPs' practice in ED screening.²⁰ PHPs were reminded that ED screening is part of KPIs in the NCD programme. Assignment of specific doctors and paramedics in each clinic to be in charge of the ED screening audit by the DHO created a sense of responsibility.¹³ The mandate from the DHO was continuous,

but there were no regular meeting sessions with the PHPs to discuss issues regarding ED screening. PHPs are burdened with implementing many programmes and KPIs from time to time, which may have resulted in the screening rate declining to baseline levels after the intervention. Barriers to ED screening, such as lack of encouragement by colleagues or superiors, cannot be remedied by educational intervention; instead, motivation and incentives should be considered.²¹ For example, showing appreciation for the highest achiever in ED screening by awarding a certificate or providing extra allowances may serve as a motivation.

The 1-day interactive workshop on men's sexual health improved healthcare providers' knowledge and confidence in ED screening. This observation was similar to a study conducted in Australia, where they found that a 2-day workshop on evidence-based practice improved the knowledge and confidence in evidence-based practice among occupational therapists.²² Educational workshops can be an important intervention to improve the quality of ED screening and management; however, this study did not find any improvement in the number of ED screenings conducted after the workshop. This was likely due to the heavy workload at the public health clinic and the ceiling effect after the phase 1 intervention when the participants had already received some education on ED screening.²³ A similar study in Australia found a lack of behavioural changes after an educational intervention.²²

The rate of ED screening started to decline 6 months after the first phase of intervention and 3 months after the workshop (phase 2); this was likely due to the lack of follow-up structural feedback, reinforcement of mandates from the management, and a refresher workshop to sustain the implementation. A Canadian mixed-method study showed that physicians' behaviours related to the practice of evidence-based medicine could be improved through a 1-day workshop, with sustained improvement observed 3–6 months later.²³ An Iranian study on educational interventions reported the change in behaviour persisting up to 3 months after the intervention, but decreasing over time.²⁴ There is a need for regular intervention at 6-month intervals to refresh knowledge until PHPs fully understand the benefits of ED screening or until the PHPs enter the maintenance stage of behavioural changes. This is compounded by staff turnover in addition to diminishing motivation. Our study indicated that the combined 40-minute audit and feedback with mandate from management (phase 1) may be more effective than the 1-day workshop (phase 2) in sustaining the ED screening. Further studies are needed to confirm this observation.

This was the first pragmatic study to assess the real-world practice of ED screening of men with DM in a Malaysian public health clinic setting. This study has provided the opportunity to conduct more definitive trials in the future to determine the impact of each component of this multi-faceted intervention so that a more sustainable screening programme can be incorporated into the clinic system.

There were several limitations in this study. First, the phase 1 intervention comprising audit and feedback with mandate from management was conducted simultaneously for logistic reasons; therefore, the exact impact of each component on the practice of ED screening

could not be differentiated. In addition, important patient-reported outcome measures, such as patient satisfaction, were not evaluated. There were some confounding factors that might have influenced the ED screening after intervention. The movement control order during the COVID-19 pandemic may have lowered the priority for screening for ED among men with diabetes. Mobilisation of PHPs from diabetes care to front-line teams for COVID-19 sampling centres, assessment centres, and vaccination centres may have reduced the manpower available for ED screening. A staff transfer rate of about 10% each year may have also influenced the ED screening rate.

Audit and feedback with mandate from management were strategies that improved ED screening for up to 6 months in public health clinics. A 1-day interactive workshop focusing on men's sexual health increased healthcare providers' knowledge on ED and their confidence in ED screening but did not further increase the practice of ED screening. Future studies evaluating each component of the interventions, the effectiveness of the phase 2 intervention when more PHPs were trained or changing the order of each component may help to further improve or streamline the multi-faceted intervention. We recommend a regular (every 6 months) audit and feedback, and mandate of management to sustain the practice of ED screening in men with diabetes.

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Conflicts of interest

No conflicts of interest are declared.

How does this paper make a difference to general practice?

- This research indicated that audit and feedback in addition to mandate from management at regular 6-month intervals can sustain the practice of ED screening by PHPs in public health clinics.
- The workshop on men's sexual health improved the knowledge of ED and confidence in ED screening but did not further increase the number of ED screenings among the healthcare providers.
- Future research evaluating each component of the multi-faceted intervention is necessary to identify the key component to making the ED screening intervention effective.

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ORIGINAL ARTICLE

Factors influencing pap smear screening uptake among women visiting outpatient clinics in Johor

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Abstract

Introduction: Despite the benefits of cervical cancer screening, Pap smear uptake remains variable in Malaysia, with Johor previously reported as the state with the lowest uptake. This study aims to fill the gap in epidemiological knowledge and assess factors affecting the uptake of Pap smear screening among women in Johor.

Methods: A cross-sectional study was conducted in several government and private clinics across Johor, including Pagoh, Muar, Batu Pahat, Kulai, and Johor Bahru districts. Data was collected from 452 women using self-administered questionnaires, and logistic regression was performed to determine factors associated with Pap smear uptake.

Results: Findings showed that 48.5% of the women reported having undergone Pap smear screening in the previous 3 years, and 40.0% and 51.3% of respondents accurately answered questions on symptoms and risk factors of cervical cancer, respectively. Increasing age (OR_{adj} 2.322, 95% CI 1.708–3.158), being married (OR_{adj} 4.860, 95% CI 1.100–21.476), parity of ≥ 5 (OR_{adj} 8.381, 95% CI 1.326–52.958), young age at first pregnancy (OR_{adj} 0.932, 95% CI 0.877–0.991), knowledge of cervical cancer symptoms (OR_{adj} 1.745, 95% CI 1.065–2.857), support from family (OR_{adj} 3.620, 95% CI 2.081–6.298), and contraception use (OR_{adj} 2.220, 95% CI 1.314–3.750) were significantly associated with increased Pap smear uptake among women visiting outpatient clinics in Johor.

Conclusion: Pap smear uptake remains suboptimal in Johor, and broad-based awareness campaigns tailored towards improving knowledge of cervical cancer with family involvement are crucial to improving uptake among women in Johor.

Introduction

Cervical cancer is the fourth most common cancer among women both worldwide and in Malaysia.¹ The incidence of cervical cancer in Malaysia was 10.2 per 100,000 people in 2020, and a majority of these cases were diagnosed at late stages.² The Ministry of Health Malaysia reported an average of 2,000–3,000 hospital admissions for cervical cancer cases per year, with over RM50 million annual expenditure, and most of the funds were utilised for advanced-stage cases.³

Preventative actions for cervical cancer include the primary prevention approach of human papillomavirus (HPV) vaccination and secondary prevention that includes screening and treatment of precancerous lesions. The Pap smear is a safe, simple, and cost-effective screening tool for detection of precancerous and malignant cervical epithelial lesions.

Precancerous cervical lesions often progress slowly and asymptotically to invasive cancer, and these lesions can successfully be detected by a Pap smear. Pap smear was reported to be effective in reducing cervical cancer incidence by 30–78% in countries with proper implementation of screening programmes.⁴

Despite its clear benefits, Pap smear screening uptake has remained suboptimal since its introduction in Malaysia in 1969. Local guidelines recommend Pap smear screening in all women who are or had been sexually active between the ages of 20 and 65 years,⁵ with free Pap smear screening tests provided at all government health facilities since 1995 as a national health initiative.⁶ A study conducted in 57 countries reported a screening coverage of only 19% in developing countries, including Malaysia, compared with 63% in developed countries, which falls largely below the 70%

target set by the World Health Organization (WHO).⁴

The 5th National Population and Family Survey reported Johor as the state with the lowest Pap smear screening uptake at 39.9%,⁷ and Pap smear uptake nationwide had fallen to 36.6% in the latest National Health and Morbidity Survey in 2019.⁸ Local studies have likewise reported low Pap smear uptake ranging from 25% to 46%, with a majority of these studies focusing on Peninsular Malaysia, particularly Selangor and Kuala Lumpur.^{9–13} Lack of knowledge was the most common barrier among participants in these studies, and other barriers, including limited healthcare access, education, and anxiety, were also reported to influence Pap smear uptake.^{9–14}

There is a clear lack of studies investigating factors associated with Pap smear screening uptake in the southern regions of the Peninsula, including Johor, and this study was conducted to address this issue. Identification of these factors may provide valuable information to improve education and screening programmes for the community to increase Pap smear screening and, in turn, ensure earlier detection and treatment of cervical cancer.

Methods

Study design and population

A cross-sectional study was conducted in several government and private clinics across Johor, including the districts of Pagoh, Muar, Batu Pahat, Kulai, and Johor Bahru. The study participants consisted of consenting female patients aged 18 to 65 years who attended the outpatient clinics, were or had been married, and who were able to understand English or Malay. Patients diagnosed with cervical cancer, foreigners, and patients with acute and severely ill presentations were excluded from participation. Respondents were recruited using convenience sampling between June 2019 and August 2019.

Sample size determination

The sample size was calculated using the single proportion formula at 95% confidence interval with a 5% margin of error and an estimated proportion of 39.9% Pap smear uptake in the Johor population.⁷ A final sample size of 443 subjects was calculated for this study, taking into consideration a 20% non-response rate.

Study procedure

Data collection was performed using

self-administered questionnaires and anthropometric measurements. Prior to the questionnaire, all respondents were provided with a written and oral explanation of the purpose and methodology of the research and assurance of confidentiality. Respondents were also assured that participation was voluntary, and that they could refuse to participate at any time during the questionnaire, without any effect on the treatment they were seeking in the clinic. Written informed consent was obtained prior to administration of the questionnaire, and no identifiable information was collected.

Study instrument

The bilingual (English and Malay language) questionnaire used in this study was pretested and utilised in a prior local study in 2013,¹⁴ and permission for its use was obtained from the lead author in 2018. The questionnaire covered sociodemographic factors, reproductive history, lifestyle behaviour, knowledge of cervical cancer symptoms, knowledge of cervical cancer risk factors, and attitude towards Pap smear cancer screening. Occupational status was denoted as 'professional' if the occupation required specialised knowledge and skills (e.g., teachers, lawyers), and 'non-professional' if the job scope was largely repetitive or manual (e.g., cashiers or food workers). Knowledge was assessed by multiple-choice questions regarding the symptoms and risk factors of cervical cancer, with participants being graded as 'correct' in a particular domain if they chose the correct answer. Health attitude was assessed using questions regarding the source of the participants' information on cervical cancer, contraception practices, willingness to have a male doctor perform the Pap smear, and the choice of family and social support in case of symptoms.

Data analysis

Data analysis was performed using SPSS software version 16.0 for Windows. Categorical data, such as ethnicity and marital status, are presented as frequency and percentages. Simple logistic regression analysis was conducted to test for factors associated with Pap smear screening uptake with a 95% confidence interval. Variables with a p-value less than 0.25 in the univariate analysis were subsequently included in the multiple logistic regression model for further analysis to determine significant association with Pap smear uptake. The results are presented as adjusted odds ratio (OR_{adj}), and a p-value of less than 0.05 was considered statistically significant.

Ethical considerations

Ethical approval was obtained from the Medical Research and Ethics Committee (MREC), National Institute of Health Malaysia (NMRR-19-105-45960).

Results

A total of 456 women were approached for the survey, and 452 women participated, with a response rate of 99.1%. The mean age of the respondents was 37.7 ± 11.5 years. Most participants were of Malay ethnicity (79.4%), had secondary education (50.4%), were married at the time of the study (87.6%), had

a non-professional occupation (41.4%), and had a monthly personal income of less than RM2500 (63.3%) (Table 1). The mean age at first pregnancy was 20.9 ± 10.0 years, with most participants reporting a parity ranging between one and four. The respondents predominantly did not have underlying chronic medical illnesses (69.7%), were obese (36.3%), and did not perform regular physical activity (55.5%) (Table 1).

Of the 452 women involved in the study, 219 (48.5%) reported having undergone Pap smear screening in the previous 3 years.

Table 1. Sociodemographic characteristics of respondents (N=452).

Characteristics	N (%)
Age group (years)	37.7 ± 11.5
<20	7 (1.5)
20–29	126 (27.1)
30–39	134 (29.6)
40–49	91 (20.1)
50–59	83 (18.4)
≥60	11 (2.4)
Ethnicity	
Malay	359 (79.4)
Chinese	53 (11.7)
Indian	31 (6.9)
Other	9 (2.0)
Education level	
No education or primary education	67 (14.8)
Secondary education	228 (50.4)
Tertiary education	157 (34.8)
Marital status	
Married	396 (87.6)
Divorced or widowed	56 (12.4)
Occupational status	
Professional	89 (19.6)
Non-professional	187 (41.4)
Not working	176 (39.0)
Monthly personal income	
<RM2500	286 (63.3)
RM2500–RM5000	115 (25.4)
>RM5000	51 (11.3)
Parity	
Nulliparous	73 (16.2)
1–4	284 (62.8)
≥5	95 (21)
Age at first pregnancy (years)	20.9 ± 10.0
Nulliparous	75 (16.6)
<20	34 (7.5)
20–29	293 (64.8)
30–39	49 (10.8)
≥40	1 (0.2)
Chronic medical illness	137 (30.3)
BMI	
Underweight	26 (5.8)
Normal	114 (25.2)
Overweight	148 (32.7)
Obese	164 (36.3)
Regular exercise	201 (44.5)

Approximately 40.0% and 51.3% of respondents were able to correctly answer the questions pertaining to the symptoms and risk factors of cervical cancer, respectively (Table 2). Most women in the study received information on Pap smears from government healthcare services (60.2%), with 59.1% of respondents receiving support from their family to undergo a Pap smear. The participants were predominantly unwilling to undergo a Pap smear with a male doctor (80.1%), cited their husbands as the first person to approach in the presence of symptoms (67.5%), needed moral support (52.7%), and did not practice contraception (67.5%) (Table 2).

Table 2. Knowledge and behavioural patterns of respondents (N=452).

Characteristics	N (%)
Knowledge of cervical cancer symptoms	
Correct answers	181 (40.0)
Postcoital bleed	66 (14.6)
Abnormal vaginal discharge	60 (13.3)
Intermenstrual bleed	44 (9.7)
No symptoms	11 (2.4)
Incorrect answers	271 (60.0)
No menstruation	62 (13.7)
Others (pruritus, increased abdomen size)	8 (1.8)
Did not know	201 (44.5)
Knowledge of risk factors of cervical cancer	
Correct answers	232 (51.3)
Family history	141 (31.2)
Multiple sex partners	91 (20.1)
Incorrect answers	220 (48.7)
Uncircumcised partner	5 (1.1)
Other (surgery, fatty diet)	7 (1.8)
Did not know	208 (46.0)
Sources of information on Pap smear	
Never received information	61 (13.5)
Government healthcare	272 (60.2)
Private healthcare	23 (5.1)
Family or friends	39 (8.7)
Campaigns or mass media	31 (6.8)
Magazines or brochures	26 (5.8)
Support from family to undergo Pap smear	
Yes	267 (59.1)
First person to approach if symptomatic	
Nobody	44 (9.7)
Husband	305 (67.5)
Mother or sibling	85 (18.8)
Friends	3 (0.7)
Others	15 (3.3)
Requiring support if symptomatic	
None	50 (11.1)
Moral support	238 (52.7)
Physical support	94 (20.8)
Informational support	67 (14.8)
Others	3 (0.6)
Contraception	
None	305 (67.5)
Oral contraceptive pill	73 (16.2)
Injection	33 (7.3)
IUCD	15 (3.3)
Barrier	11 (2.4)
Others	15 (3.3)

Following multivariate analysis, older age (OR_{adj} 2.322, 95% CI 1.708–3.158), being married (OR_{adj} 4.860, 95% CI 1.100–21.476), parity ≥ 5 (OR_{adj} 8.381, 95% CI 1.326–52.958), young age at first pregnancy (OR_{adj} 0.932, 95% CI 0.877–0.991), knowledge of cervical cancer symptoms (OR_{adj} 1.745, 95% CI 1.065–2.857), support from family (OR_{adj} 3.620, 95% CI 2.081–6.298), and contraceptive use (OR_{adj} 2.220, 95% CI 1.314–3.750) were significantly associated with increased Pap smear uptake among women in Johor (Table 3).

Table 3. Factors associated with Pap smear uptake among women in Johor.

VARIABLES	PAP SMEAR UPTAKE		Crude OR (95% CI)	p-value	Adjusted OR (95% CI)	p-value
	Yes N (%)	No N (%)				
Age (years)	37.7 ± 11.5		1.095 (1.073–1.118)	<0.001	2.322 (1.708–3.158)	<0.001
Ethnicity						
Malay	174 (48.5)	185 (51.5)	ref			
Chinese	31 (58.5)	22 (41.5)	1.498 (0.835–2.687)	0.175	1.617 (0.745–3.508)	0.224
Indian	11 (35.5)	20 (64.5)	0.585 (0.272–1.256)	0.169	0.674 (0.251–1.804)	0.432
Other	3 (33.3)	6 (66.7)	0.532 (0.131–2.159)	0.377	0.462 (0.089–2.388)	0.335
Education level						
No education or primary education	24 (35.8)	43 (64.2)	ref	0.056		
Secondary education	112 (49.1)	116 (50.9)	0.578 (0.329–1.015)	<0.001	1.164 (0.579–2.342)	0.670
Tertiary education	97 (61.8)	60 (38.2)	0.345 (0.191–0.625)	<0.001	0.950 (0.415–2.172)	0.903
Marital status						
Married	215 (54.3)	181 (45.7)	15.442 (5.48–43.515)	<0.001	4.860 (1.100–21.476)	0.037
Divorced or widowed	4 (7.1)	52 (92.9)				
Occupational status						
Professional	33 (37.1)	56 (62.9)	0.631 (0.374–1.063)	0.084	1.048 (0.515–2.130)	0.898
Non-professional	101 (54.0)	86 (46.0)	1.257 (0.832–1.899)	0.277	1.680 (0.993–2.841)	0.053
Not working	85 (48.3)	91 (51.7)	ref			
Monthly personal income						
<RM2500	138 (48.3)	148 (51.7)	ref			
RM2500–RM5000	53 (46.1)	62 (53.9)	0.917 (0.594–1.415)	0.695		
>RM5000	28 (54.9)	23 (45.1)	1.306 (0.718–2.375)	0.382		
Parity						
Nulliparous	11 (15.1)	62 (84.9)	ref			
1–4	137 (48.3)	147 (51.7)	5.253 (2.655–10.391)	<0.001	4.809 (0.724–31.955)	0.104
≥5	71 (74.7)	24 (25.3)	16.674 (7.562–36.769)	<0.001	8.381 (1.326–52.958)	0.024
Age at first pregnancy (years)	20.9 ± 10.0		1.796 (1.423–2.269)	<0.001	0.932 (0.877–0.991)	0.024
Chronic medical illness						
Yes	93 (67.9)	44 (32.1)	3.170 (2.076–4.843)	<0.001	1.141 (0.604–2.157)	0.685
No	126 (40.0)	189 (60.0)				
BMI						
Underweight	5 (19.2)	21 (80.8)	ref			
Normal	42 (36.8)	72 (63.2)	2.450 (0.860– 6.980)	0.093	1.270 (0.337–4.784)	0.724
Overweight	69 (46.6)	79 (53.4)	3.668 (1.313–10.248)	0.130	1.394 (0.379–5.123)	0.617
Obese	103 (62.8)	61 (37.2)	7.092 (2.543–19.774)	<0.001	1.999 (0.539–7.417)	0.300
Regular exercise						
Yes	94 (46.8)	107 (53.2)	0.886 (0.611–1.284)	0.521		
No	125 (49.8)	126 (50.2)				

VARIABLES	PAP SMEAR UPTAKE		Crude OR (95% CI)	p-value	Adjusted OR (95% CI)	p-value
	Yes N (%)	No N (%)				
Knowledge of cervical cancer symptoms						
Yes	99 (54.7)	82 (45.3)	1.519 (1.041–2.218)	0.030	1.745 (1.065–2.857)	0.027
No	120 (44.3)	151 (55.7)				
Knowledge of risk factors of cervical cancer						
Yes	105 (45.3)	127 (54.7)	0.769 (0.531–1.113)	0.769		
No	114 (51.8)	106 (48.2)				
Support from family to undergo Pap smear						
Yes	148 (67.6)	119 (51.1)	1.997 (1.363–2.926)	<0.001	3.620 (2.081–6.298)	<0.001
No	71 (32.4)	114 (48.9)				
Willingness to have a male doctor perform the Pap smear						
Yes	50 (55.6)	40 (44.4)	1.428 (0.897–2.271)	0.133	1.183 (0.650–2.155)	0.582
No	169 (46.7)	193 (53.3)				
Having a person to approach first if symptomatic						
Yes	195 (47.8)	213 (52.2)	0.763 (0.409–1.424)	0.396		
No	24 (54.5)	20 (45.5)				
Requiring support if symptomatic						
Yes	188 (46.8)	214 (53.2)	0.538 (0.294–0.985)	0.042	0.956 (0.451–2.024)	0.906
No	31 (62.0)	19 (38.0)				
Contraception use						
Yes	96 (65.3)	51 (34.7)	2.785 (1.849–4.195)	<0.001	2.220 (1.314–3.750)	0.003
No	123 (40.3)	182 (59.7)				

Discussion

The percentage of Pap smear uptake in the previous 3 years among the women in this study was 48.5%. This finding corroborates a report published in a local study.⁹ The Pap smear uptake in this study appeared to be slightly higher than the uptake reported in the Fifth Malaysian Population and Family Survey (MPFS-5) 2014 and the National Health Morbidity Survey 2019, which reported that only 39.9% and 36.6% of eligible women in Johor and nationwide had undergone Pap smear testing within 3 years, respectively.^{7,8} The difference in uptake is small, but it may reflect an increasing awareness of cervical cancer screening among women in Johor over time. Despite our study reporting a comparable percentage of uptake with other local studies, the results were still suboptimal in comparison to developed countries, such as the United Kingdom, Argentina, and Finland.⁴

In other states in Malaysia, a higher uptake of Pap smear screening was seen among university staff in Nilai,¹⁰ urban women in Selangor,¹¹ and working women in Kedah.¹⁵ This difference may be attributable to the

higher socioeconomic and education levels of the respondents in these studies; university staff are presumably more educated on health-related matters, and peer information-sharing may be a contributing factor in encouraging Pap smear uptake.¹⁰ The sample in the Selangor study was confined to government health centres,¹¹ where active promotion of cancer screening with a monthly target of screened cases is likely to be in place and may have influenced the higher uptake rate.

Despite the introduction of Pap smear screening to local healthcare in 1969, most Malaysian women lack awareness of the importance of Pap smears in cervical cancer detection. Fewer than half of our respondents had adequate knowledge of cervical cancer symptoms, a finding consistent across previous local studies.^{10,14,15–17} Only half of our respondents displayed adequate knowledge regarding the risk factors of cervical cancer. This lack of knowledge of cervical cancer risk factors was also demonstrated in a study conducted at a public university in Nilai.¹¹

Our study showed that increased knowledge of cervical cancer symptoms was significantly associated with a higher Pap smear uptake, a finding corroborated by local and international studies.^{8,18} A mere 2.4% of participants in our study were able to answer that cervical cancer could be asymptomatic, which may be a significant factor in the low Pap smear uptake in the community. Lack of awareness of the asymptomatic early stages of cervical cancer may predispose these women to default Pap smear screening intervals and opportunities to detect and manage these lesions early. This finding highlights the asymptomatic phase of cervical cancer as a crucial area to address in public health education and to facilitate improved public understanding of cancer progression and the importance of regular Pap smear screening. Abdullah et al. found poor Pap smear uptake among secondary school teachers, highlighting that this lack of knowledge regarding cervical cancer and its screening did not only affect women of lower educational backgrounds, and that this gap in knowledge was more likely to be found in women who had never had a Pap smear.¹² A systematic review and meta-analysis found that the use of theory-based cervical cancer education interventions significantly increased Pap smear screening uptake, particularly when communities with low literacy levels were targeted for such interventions.¹⁹ It is therefore imperative for health care providers to improve the education of women regarding cervical cancer to better improve their health awareness in actively seeking screening tests and ultimately lead to earlier disease detection.

Support from the woman's family to undergo a Pap smear was shown to be a significant predictor for Pap smear screening uptake in this study, with local and foreign studies showing a similar positive association.^{10,17} Encouragement from the family assisted in motivating the women to undergo screening and helped to reduce anxiety and fear. Most of the women in our study also reported their spouse as their first person to approach if they developed symptoms suggestive of cervical cancer. This phenomenon is especially prevalent in Asian countries, where most societies are patriarchal by nature and men typically lead the household. These findings highlight an important and commonly overlooked aspect of Pap smear screening, which is the involvement of men and their

role in supporting this essential screening of their partners. Therefore, programmes promoting awareness and information on cervical cancer and screening should be broadened to not only the woman but to their spouse and family as well.

Contraception practice was another modifiable factor shown to be significantly associated with increased Pap smear uptake in this study, a finding that corroborated previous studies.^{11,20} The practice of family planning may be associated with increased knowledge and awareness of women's health, and these women may in turn receive education on cervical cancer screening during such appointments. Most of the respondents in our study, however, did not practice contraception or regular physical activity and were obese, which highlights a lack of positive health behaviours. It is therefore imperative for health counselling on cervical cancer screening to not be restricted to women who only present for obstetric or gynaecologic services, as these represent only a subset of the eligible women for Pap smear screening.

The women in our study cited the government as their primary source of information on cervical cancer screening, and this finding reflects a regular and familiar interaction between the public and the government health system. This finding also reveals the strategic position of government workers as the best intermediary to dispense accurate information on cervical cancer to the public. The importance of cancer information on screening uptake had been emphasised in a previous study acknowledging physician recommendation as one of the strongest predictors of cancer screening uptake.^{20,21} Proper training and regular knowledge updates from the government are therefore vital to improving the education of the public. Government health outreach programmes can be tailored to be implemented in the community, rather than being institution-based, to facilitate the involvement of more women who may face difficulties or anxiety when visiting health facilities. Social media incorporation can increase effectiveness in disseminating information and correcting public misconceptions that may otherwise impede Pap smear uptake.

Our findings showed that married women were five times more likely to undergo Pap

smear testing, a pattern consistent with other studies.^{12,14,16} The influence of marital status on Pap smear uptake is due to the increased likelihood of married women obtaining obstetric and family planning services, in which opportunistic counselling on cervical cancer screening may occur.

We also found that a younger age at first pregnancy and a parity ≥ 5 were associated with increased Pap smear uptake, a finding corroborated by other studies.^{12–14} The opportunistic exposure to cervical cancer information during frequent obstetric and child care clinic visits could be the contributing factor of higher Pap smear uptake among these women, which suggests an increasingly younger target population for cervical cancer screening information to improve awareness and screening uptake.

An increasing age was also found to be a factor strongly associated with Pap smear uptake, a finding concordant with many studies,^{12–14} and which is likely due to the increased frequency of clinic visits and disease screening tests over time.

Our study found no significant association between the willingness to undergo a Pap smear when a male physician was performing the procedure and Pap smear uptake. This finding contrasted an Asian study reporting a preference for female doctors for performing Pap smears or examinations on intimate parts of the body and citing embarrassment as a potential barrier to undergoing a Pap smear.²² This surprising finding may highlight an increasingly open-minded female community or the possibility of past obstetric or gynaecologic experience with male health providers.

Pap smear screening differs across countries, and these screening programmes are generally categorised into two types: opportunistic screening and organised screening.²³ The Pap smear screening programme in Malaysia is currently of the opportunistic type, which makes use of patient encounters at a health facility to offer the screening service. Opportunistic screening, while recording information from the smears, does not have a universal registry of all women eligible for screening, and thus omits those who do not otherwise present to health facilities. Organised screening is recommended by international organisations such as the WHO,

due to direct optimisation of participants. Organised screening is provider-initiated and utilises an integrated health care system linked to a population-based registry.²⁴ Direct notifications for screening appointments are sent to eligible women at designated intervals. The drawback of organised screening is the complexity of the linked system and resource-heavy demands. Pap smear uptake is shown to be higher in developed countries, such as Australia and Singapore, with organised screening programmes, highlighting a better coverage using the system.^{25,26} In addition to addressing the factors investigated in the study, a gradual transition to organised screening for Pap smears would be beneficial to expand coverage to women who would otherwise be missed during visits to healthcare facilities. A significant transition would likely require collaboration between the health ministry authorities, private medical organisations, and legal and data expertise.

The findings of our study address the gap in the literature, particularly for the southern region of Peninsular Malaysia, and provide insights into primary care providers regarding factors that influence Pap smear uptake. Our study utilised self-administered questionnaires without confirmation of clinical records and is therefore vulnerable to response bias, though we had aimed to minimise such bias by maintaining the anonymity of the respondents. The use of the bilingual questionnaire may have also limited the range of respondents to those who were proficient in only English or the Malay language. As the study was limited to women attending outpatient clinics in the state of Johor, it may also be difficult to generalise the study findings to all women in the state and in Malaysia. Further elucidation of social or personal barriers faced by the participants in undergoing Pap smear screening and participant recommendations to overcome them were not explored in this study. These aspects should be addressed in future studies, as they could provide insight into the expectations of women when they seek screening from primary health care facilities and improvements to services that could be made to encourage Pap smear uptake.

Conclusion

In conclusion, our study showed that Pap smear screening uptake remains suboptimal in Johor, which mirrors the findings in other states in Malaysia. The factors significantly

associated with increased Pap smear uptake in this study included increasing age, being married, having a parity of five or more, younger age at first pregnancy, knowledge of cervical cancer symptoms, support from family, and contraception use.

It is therefore vital for policy makers and the government to tailor public health initiatives to target knowledge and positive health behaviour and to broaden these programmes to not only involve women but also their families.

Education efforts regarding cervical cancer and Pap smear screening do not necessarily have to begin at antenatal or gynaecologic visits and should be broadened to young women before marriage and initiation of sexual activity; this should be achieved through public health engagement in secondary schools, tertiary institutions, and workplaces. The use of brochures and factsheets can be complemented by strong promotion via social media to spread awareness among an increasingly tech-savvy population.

These efforts should not stop at the woman in question. Engaging husbands and other family members may be essential to ensuring a holistic approach in the early detection of cervical cancer. Opportunistic counselling regarding cervical cancer risk and Pap smears can be provided to members of the public—health consultations represent one of these many opportunities. Healthcare workers

who are in constant contact with patients should keep abreast of developments in cervical cancer screening to ensure accurate dissemination of health information.

The integration of a Pap smear screening programme with a population-based cancer registry may significantly improve coverage of eligible women who may otherwise be missed during opportunistic visits to health clinics. Such an integration necessitates national collaboration between the health ministry authorities, private medical organisations, and legal and data expertise.

It is through addressing the factors that have been investigated in this study that improved health policies and programmes may be put into place to ensure effective education regarding Pap smear screening, and lead to early detection and treatment of cervical cancer.

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Conflicts of interest

All authors declare no conflicts of interest.

How does this paper make a difference to general practice?

- This study provides insight into the factors associated with Pap smear uptake, which may be targeted to improve the uptake, especially at a primary care level.
- Factors including knowledge regarding cervical cancer and support from family are associated with a better screening uptake, which suggests that broader education on cervical cancer awareness that is targeted not only to women but also their families may be optimal in outreach programmes.
- This study adds to the knowledge base on Pap smear uptake in Johor, and the current uptake in the state remains suboptimal and needs improvement.

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ORIGINAL ARTICLE

Prevalence and factors associated with sexual dysfunction among middle-aged women in a multi-ethnic country: A cross sectional study in Malaysia

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Abstract

Introduction: This study aimed to determine the prevalence and factors associated with female sexual dysfunction in an outpatient clinic in Malaysia.

Methods: The study was conducted among female patients aged 50 years and older who attended the outpatient clinic of a public hospital in Malaysia. A self-administered questionnaire was used that was based on the Malay version of the Female Sexual Function Index questionnaire. The predictors of female sexual dysfunction were identified using multivariate logistic regression analysis.

Results: A total of 263 females were recruited in this study, with a mean age of 60.6 ± 6.7 years. The distribution of the respondents' ethnicities was mostly Malay (42.2%), followed by Chinese (41.8%) and Indian (16.0%). The prevalence of female sexual dysfunction among participants was 68.8%. The prevalence of the subscales of female sexual dysfunction was as follows: desire (85.2%), satisfaction (74.9%), arousal (71.1%), lubrication (66.9%), pain (61.2%), and orgasm (60.8%). According to multivariate logistic regression, patients of Indian ethnicity had an increased risk of female sexual dysfunction (OR=16.60, 95% CI=2.54–108.63), and a higher frequency of sexual intercourse was correlated with a lower risk of female sexual dysfunction (OR=0.13, 95% CI=0.08–0.24).

Conclusion: Seven-tenths of the middle-aged female patients attending the outpatient clinic suffered from female sexual dysfunction. Indian ethnicity and having a lower frequency of sexual intercourse were predictors of female sexual dysfunction. Future intervention studies are needed to address this problem.

Introduction

Sexuality is a significant element of women's lives,¹ and sexual activity has a positive impact on women's physical health. Sexual dysfunction affects the quality of life of women.¹ Globally, about 41% of women have issues with some aspect of sexual activity.² Female sexual dysfunction (FSD) in women is often defined as a permanent or chronic condition and is classified into five categories: sexual desire, sexual arousal, painful intercourse, failure to experience orgasm and pain disorder.² The aetiology of FSD is often multifactorial and generally includes various components such as anatomy, physiology, medical, psychology, and social.³

In most cases, the issues of sexuality and middle-aged women must be considered as a naturally occurring combination. Detailed studies are required to provide a broader framework for the multiple aspects of FSD in older women.³ Emerging reports on FSD highlight its association with increasing age.³ The age-related changes in the physiology of women lead to various sexual problems in women. The prevalence of FSD in older age groups is relatively higher with chronic health issues and menopause.⁴ However, a more complex mechanism involved in female sexuality and the limited number of universally accepted models of the female sexual response make studying FSD a challenge.⁵

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The observed and perceived health of women, race/ethnicity, number of premarital partners, religion, sexual orientation, communication with their partner, and attitude towards sexuality were reported as predictors of FSD.⁶ There was a diverse range of FSD prevalence reported from studies worldwide. With collective and diverse customs and traditions, the sexual attitudes and behaviours of Asian populations are predominantly influenced by certain factors, irrespective of their age group.⁷ Like many Asian countries, Malaysia is a conservative country, and sexual dysfunction, especially FSD, does not receive much attention in clinical settings.⁸ In treating FSD in any individual patient, physicians can focus on patient-specific information and treat them accordingly. There is hesitance in middle-aged and older women to discuss their sexual dysfunction with their physicians.⁹ The cultural attitudes towards sexual activities in social settings significantly impact women's willingness to seek help from their physicians.¹⁰ There is a need for better understanding of FSD in Malaysia to ensure suitable preventive measures and strategies to promote female sexual health. This study aimed to determine the prevalence and factors associated with FSD in an outpatient clinic in Malaysia.

Methods**Study participants**

This study was a cross-sectional study conducted between March 2016 and June 2016 on older women, aged 50 years and older, who visited a medical outpatient clinic in a public hospital in Malaysia. The inclusion criteria were: a married women aged 50 years or older, having a partner, and being able to read or understand the Malay or English language. The exclusion criteria were: women diagnosed with psychiatric illness or mentally

challenged women. After the screening, the participants were recruited using a systematic sampling method. All participants were provided with written informed consent.

Sample size

The sample size was calculated by using Epi Info 6.0, based on the prevalence in the local study, which was 25.8% to 29.6%.^{11 12} The estimated sample size was 196, with 80% power, a 95% confidence interval (CI), and a statistically significant level (α) at 5%. The total number of respondents needed was 245, after considering a non-respondent rate of 20%.

Study tool

A questionnaire was used to evaluate clinical and epidemiological characteristics of female sexual function and socio-demographic risk factors associated with FSD. The first part of the questionnaire included patients' socio-demographic data, comorbidities, marital status, use of hormone replacement therapy, and use of lubricants during sexual intercourse. The second part of the questionnaire consisted of 19 items from the Malay version of the Female Sexual Function Index (MVFSFI), and was used to measure sexual function in the study participants.²¹ The questionnaire was locally validated and was considered a reliable and valid questionnaire (Cronbach's $\alpha=0.967$). The sensitivity of the questionnaire was 99%, and the specificity was 97%, based on a cut-off point of 55. This questionnaire had six subscales, including desire, arousal, lubrication, orgasm, satisfaction, and pain. The score of the questionnaire ranged from 4 to 95, and scores lower than 55 indicated sexual dysfunction. The scoring system for each domain is shown in **Table 1**.

Table 1. Scoring system for subdomains of the Female Sexual Function Index questionnaire

Domain	Item number	Score range	Min. / Max. score	Cut-off point for dysfunction
Desire	1,2	1–5	2 / 10	≤ 5
Arousal	3,4,5,6	0–5	0 / 20	≤ 9
Lubrication	7,8,9,10	0–5	0 / 20	≤ 10
Orgasm	11,12,13	0–5	0 / 15	≤ 4
Satisfaction	14†,15*,16*	0 (or 1)–5	2 / 15	≤ 11
Pain	17,18,19	0–5	0 / 15	≤ 7
Total	1–19	-	4 / 95	≤ 55

Note: † Score for item 14 ranges from 0 to 5; *score for items 15 and 16 range from 1 to 5.

Data analysis

The data from this study were analysed using the Statistical Package for Social Sciences (SPSS) version 22.0. Continuous data are presented as means and standard deviation if the distribution is normal, and as median and interquartile range (IQR) if the distribution is skewed. The chi-square test and Fisher's exact test were performed for categorical variables, while an independent t-test was used to compare means if they were normally distributed. Variables with p values less than 0.25 in univariate analysis were included in multiple logistic regressions to explore the risk factors of FSD. The test of significance was two-tailed, and a p-value of less than 0.05 was considered statistically significant, at a 95% confidence interval.

Ethical approval

Ethical approval was obtained from the Human Research Ethics Committees of UPM (FPSK (EXP15-medic) U001 (Y4) and the National Medical Research Registry (NMRR):

NMRR- 15-104-24225 (IIR) prior to the data collection. This study was conducted according to the Helsinki Declaration.

Results

Of the 320 eligible patients, 263 patients participated in this study, with a response rate of 82%. The average age of the study participants was 60.6 years (SD=6.7 years). The details of the respondents' socio-demographic profiles are presented in Table 2. Among the study participants, 98.5% of women lived with their married partners, and the average duration of married life was 39 ± 9 years. The average age of the women's partners was 64 ± 8 years. The frequency of sexual intercourse in the past 1 month was 1.1 ± 1.8 , with the highest frequency recorded at 16. Lubricant use during sexual intercourse was reported by 11% of respondents, and 5.7% of respondents were on hormone replacement therapy. Almost half of the patients had hypertension (48.3%), and one third of the patients had diabetes mellitus (31.2%).

Table 2. Comparison of socio-demographic data and clinical variables among respondents with and without female sexual dysfunction in an outpatient clinic (n=263)

Variable	FSD (n=181)	No FSD (n=82)	p-value
Age, years	61.8 (6.70)	58.0 (5.78)	<0.001
Duration of marriage, years	37.1 (9.60)	32.8 (7.66)	<0.001
Age of husband, years	65.3 (8.01)	61.1 (7.15)	<0.001
Ethnicity, n (%)			<0.001
Malay	58 (52.3)	53 (47.7)	
Chinese	84 (76.4)	26 (23.6)	
Indian	39 (92.9)	3 (7.1)	
Educational level, n (%)			0.009
Lower than tertiary	158 (72.1)	61 (27.9)	
Tertiary	23 (52.3)	21 (47.7)	
Occupation, n (%)			0.263
Blue collar	17 (81.0)	4 (19.0)	
White collar	14 (58.3)	10 (41.7)	
Not working	150 (68.8)	68 (31.2)	
Frequency of marriage, n (%)			0.591
First	179 (69.1)	80 (30.9)	
Second	2 (50.0)	2 (50.0)	
Use of lubricant, n (%)			0.003
Yes	13 (44.8)	16 (55.2)	
No	168 (71.8)	66 (28.2)	
Use of HRT, n (%)			0.566
Yes	9 (60.0)	6 (40.0)	
No	172 (69.4)	76 (30.6)	
Frequency of sexual intercourse in the past 1 month, n	0.2 (0.72)	2.9 (2.10)	<0.001
Number of children, n	3.4 (1.88)	4.2 (1.99)	0.004
Asthma/COPD, n (%)			0.258
Yes	16 (59.3)	11 (40.7)	
No	165 (69.9)	71 (30.1)	
Hypertension, n (%)			0.489
Yes	90 (70.9)	37 (29.1)	
No	91 (66.9)	45 (33.1)	
Diabetes mellitus, n (%)			0.11
Yes	62 (75.6)	20 (24.4)	
No	119 (65.7)	62 (34.4)	

Variable	FSD (n=181)	No FSD (n=82)	p-value
<i>Ischaemic heart disease, n (%)</i>			0.032
Yes	25 (86.2)	4 (13.8)	
No	156 (66.7)	78 (33.3)	
<i>Osteoarthritis, n (%)</i>			0.831
Yes	29 (67.4)	14 (32.6)	
No	152 (69.1)	68 (30.9)	
<i>Urinary incontinence, n (%)</i>			0.061
Yes	8 (100.0)	0 (0.0)	
No	173 (67.8)	82 (32.2)	

Note: FSD= female sexual dysfunction; COPD=chronic obstructive pulmonary disease; n=number
HRT=hormone replacement therapy

According to the MVFSFI scores, the prevalence of FSD in women who attended the outpatient clinic was 68.8%, and patients of Indian ethnicity (92.9%) had the highest frequency of FSD as compared with women of Chinese (76.4%) and Malay (52.3%) ethnicity (Table 2). Table 3 presents the frequency and mean scores for the subscales of the FSFI questionnaire. The mean MVFSFI score was 27.4 ± 6.74 . The most common domain dysfunction was desire disorder (n=224, 85.2%). Table 4 shows the predictors of FSD among older married women using multiple logistic regressions. Indian ethnicity (OR=16.60, 95% CI=2.54–108.63) was associated with an increased risk of female sexual dysfunction. In contrast, higher frequency of sexual intercourse in the past 1 month was associated with a lower risk female sexual dysfunction (OR=0.13, 95% CI=0.08–0.22).

Table 3. Prevalence in overall and subdomain female sexual dysfunction (n=263)

	Prevalence, n (%)	Median score (IQR)
FSD*	181 (68.8)	27.4 (31.02)
6 subscales of FSFI		
Desire	224 (85.2)	3.2 (1.59)
Arousal	187 (71.1)	4.7 (5.83)
Lubrication	176 (66.9)	5.6 (7.33)
Orgasm	160 (60.8)	4.3 (5.55)
Satisfaction	197 (74.9)	4.7 (6.02)
Pain	161 (61.2)	4.9 (6.19)

Note: FSD=female sexual dysfunction; FSFI=female sexual function index

Table 4. Predictors of female sexual dysfunction in an outpatient clinic (n=263)

Variable	Adjusted OR	95% CI		p value
<i>Ethnicity</i>	16.602	2.537	108.632	<0.001
Indian	2.416	0.924	6.321	
Chinese	1			
Malay				
Increased frequency of sexual intercourse in the past 1 month	0.13	0.082	0.240	<0.001
<i>Education level</i>				0.884
Tertiary	1			
Lower than tertiary	0.907	0.244	3.366	
Duration of marriage	1.065	0.981	1.157	0.135
Age of husband	0.954	0.837	1.088	0.483
Number of children	0.843	0.626	1.136	0.262
<i>Ischaemic heart disease</i>				0.432
Yes	1.94	0.371	10.143	
No	1			
<i>Use of lubricant</i>				0.407
No	1			
Yes	0.59	0.169	2.055	

Discussion

The sensitivity of female sexuality and its relationship with quality of life may vary between countries due to differences in lifestyles and cultures. This is also likely due to differences in women's preferences regarding their sexual activities and their relationship with their sexual partner, which are related to social and cultural values. In this study, the significant average frequency of sexual intercourse over the past 1 month was 1.1 ± 1.8 ; 0.2 among women with FSD and 3 among women without FSD. This finding could reflect the participants' responses to the subdomains of arousal, lubrication, orgasm, satisfaction, and pain score.

To measure FSD among study participants precisely, we used the MVFSFI, a validated scale in Malaysia. The data from the study revealed that almost 7 out of 10 females aged 50 years or older who attended outpatient clinic had FSD. Our study reported that the prevalence of FSD among middle-aged women was 69%, a value that was much higher than in other studies conducted in Malaysia. In a similar study in Malaysia, the prevalence of FSD was reported to be 29.6% among females aged 18–70 years in an outpatient clinic.¹² The possible explanation for these results was that most of the respondents were younger than 50 years old, whereas, in our study, the mean age of the respondents was older (39.2 years vs 60.6 years).

With a higher prevalence of FSD (68.8%), this study clearly showed that the problem of FSD among women who visited outpatient clinics requires increased attention from physicians. Although earlier reports mentioned that the prevalence of FSD among the female population in Asia was high, their willingness to seek treatment and follow-up was much lower.^{7,13} In Asia, including Malaysia, the perceptions and culture prevents people from openly discussing their sexual issues, even with their physician.^{14,15} Their sexual issues are not explicitly addressed in clinics, as many female patients believe that their sexual issues are not important in the later stages of life.

Reports suggest that FSD occurs more often in women with diabetes mellitus¹⁶ and hypertension.¹⁷ The presence of diabetes mellitus could affect both psychological and physiological factors in women.¹⁶ Evaluation of FSD in women older than 50 years of age depends on various factors, such as study

design, hormonal status, and geographical location, and cannot be definitively measured¹⁸; therefore, FSD must be addressed during patient interactions. To manage FSD early, physicians need to identify FSD and recognise comorbidities, such as diabetes and hypertension. Surprisingly, there was no association between FSD and either diabetes or hypertension in our study. The possible explanation for this finding could be that the frequency of lubricant use was similar between women with and without diabetes mellitus (12.2% and 10.5%, respectively) and between women with and without hypertension (9.4% and 12.5%, respectively). Therefore, diabetes and hypertension were not associated with FSD in our study. Moreover, it was reported that hypertension was associated with FSD due to hypertensive women had decreased vaginal lubrication as compared with normotensive women.¹⁹

Desire dysfunction appeared to be the most common subscale issue (85.2%) among the participants, as compared with other subscales: arousal disorder (71.1%); lubrication disorder (66.9%); orgasm disorder (60.8%); satisfaction issue (74.9%) and pain disorder (61.2%). This value was significantly higher than in previous global studies, where the frequency of desire dysfunction was between 24% and 36%.^{5,20} Nonetheless, desire dysfunction is the most prevalent sexual disorder among women who are diagnosed with FSD.²¹ Desire dysfunction in women with FSD is correlated with age, educational, economic and marital status.²² The high frequency of desire dysfunction reported in our study may indicate the issues faced by married women in Malaysia. In Malaysia, sharing the details of couples' intimate relationships with others goes against cultural values¹⁴; therefore, most women, especially those who are in a later stage of married life, restrict themselves from expressing their sexual desires to their partners. In addition, women in Malaysia are often too embarrassed to talk openly about their sex lives with anyone, including their physicians, as they are concerned about confidentiality. Another possible factor could be societal stereotypes, which suggest that sexual life should decrease with age, and that any older person exhibiting sexual interests should be labelled as aberrant, especially elderly women.⁷

Satisfaction dysfunction was the second most common disorder among participants. Sexual satisfaction, a significant element of sexuality

associated with human well-being,⁵ contributes to both physical and psychological health.²³ The high frequency of satisfaction dysfunction could be due to physiological changes, including hormonal changes, in women. The results also showed that the patients had issues with arousal, lubrication, pain, and orgasm, which represent the most common patterns of FSD. Satisfaction dysfunction in Asian women could also be associated with the man's ability to become erect, maintain his erection, and the erection hardness.²⁴ Another possible factor could be less physical contact and decreased duration of sexual foreplay, which both increase satisfaction dysfunction.²⁵ The study also reported that the associated sexual problems of arousal, lubrication pain, and orgasm depended on individual sensitivity to sexual stimulation.²⁶

FSD in participants was associated with various demographic characteristics, particularly ethnicity. More Indian females had FSD than the other ethnicities in this study. This finding contradicts a previously published study, which reported Malay ethnicity as a risk factor for FSD.¹³ The rate of FSD has been associated with older age and menopause, higher education level, longer duration of married life, having more children, and having an older husband.^{9,13,27,28}

Lifestyle parameters play an important role in FSD and vary between different ethnic groups.¹⁰ Cultural attitudes and beliefs can possibly influence a patient's help-seeking behaviour for their sexual difficulties.¹⁰ This may be the reason for the varying prevalence rates of FSD among participants.

Interestingly, this study revealed that a higher frequency of sexual intercourse was associated with a lower risk of having FSD. Gillespie[#] reported that older adults who had sexual intercourse more often were more active in their sex lives.²⁹ The ideal frequency of sexual

intercourse varies between individuals, and it depends on several factors, such as age, sociocultural factors, and desire.³⁰

There are a few limitations to this study. First, the results may not be generalisable to all women in Malaysia, as the study site was conducted at an outpatient clinic in a tertiary hospital. This study did not combine any data from earlier studies to compare the associations between the socio-demographic profiles and FSD of Malaysian women. The exclusion of the participants' sexual partners in the understanding of FSD was also one of the limitations. Therefore, we must interpret the results of this study cautiously in consideration of its constraints.

A flexible approach is one of the cornerstones of effective treatment of FSD. The prevalence of FSD was high among Malaysian women over 50 years old who visited an outpatient clinic. Therefore, physicians in healthcare settings must focus on screening for FSD when they have female patients over 50 years of age. Future research should focus on how the cultural attitudes and beliefs of Indian women influence their help-seeking behaviour for sexual dysfunction, and what type of awareness programmes could impact the sex lives of older women.

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Conflicts of interest

The authors declare that there are no competing interests.

How does this paper make a difference in general practice?

- Female sexual dysfunction affects quality of life, especially in older women.
- A higher frequency of sexual intercourse is correlated with a lower risk of developing female sexual dysfunction.
- Indians in Malaysia having a lower frequency of sexual intercourse are predictors for female sexual dysfunction.
- This study may pave the way for future intervention studies on FSD in Malaysian elderly subjects, particularly in Indian ethnicities.

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ORIGINAL ARTICLE

Knowledge on postpartum type-2 diabetes mellitus screening among pregnant women with gestational diabetes mellitus in Malaysia

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Abstract

Introduction: Despite the effectiveness of postpartum type 2 diabetes mellitus (T2DM) screening to detect and manage T2DM among women with a history of gestational diabetes mellitus (GDM), the uptake remains low, indicating the potentially low level of relevant knowledge. This study aims to identify the prevalence of postpartum T2DM screening and its associated factors.

Methods: A cross-sectional study was conducted involving 116 pregnant women with GDM who attended antenatal care follow-up at government health clinics in Seremban District, Negeri Sembilan. Multistage cluster sampling was performed to recruit the respondents from 6 mukims and 10 public health clinics. The data were collected using a validated and pre-tested questionnaire, with Cronbach's alpha values ranging from 0.81 to 0.95 for each section of the questionnaire. Data were collected through face-to-face interviews during the respondents' routine antenatal follow-ups for blood sugar monitoring.

Results: Poor knowledge on postpartum T2DM screening (55.2%) was observed, which was significantly predicted by low educational level (AOR = 6.898, 95% CI 3.62–9.055) and low self-efficacy (AOR = 17.905, 95% CI 5.470–58.611).

Conclusion: Most of the respondents had poor knowledge regarding postpartum T2DM screening, which was predicted by low education and self-efficacy. The findings highlight the need for continuous education and health promotion during antenatal follow-up targeting women with GDM with low self-efficacy and education level in order to ensure better adherence to screening.

Introduction

Diabetes mellitus during pregnancy, also known as gestational diabetes mellitus (GDM), is defined as any degree of glucose intolerance with onset or first recognition during pregnancy,¹ and is diagnosed through prenatal screening, rather than reported symptoms. According to the American Diabetes Association,² approximately 4% of all pregnancies are complicated by GDM, ranging from 1% to 14% of all pregnancies, depending on the population and the method of screening.

The increasing incidence of GDM has been linked to maternal obesity and advanced maternal age.³ High prevalence of GDM has been reported among racial and ethnic minorities and women of low socioeconomic status,⁴ with Asian women being more likely to have gestational diabetes, and black and Hispanic women being more likely to progress to type 2 diabetes mellitus (T2DM).⁵

Although transient hyperglycaemia is observed during pregnancy, a systematic review on the incidence of postpartum T2DM among women with a history of GDM reported that 5–10% of the women became diabetic during the first year postpartum.⁶ Furthermore, up to 10% of women with GDM were diagnosed with T2DM soon after delivery, implying the undiagnosed status of their T2DM before pregnancy, with up to 70% of women with GDM developing T2DM within 10 years of follow-up.⁷

Abnormal glucose tolerance during the postpartum period may indicate the presence of diabetes, prediabetes, impaired glucose tolerance, impaired fasting glucose, or elevated glucose tolerance.⁸ The long-term complications associated with T2DM in women with GDM can be reduced through early diagnosis and timely intervention.

The World Health Organization (WHO) has recommended the earliest period of glucose testing at 6 weeks postpartum to detect abnormal glucose tolerance in women with a history of GDM.⁹ The 6-week screening may prevent and delay the onset of T2DM soon after the postpartum period through lifestyle modifications, such as dietary changes, increased physical activity, weight management, and/or pharmacological intervention.¹⁰ However, uptake of the 6-week postpartum T2DM screening has generally been low.

Numerous studies have explored the barriers related to poor postpartum T2DM screening uptake. Among the reported barriers were maternal age, ethnicity, education level, income status,¹¹ and obstetric factors, such as parity, booking history, and history of insulin treatment.¹¹ Limited research focuses on the level of knowledge related to the importance and impact of screening on women's postpartum diabetic control and management. This study aims to identify the prevalence and factors associated with postpartum T2DM screening among pregnant women with GDM.

Methods

A cross-sectional study was conducted on pregnant mothers with GDM who attended antenatal care in government health clinics in Seremban District, Negeri Sembilan. Multistage cluster sampling was employed, with *mukim* in Seremban and government health clinics being the primary and secondary clusters. *Mukim* refers to the administrative divisions in a district. We randomly selected 6 out of 8 mukims according to the calculated cluster size: *mukim* Rantau, *mukim* Labu, *mukim* Setul, *mukim* Ampangan, *mukim* Rasah, and *mukim* Pantai. A total of 10 public health clinics were selected from all the selected mukims. All eligible respondents from the 10 health clinics were included. Eligibility included being a Malaysian citizen aged 18 years or older, being a pregnant women diagnosed with GDM (based on a meal glucose tolerance test [MGTT]) during their current pregnancy, being between 24- and 28-weeks gestation, and being able to read and understand the Malay (Bahasa Malaysian) or English language.

The sample size for this study was calculated using the two proportions formula hypothesis

testing by Lwanga and Lemeshow.¹² After taking into consideration the design effect and adjusting for 90% eligibility of respondents, the estimated sample size was 120. Only 116 respondents participated in the study, with a response rate of 96.7%. The data were collected using a validated and pre-tested questionnaire that was adapted from a cross-sectional study conducted in Chennai, India by Bhavadharini et al.¹³ Content validity was conducted by three experts in the field of public health, with the mean I-CVI for each section of the questionnaire ranging from 0.95 to 1.0. Face validity was performed among 15 GDM mothers from the health clinic who were excluded from the study, and modifications were made accordingly based on the feedback. Similarly, a pre-test was conducted among respondents of similar background who were not involved in the study to measure the internal consistency (Cronbach's alpha) of each section of the questionnaire and the intra-cluster correlation coefficient (ICC). The Cronbach's alpha values ranged from 0.81 to 0.95 and the ICC ranged from 0.58 to 0.88, with Cronbach's alpha and ICC values ≥ 0.60 considered good internal consistencies. Data entry and statistical analysis were performed using IBM Statistical Package for Social Science (SPSS) version 23.0. A p-value < 0.05 was set as the significance level for the analysis. Ethical approval to conduct the study was obtained from the Medical Research and Ethics Committee, Ministry of Health Malaysia (Ref. No.: NMRR-18-2902-42875 [IIR]) and the Ethic Committee for Research Involving Human Subject of the Universiti Putra Malaysia.

Results

Table 1 shows the detailed background characteristics of the respondents. The mean age of the respondents was 32.45 ± 3.94 years, and a majority were between the ages of 20 and 34 years. Most of the respondents were Malay (65.5%), had received at least a secondary level of education (51.7%), were unemployed (51.7%), multigravida (88.8%), had no history of GDM during a previous pregnancy (64.7%), were not taking insulin as their glucose control method (62.1%), had poor knowledge (55.2%), negative attitude (56.9%), and high self-efficacy towards attending the postpartum T2DM screening (53.4%).

Table 1. Background characteristics of the respondents (N=116).

Factors	Mean $\pm$ SD	n (%)
<i>Age</i>	32.45 $\pm$ 3.94	
20–34 years		77 (66.4)
≥ 35 years		39 (33.6)
<i>Ethnicity</i>		
Malay		76 (65.5)
Chinese		10 (8.6)
Indian		23 (19.8)
Other		7 (6.0)
<i>Highest formal education level</i>		
Secondary		60 (51.7)
Tertiary		56 (48.3)
<i>Occupational status</i>		
Employed		56 (48.3)
Unemployed		60 (51.7)
<i>Order of pregnancy</i>		
Primigravida		10 (8.6)
Multigravida		103 (88.8)
Grandmultigravida		3 (2.6)
<i>History of previous GDM</i>		
No		62 (53.5)
Yes		40 (34.4)
Not applicable		14 (12.1)
<i>Usage of insulin in current pregnancy</i>		
No		72 (62.1)
Yes		44 (37.9)
<i>Knowledge on postpartum T2DM screening</i>		
Good		52 (44.8)
Poor		64 (55.2)
<i>Attitude towards postpartum T2DM screening</i>		
Positive		50 (43.1)
Negative		66 (56.9)
<i>Self-efficacy towards attending T2DM postpartum screening</i>		
High		62 (53.4)
Low		54 (46.6)

GDM = Gestational diabetes mellitus, T2DM = Type 2 diabetes mellitus

Multiple logistic regression analysis was performed to determine the predictors of knowledge on postpartum T2DM screening (Table 2). Respondents with secondary education being their highest education level and low self-efficacy had 6.9 (AOR = 6.898, 95% CI 3.621–9.055) and 18.0 (AOR = 17.905, 95% CI 5.470–58.611) odds of having poor knowledge of postpartum T2DM screening, respectively, compared with respondents who had tertiary education and high self-efficacy.

Table 2. Predictors for knowledge of type 2 diabetes mellitus (T2DM) screening.

Variable	β	SE	Wald	df	p-value	Odds ratio	95% CI	
							Lower	Upper
<i>Age group</i>								
20–34 years	-0.352	0.530	0.443	1	0.506	0.703	0.249	1.985
>35 years (ref)								
<i>Highest formal education level</i>								
Secondary	0.829	0.497	2.787	1	0.025*	6.898	3.621	9.055
Tertiary (ref)								
<i>Employment status</i>								
Unemployed	0.443	0.515	0.740	1	0.390	1.558	0.567	4.275
Employed (ref)								
<i>Order of pregnancy</i>								
Primigravida	19.880	23127.962	0.000	1	0.999	430225209.8	0.000	
Grandmultigravida	19.945	23127.962	0.000	1	0.999	459227992.6	0.000	
Multigravida (ref)								
<i>History of previous GDM</i>								
No	0.964	0.559	2.975	1	0.085	2.623	0.877	7.846
Not applicable			2.975	1	0.085			
Yes (ref)								

Variable	β	SE	Wald	df	p-value	Odds ratio	95% CI	
							Lower	Upper
<i>Attitude towards postpartum T2DM screening</i>								
Negative	-0.585	0.603	0.941	1	0.332	0.557	0.171	1.816
Positive (ref)								
<i>Self-efficacy towards attending postpartum screening</i>								
Low	2.885	0.605	22.738	1	<0.001*	17.905	5.470	58.611
High (ref)								
Constant	20.859	23127.962	0.000	1	0.999	0.000		

GDM = Gestational diabetes mellitus, T2DM = Type 2 diabetes mellitus

*Significant at $p < 0.05$

Cox & Snell R square is 0.329

Nagelkerke R square is 0.441

Discussion

Over half of the respondents in our study had poor knowledge of postpartum T2DM screening. There has been limited evidence reporting on the level of knowledge related to postpartum T2DM screening among women with GDM for comparison. The information delivered through antenatal care on the importance of postpartum screening is crucial to ensure adequate uptake of the 6-week postpartum screening. According to a review by Keele,¹⁴ the risk of T2DM must be discussed during routine GDM care to increase the risk perception among women with GDM and to facilitate postpartum testing. Primary care providers play a key role in ensuring adequate uptake of = postpartum screening by increasing awareness through health promotion and education of the potentially high risk of progression to T2DM.⁹

Minsart et al.¹⁵ reported that the differences in care received by women during the antenatal and postnatal period may have contributed to poor 6-week screening uptake. The intensity of the antenatal care compared with the postnatal period caused women to focus more on their unborn baby rather than on their own health.¹⁶ Reminder telephone calls or a short messaging system (SMS) have been shown to improve the return rate for postpartum testing.¹⁷

This study also highlighted the association between education level, self-efficacy, and knowledge related to postpartum T2DM screening. The positive relationship between level of education and knowledge of T2DM has been reported in previous studies; however, the relationship between level of education and knowledge related to postpartum T2DM screening has not been addressed. A study on the general Omani population reported that their knowledge about diabetes was directly influenced by their level of education and family

history of diabetes, which possibly increased their awareness.¹⁸ Similarly, in another study, fourth-year Jordanian students were more educated about diabetes than first-year students, suggesting the positive impact of higher education on knowledge about diabetes.¹⁹ A study conducted in Rotterdam, the Netherlands, found that women with a lower educational level were three times more likely to develop GDM than women with a higher education level (OR 3.07; 95% CI 1.37–6.89) after adjusting for ethnicity, age, family history of diabetes, and parity.²⁰ However, they concluded that the relationship between low maternal educational level and GDM was mainly due to higher rates of overweight and obese women in this population, reflecting the need to focus on reducing the rates of overweight and obese women before pregnancy.²⁰

The current study indicated the positive relationship between self-efficacy and knowledge; a low level of self-efficacy predicted a low level of knowledge related to postpartum T2DM screening. The association between self-efficacy and knowledge of diabetes in general has almost never been reported in the literature. Instead, self-efficacy has been shown to be positively correlated with self-care behaviours and glycaemic control among patients with T2DM.²¹ Self-efficacy is defined as 'people's judgment of their capabilities to organise and execute courses of action required to attain designed types of performance and expect the outcomes, is a pre-requisite of behaviour, [and] is considered as an independent part of basic personal skills'.²⁰ Regarding the process of self-care in diabetic patients, Mohebi et al.²² claimed that self-efficacy was crucial and contributed to 95% of disease control.

According to Cordova et al.,²³ self-efficacy may not only facilitate conceptual changes in learning through fostering confidence in

one's ability to gain understanding and change one's ideas, but it may also hinder conceptual changes through fostering confidence in one's own conceptions to the point of reluctance to accept alternative ideas. The likelihood for self-efficacy to facilitate conceptual changes in learning is influenced by the interplay between self-efficacy and other individual variables, such as confidence in prior knowledge, interest, and prior knowledge.²⁴ Therefore, knowledge on postpartum T2DM screening should be instilled early, at the time of GDM diagnosis, to ensure the effectiveness of self-efficacy, which should be emphasised towards the end of the pregnancy.

Surprisingly, most of the respondents had a negative attitude towards screening, with a non-significant inverse relationship between attitude and knowledge observed in the multiple logistic regression analysis; respondents having a negative attitude towards postpartum T2DM screening were expected to have good knowledge on the screening. According to a recent qualitative study conducted on Chinese women's attitudes towards postpartum interventions to prevent T2DM after GDM, 7 domains influencing women's attitudes towards future interventions were identified: experiences with the healthcare system during pregnancy, living in an enabling environment, the experience of T2DM in family members, knowledge of diabetes and perception of risk, concerns about personal and baby health, feelings and emotions, and lifestyle constraints.²⁵ The findings of the study indicated that those who had severe GDM, lived in an enabling environment, had health knowledge, and had experienced T2DM in family members expressed more favourable views on postpartum interventions and research participation to prevent T2DM after GDM.²⁵ Meanwhile, those who perceived themselves as having mild GDM and those with time or lifestyle constraints were less likely to participate.²⁵ Therefore, further

exploration of these data may explain the high proportion of respondents with a negative attitude in this study, and more targeted interventions can be planned and implemented.

Although this study highlighted important factors related to early detection of T2DM among postpartum GDM mothers, the findings may be limited by the cross-sectional study design and sampling of GDM mothers during the second trimester instead of the third semester, when postpartum T2DM screening is most likely to be emphasised to the mothers with GDM. Furthermore, the use of cluster sampling may also have limited an equal opportunity for GDM mothers from other mukims to be selected for the study. However, the findings are strengthened by the satisfactory response rate and the use of a validated and reliable questionnaire.

Conclusion

The findings revealed poor knowledge related to postpartum T2DM screening among GDM pregnant mothers who were involved in this study, which was predicted among those with low self-efficacy and secondary education as their highest education level. Educating mothers with GDM should be a continuous effort during antenatal follow-up to instil the mother's belief that they should execute certain necessary behaviours, particularly among those with a secondary education level or lower.

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Conflicts of interest

The authors declare no conflicts of interest relevant to this article.

How does this paper make a difference in general practice?

- Addresses an important, ongoing, highly preventable public health issue.
- Provides beneficial research findings for general practitioners on the importance of continuing education for women with GDM during antenatal care.
- Provides evidence for the need to focus on women with GDM of low education and self-efficacy.
- Assists future research on improving knowledge on 6-week screening, which has been inadequately explored.
- Creates awareness among health professionals in general on the low level of knowledge related to the 6-week diabetes screening.

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ORIGINAL ARTICLE

A cross sectional study on patient satisfaction and its association with length of consultation at the University Malaya Medical Centre Primary Care Clinic

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Abstract

Introduction: Patient satisfaction has been found to be a determinant of patient compliance to medical advice and treatment, medical service utilisation, the doctor–patient relationship, and continuity of care. Assessment of patient satisfaction can be used to evaluate health care services and identify areas to target for quality improvement.

Methods: A cross-sectional study was conducted to determine the satisfaction level of patients attending a primary care clinic and its associated factors. Participants' experience of time at the clinic, socio-demographic data, and personal health information were collected. The 18-Item Patient Satisfaction Questionnaire was used to determine patient satisfaction. Univariate and multivariate analyses were employed to identify the factors associated with patient satisfaction.

Results: We recruited 327 participants and 50.46% reported satisfaction. The highest satisfaction was reported in the communication domain (80.80% of the maximum score) and the lowest score was reported in the accessibility and convenience domain (66.40%). The only significant positive correlation with total patient satisfaction score was the difference between perceived and expected length of consultation.

Conclusion: The only independently associated factor was the difference between perceived and expected length of consultation; therefore, changing how time is spent during consultations may prove useful in improving patient satisfaction.

Introduction

Patient satisfaction with health care services is an important issue as patients are the recipients and consumers of these services. Satisfaction is an important determinant of patient compliance to the medical advice and treatment rendered, medical service utilisation, the doctor–patient relationship, and continuity of care.¹⁻⁴

Generally, factors that influence patient satisfaction can be categorised: (a) patient-related factors (e.g., age, race, gender, education level, and socioeconomic status), (b) medical personnel-related factors (e.g., technical skills, time spent during visit, communication skills, bedside manners), and (c) system-related factors (e.g., accessibility, facilities, appointments, referrals, and continuity of care).⁵

Length of time spent with the doctor is one of the strongest determinants of patient

satisfaction.⁶ The duration of time spent in consultations has shortened over the years, mainly due to increasing administrative work load of the physician and the emphasis on cost effectiveness of health services.⁷ Many studies have shown that when the time spent with the physician in ambulatory encounters is shortened, it may decrease both patient and physician satisfaction.⁸ Time is a key element in the formation of the patient–doctor relationships and should be regarded as a valuable resource in health care.

In Malaysia, patient satisfaction studies in primary care settings have been conducted over the last 10 years and have involved both government and private primary care clinics in different populations (i.e., urban, suburban, and rural populations). Several different instruments have been employed to evaluate patient satisfaction, such as SERVQUAL, Modified Patient Satisfaction Questionnaire III (PSQ III), Patient Satisfaction Questionnaire

II (PSQ II), and different cut-off points for satisfied patients have been used.⁹⁻¹² Generally, most of the studies reported a high level of satisfaction (78.8–93.1% satisfied patients)^{5,9,12}; two studies from Aizuddin et al. and Haliza et al. reported the proportion of satisfied patients as 27.5% and 19.4%, respectively.^{10,13}

Studies specifically investigating patient satisfaction and the time spent with physicians as a resource remain scarce,⁸ especially in the local setting. The aim of this study was to determine the patient satisfaction level and its association with the experience of time spent in the clinic and other factors for patients attending an academic primary care clinic.

Methods

Study design and setting

A cross-sectional study was conducted over 3 weeks from July 18, 2016, to August 5, 2016, in an academic primary care clinic in Kuala Lumpur, Malaysia. University Malaya Medical Centre (UMMC) Primary Care Clinic is a unique primary health care setting where the primary health care providers can order in-hospital investigations, as the clinic is attached to the UMMC, a tertiary care hospital.

Study population

The participants eligible for this study were all adult patients attending the UMMC primary care clinic (General Clinic)-Klinik Rawatan Utama (RUKA) during the study period. The General Clinic was chosen because the patients attending general clinics are more diverse and representative of the general population. Exclusion criteria were patients younger than 18 years of age, patients requiring emergency care, and patients who could not understand both English and Malay.

Sample size calculation

Sample size calculation was performed using Open Epi, a sample size calculator for finite populations. Based on a recent local study conducted by Aizuddin et al. in a primary care setting, the proportion of satisfied patients was 27.5%¹⁰; therefore, a sample size of 285 patients with a 95% confidence interval was used. Considering a 20% drop-out rate, the sample size was estimated to be 342. The study enrolled a total of 357 patients.

Sampling method

Participants were recruited using a systematic random sampling method. The first participant was selected randomly from a digit starting

from 0 to 9. Subsequently, every tenth patient was sampled based on the last digit of a four-digit queue number.

Study instruments

The study instrument was a structured data collection form consisting of two sets of questionnaires (Pre-consultation Questionnaire and Post-consultation Questionnaire) and one set of data collection forms for the actual consultation time.

The Pre-consultation Questionnaire consisted of two sections: the socio-demographic profile and the personal health and visit information of the participants. The Post-consultation Questionnaire consisted of two sections, including the perceived length of the consultation and a Short-form Patient Satisfaction Questionnaire (PSQ-18). Both questionnaires were self-administered.

The PSQ-18 was chosen because the instrument is clinically relevant to the study setting and population. The PSQ-18 was originally developed by Marshall and Hays and was derived from the PSQ-III.¹⁴ The PSQ-18 comprises 18 items answered on a five-point Likert scale ranging from 1 ('strongly agree') to 5 ('strongly disagree'). These items include general satisfaction (2 items), technical quality (4 items), interpersonal manners (2 items), communication (2 items), financial aspects (2 items), time spent with the doctor (2 items), and accessibility and convenience (4 items).¹⁴ The PSQ-18 subscales correlate well with their full-scale counterparts in the PSQ-III, with a generally acceptable internal consistency coefficient of 0.64–0.77.¹⁴ Moreover, the PSQ-III has been used extensively in patient satisfaction surveys and is validated for use in Malaysia.¹⁵⁻¹⁷

The data collection form for actual consultation time consists of a 2 x 5 table where the first column records the 'time in' and second column records the 'time out'. There are five rows indicating first to fifth time consultations for the same patient in the clinic on the same day. The attending doctors were directed to fill in the start time of consultation in the 'Time in' column and end time of consultation in the 'Time out' column in the first row of the table. If the attending doctor ordered investigations (e.g., x-ray, FBC) when the patient entered the consultation room for the second time, the attending doctors were directed to fill in the start time of the

consultation in the 'Time in' column and end time of consultation in the 'Time out' column on the second row of the table. The attending doctors were directed to follow the same procedure if the patient left and re-entered the consultation room for the third, fourth, fifth, or subsequent times. The form was collected at the end of the clinic session by the investigator. The investigator calculated the time spent in the consultation room by subtracting the 'time out' from the 'time in' for each row of the table. Then, the time spent for each consultation was summated to determine the actual length of the consultation.

Definition of the experience of time spent by patients in clinic variables

1. Expected length of consultation
This is the patient's expectation of the length of time that would be spent in consultation. This was determined before the patient consulted with the attending doctor.
2. Perceived length of consultation
This is the patient's perception of the time spent in consultation. This was determined after the patient consulted with the attending doctor.
3. Actual length of consultation
This is the actual duration of the consultation and was calculated by subtracting the 'time out' from the 'time in'. Then, the time spent in each consultation on the same day were summated to determine the actual length of consultation (in minutes).
4. Difference between perceived and expected length of consultation
This variable was calculated by subtracting the perceived length of consultation from the expected length of consultation (in minutes).
5. Difference between actual and expected length of consultation
This variable was calculated by subtracting the actual length of consultation from the expected length of consultation (in minutes).

Statistical analysis

All statistical analyses were performed using Statistical Package for Social Science (SPSS) version 23. Descriptive analysis was performed for all the variables in this study.

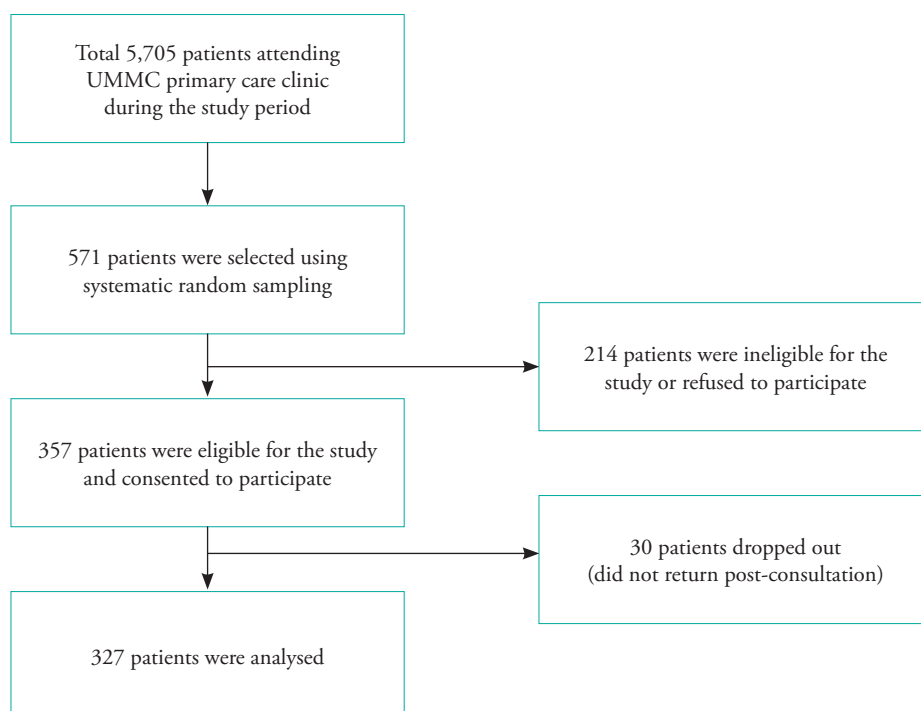
Outliers were checked for continuous data. A formal assessment for normality using the Kolmogorov–Smirnov test was performed for all continuous variables. If this formal method showed that the variables were not normally distributed, other methods of assessing normality were carried out, including comparing the mean and median, constructing a histogram overlaid with a normal curve, constructing a normal probability plot, and constructing a box and whisker plot. All the continuous variables were normally distributed, except for the total monthly household income variable.

The independent t-test or ANOVA test were used to compare the total patient satisfaction scores for categorical variables. Pearson's correlation test was employed to evaluate the association of the total patient satisfaction score with the continuous variables (normally distributed variables). Spearman's correlation test was employed to evaluate the association of the total patient satisfaction scores with total monthly household income (non-normally distributed variable).

A multiple regression model was employed to study the relationship between the total patient satisfaction score and the actual length of consultation, waiting time, the difference between the perceived and expected length of consultation, and the socio-demographic variables with a p-value <0.25 (age, gender, marital status, job status, and type of occupation). The 'job status' variable was recategorised into 'working' and 'not working', and the 'type of occupation' variable was recategorised into 'government sector' and 'non-government sector' in the multiple regression model.

Data collection

Data collection was conducted with the assistance of the triage nurses, clerks, enumerator, and doctors. The flow chart of the recruitment process is illustrated in **Figure 1**. The recruitment rate was 62.5%. From those patients recruited in the study, a total of 30 patients did not return after the consultation and were considered to have dropped out, making the drop-out rate 8.4%. The final total number of participants analysed was 327.

Figure 1. Flowchart of participant recruitment*Ethical approval*

This study was approved by the UMMC Ethics Committee (reference number 20163-2278) on April 15, 2016, before the commencement of the study.

Results*Socio-demographic profiles of the participants*

The mean age of this study's participants was 52 years, with a standard deviation of 17 years. There were slightly more female participants ($n=184$) than male participants ($n=143$), and more than two-thirds of the participants were married. Most of the participants were Malay (48.0%), followed by Chinese (25.1%), Indian (24.2%), and others (2.8%). Regarding employment, 45% of the participants were working and most of them worked in the private sector. Almost 90% of the participants had obtained at least a secondary level of education. The median total monthly household income was RM 2500 (Table 1).

Table 1. Socio-demographic characteristics of participants.

Participant profile	Number of participants, n	Percentage, %
Age (years)		
Mean + SD#	51.95 ± 17.32	
Range	18–87	
Gender		
Male	143	43.7
Female	184	56.3
Race		
Malay	157	48.0
Chinese	82	25.1
Indian	79	24.2
Other	9	2.8
Marital Status		
Single	74	22.6
Married	253	77.4
Job Status		
Working	147	45.0
Not working	92	28.1
Student	18	5.5
Retired	70	21.4

Participant profile	Number of participants, n	Percentage, %
Type of Occupation		
Government sector	51	15.6
Private sector	82	25.1
Self-employed	14	4.3
Unrelated	180	55.0
Highest Education Level		
Primary school	39	11.9
Secondary school	147	45.0
Diploma	55	16.8
Degree	62	19.0
Postgraduate degree	17	5.2
No formal education	7	2.1
Total Monthly Household Income (RM)		
Median (IQR*)	2500 (750–5000)	
Range	0–30000	

standard deviation

* interquartile range

Patient total satisfaction score and its domains

The mean total patient satisfaction score was 67.18, which was almost three-quarters (74.64%) of the maximum score (90). In this study, all the domains achieved >75% of the maximum score, except for the 'time spent with doctor' domain and 'accessibility and convenience' domain, which only achieve 68.4% and 66.4% of the maximum score, respectively.

Table 2. Patient total satisfaction score and its domains

Variables	Mean score $\pm$ SD	Range	Maximum score
Total Satisfaction Score	67.18 $\pm$ 6.76	40–87	90
General Satisfaction	7.97 $\pm$ 1.16	2–10	10
Technical Quality	15.28 $\pm$ 1.94	8–20	20
Interpersonal Manner	7.87 $\pm$ 1.20	3–10	10
Communication	8.08 $\pm$ 1.19	2–10	10
Financial Aspect	7.53 $\pm$ 1.34	4–10	10
Time Spent with Doctor	6.84 $\pm$ 1.26	4–10	10
Accessibility and Convenience	13.28 $\pm$ 2.23	6–20	20

Experience of time spent by patients in the clinic

The mean expected length of consultation and perceived length of consultation were 15.85 minutes and 14.39 minutes, respectively, while the actual length of consultation was 16.43 minutes. The mean waiting time was 81.13 minutes, with a standard deviation of 3.25 minutes. The difference between perceived and expected length of consultation ranged from -110 minutes to 50 minutes, with a mean score of -1.46 minutes. The difference between the actual and expected length of consultation ranged from -101 minutes to 61 minutes, with a mean score of 0.58 minutes.

Relationship between experience of time spent by patients in the clinic and total patient satisfaction score

The difference between perceived and expected length of consultation demonstrated a significant positive linear relationship with total patient satisfaction score (correlation coefficient: 0.151, $p=0.006$). Although the perceived length of consultation, actual length of consultation, and difference between the actual and expected length of consultation showed a positive linear relationship with total patient satisfaction score, these findings were not significant (Table 3).

Table 3. Relationship between the experience of time spent by patients in the clinic and total patient satisfaction score

	Correlation coefficient value	p-value
Expected Length of Consultation*	-0.059	0.287
Perceived Length of Consultation	0.097	0.081
Actual Length of Consultation [#]	0.065	0.245
Waiting Time	-0.034	0.539
Difference Between Perceived and Expected Length of Consultation ⁺	0.151	0.006
Difference Between Actual and Expected Length of Consultation ⁺	0.094	0.089

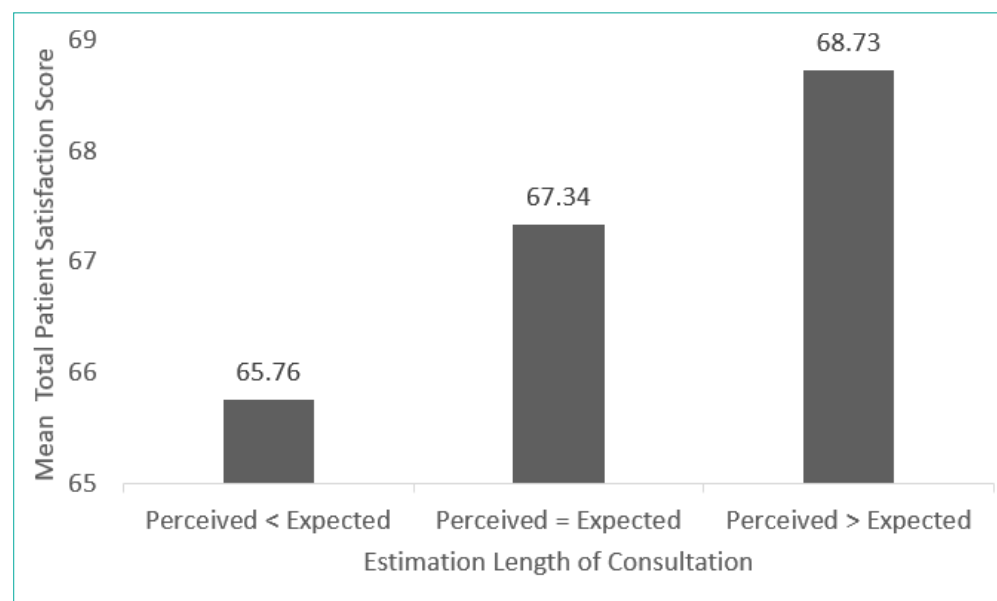
* one of the cases with outliers was excluded from data analysis (n=326)

[#] one of the cases with outliers was excluded from data analysis (n=326)

⁺ two of the cases with outliers were excluded from data analysis (n=325)

Association between total patient satisfaction score and estimated length of consultation

The patients who perceived the length of consultation to be longer than the expected length of consultation had a significantly higher mean total satisfaction score as compared with the patients who perceived the length of consultation to be equal to or shorter than the expected length of consultation (**Figure 2**).

Figure 2. Association between total patient satisfaction score and estimated length of consultation.

Association between total patient satisfaction score and socio-demographic characteristics, personal health, and visit information of participants

There was no significant association between total patient satisfaction score and the socio-demographic characteristics, personal health and visit information of the participants, except marital status ($p=0.026$). Married participants had a significantly higher mean total patient satisfaction score as compared with single participants (**Table 4**).

Table 4. Association between total patient satisfaction score and socio-demographic characteristics of participants.

Participant profile	Number of participants, n (%)	Mean total satisfaction score	p-value
Gender			
Male	143 (43.7)	67.22	0.173 [#]
Female	184 (56.3)	67.15	
Race			
Malay	157 (48.0)	67.88	0.257*
Chinese	82 (25.1)	66.37	
Indian	79 (24.2)	66.49	
Other	9 (2.8)	68.56	
Marital Status			
Single	74 (22.6)	66.05	0.026[#]
Married	253 (77.4)	67.51	
Job Status			
Working	147 (45.0)	67.20	0.100*
Not working	92 (28.1)	66.47	
Student	18 (5.5)	64.94	
Retired	70 (21.4)	68.64	
Type of Occupation			
Government sector	51 (35.2)	68.12	0.211*
Private sector	82 (55.1)	66.44	
Self-employed	14 (9.7)	68.36	
Highest Education Level			
Primary school	39 (11.9)	68.00	0.735*
Secondary school	147 (45.0)	66.62	
Diploma	55 (16.8)	67.04	
Degree	62 (19.0)	67.65	
Postgraduate degree	17 (5.2)	68.29	
No formal education	7 (2.1)	68.86	

Independent t-test

*ANOVA test

Association between total patient satisfaction score and associated factors

By using a multiple regression model, we determined that the only factor with significant positive correlation with total patient satisfaction score was the difference between perceived and expected length of consultation (regression coefficient: 0.110, $p=0.02$). The VIF of all examined factors was less than 5, showing no evidence of multicollinearity problems (Table 5).

Table 5. Association between total patient satisfaction score and associated factors (multiple regression model).

Variables	Regression Coefficient (b)	p-value	95% Confidence Interval	Collinearity Statistics (VIF)
Constant	69.326			
Age	0.047	0.119	-0.012–0.106	1.962
Gender	-0.013	0.986	-1.535–1.509	1.068
Marital Status	-0.158	0.887	-2.350–1.528	1.583
Job Status	-0.358	0.709	-2.244–0.106	1.648
Type of Occupation	-1.827	0.126	-4.173–0.519	1.342
Actual Length of Consultation	0.021	0.685	-0.079–0.120	1.140
Waiting Time	-0.007	0.531	-0.030–0.016	1.029
Difference Between Perceived and Expected Length of Consultation	0.110	0.020	0.018–0.202	1.148

Final Model Equation

Total Patient Satisfaction Score = 69.326 + 0.110* (Difference Between Perceived and Expected Length of Consultation)

Discussion

The only significant positive correlation with total patient satisfaction score in this study using the multiple regression model was the difference between perceived and expected length of consultation. This finding was consistent with a study conducted by Lin et al. where the patient's perception of time spent with the physician that met or exceeded the expected time was associated with a significantly higher patient satisfaction score.¹⁸ Another study by Cape et al. showed that patients who overestimated the time spent with their physician had a higher satisfaction score, suggesting that patients' perception of time spent with their physician had a greater bearing on patient satisfaction than the actual time spent with the physician.¹⁹ Therefore, patient satisfaction is dependent on how long the patient perceives the consultation to have lasted and their expectation of the length of consultation.

The patient's experience with the consultation is crucial for the length of consultation perceived by the patient. If the consultation experienced by patients is positive, they perceive the length of the consultation to be longer than it actually is.¹⁹ This observation brought about the concept of 'perceived quality of consultation'. The perceived quality of consultation is influenced by the setting of the clinic and both the verbal and non-verbal behaviour of the treating physician.²⁰ The expectation of the length of consultation may represent the expectation of how the consultation takes place indirectly. A study by Ogden et al. reported that dissatisfaction with the emotional aspects of the consultation and lower intention to comply with doctors' recommendations were significantly correlated with the patient's preference for more time during the consultation. Therefore, changing how the time is spent in consultation (e.g., by listening to patients and trying to understand their needs) could improve the patient's satisfaction with consultation length rather increasing the actual length of the consultation.²¹ This hypothesis is further supported by a meta-analysis by Lemon and Smith suggesting that actual length of consultation was not the variable responsible for improving patient satisfaction, but rather the exploration of the patient's psychosocial factors.²² Therefore, it is crucial to ascertain the expectations and psychosocial needs of the patient during each consultation and to manage them accordingly to achieve higher patient satisfaction.

The mean total patient satisfaction score in this study was 67.18, which was 74.64% of the maximum score (90). The proportion of satisfied patients was 50.46% when using mean total satisfaction score as the cut-off, which was much lower than most local studies with reported proportions of satisfied patients ranging from 78.8% to 93.1%.^{5,9,12} However, several local studies on patient satisfaction reported lower satisfied patient rates, ranging from 19.4% to 27.5%.^{10,13} The differences can partly be attributed to the different patient satisfaction study instruments used, such as SERVQUAL, PSQ III, PSQ II, and different cut-off points for satisfied patients. The lower reported satisfaction score could also be a result of issues in the health care delivery, especially in the domains of accessibility, convenience, and time spent with the doctor.

In this study, the communication domain had the highest satisfaction score, with 80.80% of the maximum score. In contrast, the accessibility and convenience domain had the lowest score, with only 66.40% of the maximum score. These findings are consistent with the findings of another study conducted in a university clinic, Universiti Kebangsaan Malaysia Medical Centre (UKMMC) Primary Care Clinic, where 96.5% of the respondents were satisfied with the 'doctors' domain, which mainly examined the doctors' communication skills (i.e., social skills, information gathering skills, and information giving skills); in contrast, only 68.1% of the respondents were satisfied with the 'accessibility' domain.⁵ Another study conducted in a government primary care clinic reported contradicting results: 61.1% of the respondents were satisfied with the 'accessibility' domain, 35.1% of the respondents were satisfied with the 'interpersonal manner' domain, and only 6.7% of the respondents satisfied with the 'continuity of care' domain.¹¹ Both UMMC Primary Care Clinic and UKMMC Primary Care Clinic are training facilities for postgraduate trainees in Family Medicine; most of the doctors at these two facilities are master students trained to communicate effectively with patients. This may have contributed to the higher satisfaction score in the 'communication' and 'doctors' domains as compared with the scores of the government primary care clinic of the Ministry of Health. In terms of accessibility, the government primary care clinic achieved a higher satisfaction score as these clinics are located within the community and are therefore close to the patients' homes.

Appointment intervals are also usually shorter as these clinics. Both the UMMC Primary Care Clinic and UKMMC Primary Care Clinic are located in busy city areas and appointment intervals are much longer due to high patient load.

This study examined the association of expected, perceived, and actual length of consultation with patient satisfaction in a primary care clinic. The difference between perceived and expected length of consultation had a significant positive correlation with patient satisfaction and highlights the importance of focusing on ways to improve the patient's perception of the consultation time and managing the patient's expectations of consultations. By doing so, the patient's satisfaction will be improved and thus a better quality of health care service can be rendered. The limitations of this study are its low recruitment rate of 62.5 % and that its results are not generalisable to the entire population. There may also have been observation bias, as the doctors who participated were aware that they were being studied. The data collection was completed in 2016, therefore the results are not recent.

Further studies should examine factors that influence patients' expectations and

perceptions of consultation quality and duration. Our findings showed that quality of time in consultation is important in clinical practice; therefore, we recommend that communication with patients be improved by implementing skill workshops for doctors.

The proportion of satisfied patients using the mean as the cut-off point was lower than in comparable studies. This indicates that there are issues that must be corrected, especially in the domain of accessibility and convenience. The perceived length of consultation exceeding the expected length of consultation was the only significant factor associated with high patient satisfaction. Therefore, changing the way the time is spent in consultation might be a more feasible way to improve patient satisfaction rather than increasing the actual length of the consultation.

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Conflicts of interest

The authors declare no conflicts of interest.

How does this paper make a difference in general practice ?

- Based on this study, the perceived length of consultation exceeding the expected length of consultation was significantly associated with a higher satisfaction score. Changing how the time is spent in consultation (e.g., by listening to patients and trying to understand their needs) rather than increasing the length of the consultation might be a more feasible way to improve patient satisfaction in view of time constraints during busy clinic sessions.
- The development of a system where the patients can record the expected length of consultation before their consultation might be useful.

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ORIGINAL ARTICLE

The profile of headaches and migraine amongst medical students and its association to stress level, disability and self-management practices

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Abstract

Introduction: Migraine is the most common headache affecting young people that impairs their functional ability. This study aimed to determine the frequency of migraines among Malaysian medical students, the association between migraines, stress level, and functional disability among these students, and describe their self-management practices.

Methods: A cross-sectional study was conducted among medical students in a private medical school in Penang state. All medical students in the study site were screened for the presence of headache symptoms and the diagnosis of migraine using a self-administered questionnaire comprising International Headache Society (IHS) diagnostic criteria. Other domains that were assessed were perceived stress level and functional disability, which were measured using the Perceived Stress Scale and the Headache Impact Test-6 (HIT-6), respectively. The students' self-management practices for their headaches were determined using a descriptive survey.

Results: A total of 374 medical students participated in this study and 157 (42%) students reported experiencing headaches. More than half ($n=97$, 61.8%) of those with headaches fulfilled the IHS criteria for migraines. Migraines were significantly associated with functional disability compared with non-migraine headaches ($p<0.001$); however, no significant difference in stress levels were reported between the two groups. During migraine attacks, sleep ($n=73$, 60.33%) and self-medication ($n=56$, 69.14%) were the most common self-management practices. Only 11.46% of the 157 students with headaches consulted a doctor.

Conclusion: A high proportion of medical students suffered from headaches and more than half of them had migraines. Migraine headaches were associated with significant functional disability. Very few students sought medical consultation and most students chose to self-manage their headaches.

Introduction

Headache is the second leading cause of disability globally.¹ The prevalence of headaches among adolescents ranged between 8% and 88% in studies conducted in several countries using different tools.² Headaches affect young people academically in terms of performance on examinations and study sessions in addition to having a negative impact on daily and social activities that would aid in relaxation; this in return leads to a vicious cycle of increasing headache incidence.³

Headache was the most common cause of disability across all ages and was ranked 14th in the 2019 Global Burden of Disease Study Collaborators; migraine was the top 3rd cause of disability among young people (15–49 years old) according to the 2016 Global

Burden of Disease Study Collaborators.⁴ Migraine sufferers have impaired academic performance and social life activities, predominantly activities involving family and leisure.^{5,6} The impact of migraines can be reduced if they are correctly diagnosed and appropriately managed or prevented.

Migraine headaches are known to be triggered by stress, loud auditory stimuli, fatigue, fasting, and menses; to some migraineurs, the triggers are either excessive or insufficient sleep.⁷ Migraine headaches are commonly associated with a lack of sleep and stress.⁸ Therefore, taking the appropriate precautions to avoid triggers can prevent migraine headaches and reduce their related impacts.

In general, migraine sufferers experience severe functional disability compared with

non-migraine headache sufferers.^{5,9} Migraine sufferers also experience a high amount of work-related disability and absenteeism; however, a majority do not seek help.¹⁰ A study on healthcare workers in 52 primary health care centres in Abha City, Saudi Arabia found that nearly 48% of 102 resident doctors and specialists reported suffering migraine headaches with moderate to severe disability (Migraine Disability Assessment [MIDAS] score 2–4); 94% of the doctors reported having moderate to poor quality of life as compared with nurses, pharmacists, and other allied health workers.¹¹

Medical students in Malaysia are aged between 19 to 25 years, representing late adolescence. They are typically viewed as being susceptible to stress due to their learning environment. As part of their training, their hectic schedules may result in a lifestyle that predisposes them to migraine headaches, such as excessive caffeine intake, missing meals, lack of sleep, and high psychological stress.⁵ This environment results in significant disability and affects their academic performance and clinical training as future healthcare professionals. Previous studies have shown that migraines are associated with impaired academic performance and social life.^{5,6} Medical students with migraines were often found to have other co-morbid conditions, such as depression.⁶

Although the prevalence of migraines in the Malaysian general population was estimated to be 9%,¹² it may be higher among medical students considering that the reported prevalence of migraines among medical students in other countries ranges from 12.2% to 27.9%.^{13,14} Unfortunately, migraines may be underdiagnosed, even among medical students. A study conducted on medical students in South India found that, despite nearly 11% experiencing disability due to migraines, only 2.6% were aware that they had migraine headaches.⁵ To our knowledge, there are no published studies on the prevalence of migraines among medical students in Malaysia. The association between migraines and psychological stress and functional disability should also be examined. Migraine management can be classified into management for acute migraines and preventive management.¹⁵ Migraine sufferers benefit from structured behaviour modification therapy that

incorporates recognition and avoidance of triggers.¹⁶ Pharmacological prophylaxis may be indicated for those with recurrent disabling migraine attacks. However, most sufferers prefer to take a quick reliever medication, such as non-steroidal anti-inflammatory drugs, instead of taking long-term prophylactic medications.¹⁷

Migraine headaches in medical students and their association with stress, functional disability, and self-management practices have not been explored in the local population. Therefore, this study aimed to determine the frequency of migraines among medical students with headaches and to explore their management practices, including self-management. This study also aimed to determine the association between migraines and stress level, functional disability, and self-management practices.

Methods

A cross-sectional study was conducted from June 2013 to November 2013 in a private medical college in Penang state. The inclusion criteria were medical students aged 18 years or older who had experienced headaches in the preceding 3 months. Students who were absent during the data collection period were excluded from this study. Based on an expected frequency of migraines among medical students of 13.9%,¹⁸ a 95% confidence interval and 20% non-response rate, the minimum sample size required to determine the frequency of migraine headache was 222 students.

Data collection

During the data collection period, 514 medical students were enrolled at the college. After receiving approval from the college administrator, all students registered during the study period were invited to participate using a universal sampling technique. Universal sampling was used to allow all students to be screened for the inclusion and exclusion criteria, and to facilitate data collection as all the students were available at a fixed time. Students were approached during their break time between lectures in their lecture halls. They were briefed about the study and those who agreed were requested to submit their written consent forms.

Study instrument

Students were given a set of screening

questions to identify those who suffered from headaches over the last 3 months. Of the 374 students who agreed to participate, 157 (41.2%) students fulfilled the International Headache Society (IHS) criteria and identified as having headaches. These students completed a checklist of the IHS diagnostic criteria for headaches. The students with headaches were further classified into 'migraine headache' or 'non-migraine headache' using the symptoms checklist. The items for diagnosis were 'duration of the headache', 'headache fulfilling at least two out of four criteria of characteristics of migraine', and 'one of two associated symptoms and headache not caused by other medical conditions'. By identifying students who had headaches and by administering the International Classification of Headache Disorders (ICHD) diagnostic criteria, we were able to make a possible diagnosis of migraine, which was subsequently confirmed by clinical assessment of the students. Students with headaches also completed a self-administered questionnaire that collected data on their socio-demographic profiles, self-management practices, functional disability using the 6-Item Headache Impact Test (HIT-6),¹⁹ and stress level using the 10-Item Perceived Stress Scale (PSS).²⁰ A non-commercial licence (QM017606) for use of the HIT-6 questionnaire was obtained from OptumInsight Life Sciences, Inc.

The HIT-6 assesses the impact of headaches on patients regarding pain, social role limitations, cognitive functioning, psychological distress, and vitality. The internal consistency reliability for HIT-6 was 0.89, alternate forms were 0.9, and the test-retest reliability was at 0.8. Possible scores for HIT-6 ranged from a minimum of 36 to a maximum of 78; higher scores represented higher level of disability.¹⁹ HIT-6 scores ≤ 49 indicated little to no impact, score of 50–55 indicated moderate impact, scores of 56–59 indicated substantial impact, and scores ≥ 60 indicated severe impact.

The PSS measures the perception of stress and the degree to which life situations are viewed as stressful. It has good internal consistency reliability, with a Cronbach- α of 0.78. The minimum possible score for PSS is 0 and the maximum possible score is 40. Higher scores reflect higher stress levels.²⁰ Respondents who scored <13 were categorised as having a low stress level, those who scored 14–26 were

categorised as having moderate stress, and those who scored ≥ 27 were categorised as having severe stress.

Both questionnaires were not translated as medical students were assumed to have sufficient command of English to understand the original English version of the questionnaires.

For self-management, students were requested to respond to a checklist of nine self-management practices that was developed based on local guidelines on headache self-management²¹ and expert opinions. Respondents were allowed to choose as many self-management practices as were relevant, including their decision to seek medical consultation.

In addition, the students were requested to provide information on the preferred medical consultation, either private or government doctors and specialist or general practitioners. The full set of questionnaires were pre-tested on 10 students prior to conducting the study. There were no identified issues and the students were able to understand and answer the questions.

Statistical analysis and ethical consideration

Data was analysed using IBM SPSS Version 22.0. Descriptive analyses were reported as frequencies, percentages, and mean or median, where appropriate. Bivariate inferential analysis was performed using the chi-squared test, Fisher's Exact test, and Student's t-test. The level of significance was set at a p-value of 0.05.

All the students received a verbal and written explanation regarding the study and its objectives before enrolment. Only those who provided written informed consent were screened for inclusion in the study. The respondents' information was handled in strict confidentiality.

Students who were identified to have migraines were offered a referral to the nearest health clinic for further assessment and treatment. Students found to have chronic migraines with severe impact were offered a referral to the nearest neurology specialist clinic. Students with non-migraine headaches were offered a formal assessment by the site investigator and were referred to the nearest health clinic or hospital accordingly.

Results

A total of 374 students were screened for headaches, with a response rate of 72.8%. Of these students, 157 (42%) reported experiencing headaches in the preceding 3 months. Students who had headaches were predominantly female (n=113, 71.9%) and Malays (n=109, 69.4%), and their ages ranged from 18 to 26 years old. The frequency of migraines over all medical students who were screened was 25.9%. Among the students with headaches, migraines (61.8%) were more common than non-migraine headaches (38.2%).

Migraines were significantly more common in female students (n=75, 66.4%) compared with male students (n=22, 50%) ($X^2=2.82$, $p=0.06$).

Table 1. Sociodemographic distribution of migraine headaches and non-migraine headaches.

Demographic characteristic		Total (N=157)	Migraine (N=97)		Non-migraine (N=60)		X ² / t-test	p-value
Age (years)	Mean (SD)	21.12 (1.49)	21.15 (1.59)		20.82 (1.24)		1.41	0.16
			N	%	N	%		
Gender	Male	44	22	50.0	22	50.0	2.82	0.06
	Female	113	75	66.4	38	33.6		
Race	Malay	109	72	66.1	37	33.9	1.46	0.7*
	Non-Malay	48	25	52.1	23	47.9		

*Fisher's exact test was performed for race because 6 cells (50%) had an expected count < 5 in the chi-square analysis for race.

There was no significant difference in gender, ethnic distribution, or age between students with migraine and non-migraine headaches.

Perceived stress levels among the migraine and non-migraine respondents

The maximum possible range for the PSS score was from 0 to 40. The mean PSS score for the migraine group was 21.1 (SD=4.9) and the mean PSS score for non-migraine group was 18.9 (SD=5.1). The difference between the groups was not statistically significant ($p=0.14$).

Functional disability among the students with migraine and non-migraine headaches

In terms of functional disability evaluated using the HIT-6, the possible range of scores was from 36 to 78, with higher scores representing a higher level of disability. Students with migraines had a significantly higher functional disability score (mean score 60.70, SD= 5.8) compared with non-migraine headaches (mean score 56.50, SD=7.5) ($t=3.94$, $p<0.001$).

Self-management practices among migraine and non-migraine respondents

In general, most students with headaches tended to self-medicate. In total, only 69 students (66.09%) sought consultation with doctors because of their headaches; they preferred to consult primary care doctors 66 (95.6%) rather than hospital specialists. Self-management practices among the students with headaches are illustrated in **Table 2**.

Sleep and using painkillers were the two most preferred self-management practices among students with either migraine or non-migraine headaches. A higher proportion of students with non-migraine headaches would do nothing ($p<0.01$), while a higher number of students with migraine headaches would self-medicate using painkillers, turn off loud noises, and turn off electronic devices whenever they had an attack compared with their counterparts ($p<0.05$). Only a few students would see a doctor (n=18/157, 11.46%) or take traditional medications (n=18/157, 11.46%).

Table 2. Self-management practices among migraine and non-migraine respondents (N=157).

Self-management practice	Migraine (N=97)	Non-migraine (N=60)	Overall (N=157)	X ²	p
	N (%)	N (%)	N (%)		
Sleep	73 (75.26)	48 (80.00)	121 (77.07)	0.47	0.49
Take their own painkillers	56 (57.73)	25 (41.67)	81 (51.59)	4.02	0.02
Turn off loud noises	43 (44.33)	17 (28.33)	60 (38.21)	4.20	0.02
Rest in a dark room	37 (38.14)	17 (28.33)	54 (34.39)	1.58	0.21
Turn off electronic devices	38 (39.18)	14 (23.33)	52 (33.12)	4.20	0.01
Do nothing	9 (9.28)	14 (23.33)	23 (14.65)	5.85	0.004
See a doctor	10 (10.31)	8 (13.33)	18 (11.46)	0.33	0.56
Take traditional medicine	12 (12.37)	6 (10.00)	18 (11.46)	0.21	0.65
Others	8 (8.25)	5 (8.33)	13 (8.28)	0.01	0.99

Discussion

Our study revealed a high proportion of medical students who were suffering from migraine headaches (61.8%) as compared with non-migraine headaches (38.2%). The frequency of migraines among all medical students who were screened was 27.5%, which was comparable to prior studies. Previous studies on medical students abroad showed a prevalence of migraine headaches ranging from 27.9% to 42%.^{5,14} The difference could be explained by the difference in the exclusion criteria, whereby one study excluded medical students who had mild headaches for the past 1 year,⁵ while the other study focused on students having headaches with disability.¹⁴ Therefore, the proportion of migraines in these two studies might have been under-reported. In contrast, our study included all types of headaches experienced in the past 3 months.

The interaction between stress and migraines has been proposed to be bidirectional.²² Increasing allodynia in migraines causes stress to the sufferers and thus affects disability.²³ Stress is a known triggering factor, causing a vicious cycle for the development of migraines.¹³ Stress has been observed as a known trigger for migraine headaches affecting medical students.^{5,7} Medical school being a generally stressful environment affects those suffering from migraine headaches more than those with non-migraine headaches. However, the perceived stress levels were equal between both groups in our study, indicating that they were exposed to similar levels of stress.

In terms of functional disability, students with migraines reported significantly higher disability than students with non-migraine

headaches. This observation confirms the findings of earlier studies involving medical students where students with migraines were significantly affected in terms of their daily academic performance, working activities and, social lives.^{5,18,24}

Self-care management strategies used by medical students with migraine headaches to relieve their headaches in this study were taking painkillers, controlling the noise in the environment, turning off their electronic devices, and sleeping or resting in a dark room. Students with non-migraine headaches mostly chose sleep as their self-management, and significantly fewer took painkillers.

In both groups, students preferred to sleep when experiencing a headache, and only a small proportion of the students would see a doctor for their headache. Lack of sleep was reported as the most common trigger for migraine among medical students^{7,14}; therefore, the sufferers would try to make up for lack of sleep. Their headaches were relieved with sleep.¹⁴

The second most common self-management practice was self-medication using pain killers, especially among the migraine sufferers. Self-medication was seen as a common practice in a previous study, as the sufferers perceived that their illnesses were mild and the painkillers could quickly relieve the pain.³ Medical students preferred to self-medicate to save both time and cost.²⁵ Their training and medical knowledge could have made the medical students more confident in self-medicating with analgesics for their headaches.^{26,27} Medical students who were younger than 20 years of age were significantly more likely to self-medicate as

with to older medical students.²⁹ However, knowledge of the safety of analgesics was only found to be increased among those who were already in their senior years.²⁸ Only a small proportion of the students would see a doctor for their headaches and their awareness of the safety of self-medication may be considered insufficient if they wished to self-medicate with analgesics instead of seeking help.

Limitations

Our study had several limitations. This was a cross-sectional study, which is not suited to demonstrate causality. The study population was limited to medical students studying in Penang state and, therefore, the results of this study may not be a representative of the general population of other medical students in this country. While screening the students for headaches, we may have missed some students who had acephalgic migraines; however, this condition is very rare. Furthermore, we aimed to determine the proportion of migraine headaches among those with headaches. Only bivariate analysis was conducted for this study. The number of students with migraines may be under-estimated, as those who did not have migraines in the preceding 3 months were not accounted for. In addition, the diagnosis of migraine was based on a self-reported symptom checklist and the severity of the migraines was not assessed.

This study did not explore the self-management practices that would influence the impact of migraines on the students, such as sleep quality, sleep pattern, types of medications and painkillers, due to limited resources available to collect the data.

Strengths of the study and recommendations

This study provides new data on the prevalence of migraines among medical students in Malaysia and their self-management practices. The study should be replicated in other

medical schools in Malaysia to obtain a more accurate representation of all medical students in the country. Assessment of the severity of migraines and confirmation of the diagnosis by a clinician should be performed to obtain more information regarding the magnitude of this problem among medical students. A follow-up study on the prevalence of migraines among medical doctors and their severity may also be beneficial to complement the information obtained from this study.

This study could be expanded to identify the different subgroups of migraines and other common causes of primary headaches, such as tension headaches and cluster headaches. Multivariate analyses to control for possible confounding factors would be invaluable in identifying the independent associations of migraines and the risk factors.

In conclusion, a high proportion of medical students suffered from migraines. Students with migraine headaches had significantly higher functional impact compared with those with non-migraine headaches. The preferred self-management practices among migraineurs were sleeping, taking painkillers, controlling the noise in the environment, and resting in a dark room. Sleeping or self-medicating were the preferred methods of self-management to relieve their headaches.

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Conflicts of interest

The authors report no conflicts of interest.

How does this paper make a difference in general practice ?

- It is important to identify and diagnose migraines in medical students with headaches because they may suffer from functional disability due to the migraines.
- Appropriate self-care practices can be taught to migraine sufferers, such as avoiding triggering factors.
- Self-medication practices among medical students were commonly observed in this study. The appropriateness of the self-medication practices should be evaluated.
- Non-migraine headaches should be assessed appropriately using IHS criteria.

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ORIGINAL ARTICLE

Prevalence and factors associated with psychological distress among adult patients with hypertension in a primary care clinic: A cross-sectional study

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Abstract

Introduction: Psychological distress worsens the control of hypertension. This study aims to fill the knowledge gap and evaluate the prevalence and factors associated with depression, anxiety, and stress among patients with hypertension in a primary care clinic.

Methods: A cross-sectional study was conducted at Klinik Kesihatan Bandar Jerantut on hypertensive patients using a systematic random sampling method. Data were collected from 391 hypertensive patients using a self-administered questionnaire. Multiple logistic regression analysis was performed to identify the associated factors.

Results: The response rate was 99.5% (389/391). The mean age of respondents was 60.1 years and 44.7% were male. The prevalence of psychological distress was the highest at 28.8%, followed by anxiety (21.3%), depressive (16.2%), and stress symptoms (13.9%). Uncontrolled blood pressure was significantly associated with depressive (OR: 6.4; 95% CI: 3.32–12.28), anxiety (OR: 4.9; 95% CI: 2.75–8.82), and stress symptoms (OR: 6.3; 95% CI: 3.06–12.98). Worry about the complications of hypertension was significantly associated with depressive (OR: 4.5; 95% CI: 2.08–9.94), anxiety (OR: 10.8; 95% CI: 4.15–28.17), and stress symptoms (OR: 5.3; 95% CI: 2.14–13.22). Other associated factors were physical inactivity, employment, lack of formal education, and low household income.

Conclusion: A quarter of hypertensive patients experienced psychological distress in terms of depressive, anxiety, or stress symptoms. We recommend screening for psychological distress among high-risk hypertensive patients, especially those cannot achieve adequate blood pressure control or those who are worried about the complications of hypertension.

Introduction

The worldwide prevalence of hypertension was 26.4% in 2000 and it is expected to rise to 60% in 2025.¹ In Malaysia, the prevalence of hypertension is 29.7%.² Among the patients who were aware of their hypertension, only 33.3% had their hypertension under control.² Hypertension influences the risk of adverse cardiovascular events; regardless of the severity of the hypertension, higher blood pressure is associated with a higher risk of adverse events.³

Psychological distress is a risk factor for hypertension.⁴ The American Psychological Association (APA) describes psychological distress as variations of mood associated with painful physical and mental symptoms; it is generally measured as anxiety and depression.⁵ Liu et al. concluded that the relationship between psychological stress and

hypertension was bidirectional; psychological stress was associated with an increased risk of hypertension, and hypertensive patients had a higher incidence of psychosocial stress compared with normotensive patients.⁴

Hypertension can be associated with a variety of psychological distress symptoms, as described in the perception of hypertension management study (Edvantage 360°).⁶ In this study, the majority of respondents were very worried about hypertensive complications, such as stroke, heart disease, and kidney disease. Psychological distress leads to poor medication adherence and poor self-care, causing poor hypertension control in the long term.⁷ This relationship delineates why uncontrolled blood pressure is associated with depressive symptoms.^{8,9} Moreover, the study found that psychological interventions were

able to lower blood pressure levels and improve quality of life.¹⁰

According to the literature, the prevalence of depression among hypertensive patients is 26.8%,¹¹ whereas the prevalence of anxiety symptoms among hypertensive patients varies widely, ranging from 8.9% to 55.3%.¹² Studies on stress symptoms in hypertensive patients are scarce. Among hypertensive patients in Ghana, the prevalence of stress symptoms was reported to be 35%.¹³

Ageing has been associated with higher odds of depression and anxiety in hypertensive patients, especially in those over 60 years old and those who experienced a longer duration of hypertension, possibly due to increased exposure to the disease.^{8,9,14,15} Female gender has also been associated with depressive and anxiety symptoms.^{8,9,15,16} This association is likely due to the differences in response towards stressors due to hormonal and physical factors.¹⁷ Gebre et al. and Ashok et al. found a positive association between family history of depression and depressive symptoms, suggesting that depressive symptoms are influenced by genetic inheritance.^{8,9} Furthermore, depressive and anxiety symptoms have been associated with lower socio-economic status: being unemployed, having a low income, and having a lower educational level.^{14,16} Lower socio-economic status limits access to various resources and thus increases the risk of depression.¹⁸ The same mechanism might also lead to anxiety. Smoking has also been associated with higher odds of depressive and anxiety symptoms^{14,15}; it is likely a maladaptive coping mechanism to overcome depression and stress.¹⁹

Despite the important role of psychological distress in influencing blood pressure control among hypertensive patients, there is a paucity of relevant studies in Malaysia. The existing studies focus only on a specific group of hypertensive patients, such as the elderly and patients in hospital settings, and the studies are not generalisable to all hypertensive patients.^{20,21} Moreover, most of the studies are conducted on hypertensive patients with comorbidities, such as stroke, heart disease, and diabetes mellitus. These diseases could have a more significant impact on psychological distress as they are more disabling than hypertension, which is usually asymptomatic. Therefore, our study focuses on

hypertensive patients without comorbidities, minimising the confounding factors.

Our objective was to examine the prevalence of psychological distress (depression, anxiety, and stress) among adult hypertensive patients in a primary care clinic and its associated socio-demographic factors and clinical characteristics.

Methods

Study design and setting

A cross-sectional study was conducted at Klinik Kesihatan Bandar Jerantut (KKBJ) in Jerantut, Pahang, Malaysia. Jerantut town has a population of about 91,000 people, as of 2010²²; therefore, it is classified as an urban area according to the Department of Statistic Malaysia. KKBJ is the most extensive primary health clinic in district Jerantut, with a daily patient load of around 400 people. It also receives patients from the surrounding rural areas. Patients visiting this health clinic are Malay, Chinese, Indian, and Orang Asli, which is reflective of the constitution of the population of Malaysia. Data collection occurred from 13 July 2020 to 3 September 2020. Our study was registered under the Medical Research Register (NMRR) (ID: NMRR-19-2620-48946). Ethical clearance was obtained from the Malaysia Medical Research and Ethics Committee (MREC) before the commencement of the study. Approval to carry out the research was obtained from Pejabat Kesihatan Daerah Jerantut and KKBJ.

Study population

We recruited patients aged ≥ 18 years old with hypertension who were registered at the hypertension clinic and had a follow-up of at least 6 months. This study excluded those self-reported to have psychiatric disorders including but not limited to major depressive disorder, those who were unable to read Malay or English, were currently pregnant or breastfeeding, those who self-reported as having other chronic diseases, including but not limited to diabetes mellitus, chronic kidney disease, malignancy, stroke, or cardiovascular disease, those self-reported to have physical disabilities, and patients registered as disabled.

Sample size calculation

The sample size was calculated using G*Power software version 3.1.9.2 by using an odds ratio of 0.56 ('completed higher education') and a Cohen's effect size of 0.5,²³ with a power of 80%, significance level α of 0.05 and 95%

confidence interval. The largest estimated sample size was 388. The required sample size became 485 after being inflated with an estimated 20% non-response rate.

Sampling method

All hypertensive patients who attended the hypertension clinic during the data collection period were sampled using a systematic random sampling method. The calculated sampling fraction was 3. The first individual was selected using an automated number generator software (calculator.net); the subsequent participants were selected at a fixed interval of 3.

Instruments

This study used a set of self-administered questionnaires in both English and Malay. The questionnaire contained five parts: A, B, C, D, and E. Part A contained questions regarding socio-demographic characteristics. Part B contained the 21-item Depression, Anxiety and Stress Scale (DASS-21). The English version of the DASS-21 had an overall Cronbach's alpha value of 0.88,²⁴ and the validated Malay version of the DASS-21 had Cronbach's alpha values of 0.84, 0.74, and 0.79, for the depression, anxiety, and stress scales, respectively.²⁵ Parts C and D contained questions regarding clinical characteristics. Part E contained information about the patient's

blood pressure, body mass index (BMI), and medication records, which were input by the researchers.

Data collection

The data collection was carried out by the chief investigators assisted by research assistants. They were two staff nurses, two medical assistants, and two medical officers. The training of research assistants was completed before data collection. Staff nurses and medical assistants were responsible for preparing sampling frames, screening for eligibility, obtaining consent from participants, and measurement of blood pressure. The chief investigator and two medical officers were responsible for the questionnaire and interpretation of the DASS-21 score.

Measurement of psychological distress

We used the DASS-21 questionnaire to measure depression, anxiety, and stress. The total scores of each domain was multiplied by 2 to obtain the final scores.²⁴ Psychological distress was categorised and defined by the scores in **Table 1**. Psychological distress was defined by the presence of at least 'mild severity' in either depression, anxiety, or stress. The cut-off score of 'mild symptoms' used to define psychological distress was recommended in a local study.²⁶

Table 1. 21-item Depression, Anxiety and Stress Scale (DASS-21) scoring.

	Depression	Anxiety	Stress
Normal	0–9	0–7	0–14
Mild	10–13	8–9	15–18
Moderate	14–20	10–14	19–25
Severe	21–27	15–19	26–33
Very severe	28+	20+	34+

Variables

In this study, the dependent variable was psychological distress represented by depression, anxiety, or stress, which are presented as categories (**Table 1**). The independent variables were socio-demographic characteristics (age, gender, ethnicity, marital status, employment status, monthly household income, and educational level) and clinical characteristics (smoking status, exercise status, family history of mental illness, worry about complications of hypertension, usage of a beta-blocker, length of follow-up, BMI, and blood pressure control).

Pilot study

This questionnaire was evaluated in a pilot study with 40 respondents for face and content validity before data collection and was found satisfactory. DASS-21 in the pilot study had Cronbach's alpha values of 0.863, 0.747, and 0.824 for depression, anxiety, and stress, respectively. The data obtained from the pilot study were not included in the final study.

Data analysis

The categorical data are reported as frequencies and percentages. The normally distributed continuous data are presented as means with

standard deviation (SD). Non-normally-distributed continuous data are presented as medians and interquartile ranges (IQR). IBM Statistical Package for Social Science (SPSS) version 26.0 software was used for statistical analysis.

The categorical data that contained $\geq 20\%$ cells with an expected count of < 5 were re-categorised into meaningful categories according to their significance from the literature review. Re-categorisation was performed to avoid small, expected numbers in the cells, leading to assumption violation in the chi-square test. These variables were ethnicity, marital status, monthly household income, and BMI.

We used a chi-square test for the categorical data and an independent t-test or Mann-Whitney U test for the continuous data to identify the associations between the depression, anxiety, and stress symptoms (dependent variables) and the socio-demographic and clinical characteristics (independent variables). The chi-square test was used to determine the reference group for the independent variables' categories in multiple logistic regression analysis.

Subsequently, simple logistic regression (SLR) was conducted to identify potential independent determinants with a p-value < 0.25 for the multiple logistic regression (MLR). Then, MLR was conducted. The level of significance was set at $p < 0.05$. The results for MLR are presented as odds ratios (OR) with 95% confidence interval (CI).

The goodness of fit of the model was tested using the Hosmer-Lemeshow test. Residual statistics (studentised residual and standardised residual) and influential statistics (Cook's distance, DFBeta value, and leverage value) were run to identify the fitness of the model and any points that may influence the model. A few extreme residual values were noted from the studentised and standardised

residual values; those extreme residual values were removed before re-running the test. The extreme residual values were found to not influence the results of our model; therefore, these extreme residual values were retained in our final model.

Results

Respondents' characteristics

A total of 391 patients were selected using a systematic randomisation sampling method for participation. Of the 391 patients, 2 declined participation. The final number of participants was 389, with a response rate of 99.5%. The mean age of the respondents was 60.1 years. Over half of the study population were female (55.3%), and over half of the study population (57.6%) had achieved adequate blood pressure control ([Table 2](#)).

Regarding the respondents' psychological status, 28.8% (112/389) were noted to have psychological distress with either depressive symptoms (16.2%, 63/389), anxiety symptoms (21.3%, 83/389), or stress symptoms (13.9%, 54/389).

Factors associated with psychological distress [Table 2](#) shows the association between depressive, anxiety, and stress symptoms and socio-demographic and clinical characteristics in patients with hypertension using a bivariate analysis.

Depressive symptoms were significantly associated with poor blood pressure control ($p < 0.001$) and worry about complications of hypertension ($p < 0.001$). Anxiety symptoms were significantly associated with older age ($p = 0.002$), employment status ($p = 0.002$), poor blood pressure control ($p < 0.001$), worry about complications of hypertension ($p < 0.001$), and higher BMI ($p = 0.007$). Stress symptoms were significantly associated with older age ($p = 0.008$), poor blood pressure control ($p < 0.001$), worry about complications ($p < 0.001$), and higher BMI ($p = 0.005$).

Table 2. Association between psychological distress and socio-demographic and clinical characteristics in patients with hypertension using bivariate analysis (n=389).

Parameters	Total	Depressive symptoms			Anxiety symptoms			Stress symptoms		
		Absence n=326 (83.8%)	Presence n=63 (16.2%)	p-value	Absence n=306 (78.7%)	Presence n=83 (21.3%)	p-value	Absence n=335 (86.1%)	Presence n=54 (13.9%)	p-value
Age (years)[§]	389	60.6 (±11.4)	57.9 (±13.1)	0.092	61.1 (±11.5)	56.7 (±12.0)	0.002	60.8 (±11.3)	56.3 (±13.2)	0.008
Gender										
Male	174	150 (86.2)	24 (13.8)	0.128	140 (80.5)	34 (19.5)	0.437	155 (89.1)	19 (10.9)	0.247
Female	215	176 (81.9)	39 (18.1)		166 (77.2)	49 (22.8)		180 (83.7)	35 (16.3)	
Ethnicity										
Chinese	113	99 (87.6)	14 (12.4)	0.192	93 (82.3)	20 (17.7)	0.262	98 (86.7)	15 (13.3)	0.825
Non-Chinese	276	227 (82.2)	49 (17.8)		213 (77.2)	63 (22.8)		237 (85.9)	39 (14.1)	
Marital status										
Married	304	256 (84.2)	48 (15.8)	0.681	234 (77.0)	70 (23.0)	0.124	261 (85.9)	43 (14.1)	0.777
Other than married	85	70 (82.4)	15 (17.6)		72 (84.7)	13 (15.3)		74 (87.1)	11 (12.9)	
Employment status										
Employed/ Own business	133	109 (82.0)	24 (18.0)	0.540	93 (69.9)	40 (30.1)	0.002	113 (85.0)	20 (15.0)	0.801
Unemployed	74	65 (87.8)	9 (12.2)		56 (75.7)	18 (24.3)		63 (85.1)	11 (14.9)	
Retired/Pensioner	182	152 (83.5)	30 (16.5)		157 (86.3)	25 (13.7)		159 (87.4)	23 (12.6)	
Monthly household income										
≥RM3,000	72	63 (87.5)	9 (12.5)	0.346	53 (73.6)	19 (26.4)	0.246	67 (93.1)	5 (6.9)	0.059
<RM3,000/	317	263 (83.0)	54 (17.0)		253 (79.8)	64 (20.2)		268 (84.5)	49 (15.5)	
Education level										
No formal education Primary school Secondary school College/ University	24 133 192 40	20 (83.3) 111 (83.5) 161 (83.9) 34 (85.0)	4 (16.7) 22 (16.5) 31 (16.1) 6 (15.0)	0.996	18 (75.0) 110 (82.7) 149 (77.6) 29 (72.5)	6 (25.0) 23 (17.3) 43 (22.4) 11 (27.5)	0.471	21 (87.5) 116 (87.2) 161 (83.9) 37 (92.5)	3 (12.5) 17 (12.8) 31 (16.1) 3 (7.5)	0.501
Blood pressure										
Controlled	224	210 (93.8)	14 (6.3)	<0.001	198 (88.4)	26 (11.6)	<0.001	213 (95.1)	11 (4.9)	<0.001
Uncontrolled	165	116 (70.3)	49 (29.7)		108 (65.5)	57 (34.5)		122 (73.9)	43 (26.1)	
Smoking status										
Never smoked	285	237 (83.2)	48 (16.8)	0.539	223 (78.2)	62 (21.8)	0.861	246 (86.3)	39 (13.7)	0.889
Current smoker	50	41 (82.0)	9 (18.0)		39 (78.0)	11 (22.0)		42 (84.0)	8 (16.0)	
Ex-smoker	54	48 (88.9)	6 (11.1)		44 (81.5)	10 (18.5)		47 (87.0)	7 (13.0)	
Exercise status										
No exercise <150 min/week ≥150 min/week	177 144 68	141 (19.7) 127 (88.2) 58 (85.3)	36 (20.3) 17 (11.8) 10 (14.7)	0.111	136 (76.8) 118 (81.9) 52 (76.5)	41 (23.2) 26 (18.1) 16 (23.5)	0.479	148 (83.6) 127 (88.2) 60 (88.2)	29 (16.4) 17 (11.8) 8 (11.8)	0.427
Family history of mental health problems										
Absent	352	297 (84.4)	55 (15.6)	0.346	281 (79.8)	71 (20.2)	0.083	306 (86.9)	46 (13.1)	0.152
Present	37	29 (78.4)	8 (21.6)		25 (67.6)	12 (32.4)		29 (78.4)	8 (21.6)	
Worry about complications of hypertension										
Absent	139	130 (93.5)	9 (6.5)	<0.001	133 (95.7)	6 (4.3)	<0.001	133 (95.7)	6 (4.3)	<0.001
Present	250	196 (78.4)	54 (21.6)		173 (69.2)	77 (30.8)		202 (80.8)	48 (19.2)	
Usage of beta-blocker										
Did not use	298	248 (83.2)	50 (16.8)	0.572	238 (79.9)	60 (20.1)	0.295	258 (86.6)	40 (13.4)	0.636
Used	91	78 (85.7)	13 (14.3)		68 (74.7)	23 (25.3)		77 (84.6)	14 (15.4)	
Length of follow-up (years)[†] BMI										
Normal	67	57 (85.1)	10 (14.9)	0.756	61 (91.0)	6 (9.0)	0.007	65 (97.0)	2 (3.0)	0.005
Other than normal	322	269 (83.5)	53 (16.5)		245 (76.1)	77 (23.9)		270 (83.9)	52 (16.1)	

Depressive symptoms are defined as DASS-21 depression score >9; Anxiety symptoms are defined as DASS-21 anxiety score >7; Stress symptoms are defined as DASS-21 stress score >14; Controlled blood pressure (BP) is defined as diastolic BP <90 mmHg and systolic BP <140 mmHg; Uncontrolled BP is defined as diastolic BP ≥90 mmHg or systolic BP ≥140 mmHg; Normal BMI is defined as BMI 18.5–22.9 kg/m²; Abnormal BMI is defined as BMI <18.5 kg/m² or BMI ≥23.0 kg/m²

[§] : analysed with independent t-test

[†] : analysed with Mann–Whitney U test

* significant at p<0.05

Determinants of psychological distress based on multivariate logistic regression

The final model identified three determinants of depressive symptoms among patients with hypertension (**Table 3**): 'uncontrolled blood pressure' (OR: 6.4; 95% CI: 3.32–12.28, $p<0.001$), 'presence of worry about complications of hypertension' (OR: 4.5; 95% CI: 2.08–9.94, $p<0.001$), and 'no exercise' (OR: 2.4; 95% CI: 1.23–4.85, $p=0.001$).

The final model for anxiety symptoms identified four determinants (**Table 3**), with 'being worried about complications of hypertension' as the strongest determinant (OR: 10.8; 95% CI: 4.15–28.17, $p<0.001$),

followed by 'did not receive a formal education' (OR: 4.9; 95% CI: 1.42–17.36, $p=0.012$), 'had uncontrolled blood pressure' (OR: 4.9; 95% CI: 2.74–8.72, $p<0.001$), and 'being employed or having own business' (OR: 2.7; 95% CI: 1.38–5.35, $p=0.004$).

The model for stress symptoms identified three determinants: 'uncontrolled blood pressure' (OR: 6.3; 95% CI: 3.05–12.97, $p<0.001$), 'presence of worry about complications of hypertension' (OR: 5.3; 95% CI: 2.14–13.22, $p<0.001$), and 'monthly household income of less than RM3,000' (OR: 3.7; 95% CI: 1.37–10.29, $p=0.010$).

Table 3. Determinants of depressive, anxiety, and stress symptoms in patients with hypertension using multiple logistic regression (n=389).

Parameters	Depressive symptoms		Anxiety symptoms		Stress symptoms	
	Adjusted odds ratio (95% CI)	p-value	Adjusted odds ratio (95% CI)	p-value	Adjusted odds ratio (95% CI)	p-value
Age (years)	0.988 (0.630–3.993)	0.371	1.011 (0.977–1.046)	0.526	0.981 (0.955–1.009)	0.179
Gender						
Male	1	-				
Female	1.414 (0.771–2.595)	0.263				
Ethnicity						
Chinese	1	-				
Non-Chinese	1.148 (0.526–2.505)	0.729				
Marital status						
Married			1	-		
Other than married			1.878 (0.862–4.094)	0.113		
Employment status						
Employed/Own business			2.719 (1.382–5.351)	0.004		
Unemployed			2.017 (0.919–4.428)	0.080		
Retired/Pensioner			1	-		
Education level						
No formal education			4.970 (1.423–17.362)	0.012		
Primary school			1	-		
Secondary school			0.989 (0.508–1.926)	0.975		
College/University			1.210 (0.446–3.281)	0.708		
Household income						
≥RM3,000/month					1	-
<RM3,000/month					3.759 (1.373–10.295)	0.010
Blood pressure						
Controlled	1	-	1	-	1	-
Uncontrolled	6.384 (3.320–12.276)	<0.001	4.895 (2.745–8.828)	<0.001	6.301 (3.059–12.979)	<0.001
Exercise status						
<150 min/week	1	-				
No exercise	2.451 (1.236–4.859)	0.01				
≥150 min/week	1.393 (0.565–3.432)	0.471				
Family history of mental health problems						
Absent			1	-		
Present			2.210 (0.927–5.268)	0.074		
Worry about complications of hypertension						
Absent	1	-	1	-	1	-
Present	4.547 (2.080–9.939)	<0.001	10.816 (4.153–28.165)	<0.001	5.314 (2.135–13.227)	<0.001
BMI						
Normal			1	-	1	-
Other than normal			1.678 (0.649–4.341)	0.286	4.302 (0.975–18.976)	0.054

Depressive symptoms are defined as DASS-21 depression score >9; Anxiety symptoms are defined as DASS-21 anxiety score >7; Stress symptoms are defined as DASS-21 stress score >14; Controlled BP is defined as diastolic BP <90 mmHg and systolic BP <140 mmHg; Uncontrolled BP is defined as diastolic BP ≥90 mmHg or systolic BP ≥140 mmHg; Normal BMI is defined as BMI 18.5–22.9 kg/m²; Abnormal BMI is defined as BMI <18.5 kg/m² or BMI ≥ 23.0 kg/m²

* significant at $p<0.05$

Discussion

Prevalence of psychological distress

There was discrepancy between our results and the reported prevalence of depression, anxiety, and stress. Overall, the prevalence of depression, anxiety, and stress found in our study was lower than that reported in the literature.^{9,13,17,21} This discrepancy could be due to different measuring tools, locations, and age groups. Despite the differences, the prevalence of psychological distress among the respondents was high. We found that 28.8% of the respondents had psychological distress represented by depressive, anxiety, and stress symptoms. Some of the respondents had a combination of two or all three symptoms.

We found that 16.2% of the respondents had depressive symptoms. The result was lower than the results of a systematic review by Li et al., where the prevalence of depressive symptoms among patients with hypertension was reported to be 26.8%.¹¹ This discrepancy could be due to the different measuring tools used by the studies. Li et al.'s study mainly adopted papers from China using Zung's Self-Rating Depression Scale, which has higher sensitivity (0.93) but lower specificity (0.69) in detecting depression when compared with the DASS-21 depression subscales (sensitivity 0.84, specificity 0.84).²⁷ As a result, our low prevalence of depression could be due to a lower sensitivity of the screening tool with fewer false-positive cases.

The prevalence of depression, anxiety, and stress in our study was much lower than that reported by other studies in a hospital setting, such as a study by Gebre et al., who reported a depression prevalence of 24.7%. Aberha et al., who reported an anxiety prevalence of 28.5%, and Kretchy et al., who reported a stress prevalence of 35%.^{9,13,16} Across geographical regions with different cultural and political backgrounds, Ashok et al. reported that 41% of their study population in India had depression. The author concluded that the high prevalence of depression could be influenced by socio-cultural factors.⁸ In contrast, Hamrah et al. noted that 58.1% of the study population in Afghanistan had depression, and 42.3% had anxiety, which could have been due to the political situation in the country at the time of the study.^{15,28}

In Malaysia, our study yielded a higher prevalence of depressive and anxiety symptoms

than that reported by Norfazilah et al. (depressive symptoms 4%; anxiety symptoms 13.2%), likely due to differences in the study populations. The study by Norfazilah et al. was conducted in a hospital setting with fewer women (41.2% vs. 55.3%).²¹ Men and women may have different responses towards stressors due to differences physical and hormonal factors and their role in society, where women are more easily affected by stressors than men.¹⁷ We also reported a higher prevalence of anxiety symptoms than Ismail et al. (21.3% vs. 13.3%).²⁰ A possible explanation for this discrepancy is that our study recruited individuals above the age of 18 years, whereas Ismail et al. recruited individuals above 60 years, and most of them were likely not employed. In our study, we noted that individuals who were working were more likely to have anxiety symptoms than those who were not working. The proportion of patients who were working was not reported by Ismail et al.; about one-third of the patients in our study were employed.

Determinants of psychological distress

a) Worry about complications of hypertension

The presence of worry about complications of hypertension was associated with depression, anxiety, and stress. We were not surprised by this finding, as 64.3% of our respondents reported feeling worried about the complications of hypertension. The researchers from the Edvantage 360° study concluded that the possibility of future cardiovascular complications, namely stroke, caused patients with hypertension to experience frustration and anxiety.⁶ This finding is significant as it is common for patients to express concern about complications of hypertension rather than telling healthcare providers that they are depressed, anxious, or stressed. When hypertensive patients express their worry, it cues healthcare providers to screen for depression, anxiety, and stress.

b) Uncontrolled blood pressure

Our study showed that respondents with uncontrolled blood pressure were 6 times more likely to have depressive symptoms than those with controlled blood pressure. Similar observations were reported by Gebre et al. (OR 7.57), Almas et al. (OR 1.94), and Ashok et al. (OR 4.33).^{8,9,29} The association between depression and uncontrolled blood pressure could be due to poorer disease management behaviour among patients with depression. Zakaria et al. noted that hypertensive

patients with depressive symptoms had lower compliance towards medication.³⁰ Doubuva et al. noted that this group of patients tended to have poorer adherence to lifestyle advice, such as low regulation of salt intake, that could potentially lower blood pressure.⁷

Patients with uncontrolled blood pressure were 6 times more likely to have stress symptoms than those with controlled blood pressure. The association between uncontrolled blood pressure and stress symptoms could be due to the effects of stress hormones that increase heart rate and blood pressure.³¹

Patients with uncontrolled blood pressure were 5 times more likely to have anxiety symptoms than those with controlled blood pressure. This could be due to the patients' awareness of uncontrolled blood pressure. Hypertensive awareness has been shown to lead to psychological distress.¹⁹

Liu et al. concluded that the relationship between psychological stress and blood pressure was bidirectional.⁴ Awareness of uncontrolled blood pressure could be a stressor that leads to depression, anxiety, and stress symptoms. Moreover, depression, anxiety, and stress worsen the existing blood pressure through poor lifestyle changes and non-adherence to medications.⁷ The vicious cycle of psychological distress and uncontrolled blood pressure is unresolved without early identification and intervention.

Strengths of this study

Our study, carried out in a primary care clinic, achieved an exceptionally high response rate. We studied three psychological symptoms (depression, anxiety, and stress) in contrast to the first two symptoms in other studies. In addition, our study excluded comorbidities, allowing the effects of hypertension alone on psychological distress to be examined.

Limitations of this study

Our study was carried out in a single government primary health care clinic and therefore the results cannot be extrapolated to another population, especially patients who receive treatment at a private centre as

they are likely to have a higher socioeconomic background. In addition, our study was potentially subjected to response bias, as mental distress could be underreported due to shame. Our study was inevitably conducted during COVID-19 pandemic, where daily routines had changed due to the Movement Control Orders (MCO) with strict Standard Operating Procedures, including wearing a mask in public places, no social gatherings, and no outdoor activities, which could contribute to the high prevalence of psychological distress among the general Malaysian population. Perveen et al. reported that 42.5% of the general population had depressive symptoms, 67.7% had anxiety symptoms, and 80.7% had stress symptoms.³² However, the impact of the pandemic on the psychological stress of the study population could have been lessened, as the study was completed in September 2020, in the period of post-MCO, and the case burden of COVID-19 was improving. Nevertheless, the impact of COVID-19 cannot be ignored, and the results must be interpreted with caution.

In summary, the prevalence of psychological distress among hypertensive patients in our study is significant.; One in four patients had depressive, anxiety, or stress symptoms. Alarming, all these symptoms were significantly associated with uncontrolled blood pressure. Worrying about hypertensive complications appeared to be significantly associated with the three symptoms. Screening for psychological distress should be performed in high-risk individuals, especially those with uncontrolled hypertension or those concerned about hypertension complications. Early detection of psychological distress is urgently needed for further intervention.

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Conflicts of interest

There are no conflicts of interest to declare in this study.

How does this paper make a difference in general practice ?

- Our results suggest that the prevalence of psychological distress is high among Malaysian hypertensive patients.
- We recommend that primary care doctors should screen for psychological distress in patients with uncontrolled blood pressure or patients who worry about hypertensive complications, in addition to other identified risk factors, with appropriate screening tools.

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ORIGINAL ARTICLE

Patients' satisfaction with healthcare services providers and its determinants in the urban family physician program in Iran: A cross-sectional study

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Abstract

Introduction: The quality of healthcare services can be determined by patient satisfaction as it affects the performance, sustainability, and durability of health services. This study aims to determine patients' satisfaction with healthcare service providers and its determinants in the urban family physician program in Fars and Mazandaran provinces, Iran.

Methods: A cross-sectional study was conducted on the populations covered by the urban family physician program in Fars and Mazandaran provinces in 2016. In total, 864 households were selected in each province using random cluster sampling. Socio-demographic variables and underlying factors were gathered. Patient satisfaction levels were evaluated using a validated questionnaire.

Results: Of the 1,480 participants with a mean age of 46.9 ± 14.2 years, 53.3% lived in Fars province and 74.2% were female. Furthermore, 67.9% of the patients were satisfied with their healthcare service providers. A higher satisfaction level was observed among the patients who resided in Fars province, lived in cities with <100,000 residents, walked <10 minutes to the family physician's office, had a family physician they previously knew, accepted the family physician, had a positive attitude towards the importance of having a family physician and a referral system, and had adequate knowledge of the family physician program.

Conclusion: The results indicated that two-thirds of the patients were satisfied with healthcare service providers. Several socio-demographic variables were associated with the patients' satisfaction levels. Improving the family physician program by providing adequate medical equipment and monitoring physicians' performance could increase patient satisfaction and improve the sustainability of the program.

Introduction

Patient satisfaction plays an important role in the performance, sustainability, and durability of healthcare services, and determines the quality of healthcare services.¹ Recent studies have emphasised that patient satisfaction is multifactorial. Lower patient satisfaction with healthcare providers leads to lower adherence to physician's advice and treatment protocols and a lower rate of recovery from diseases. If they are dissatisfied, patients may change their physicians and healthcare centres.²

In Iran, health houses and health posts are the first levels of the healthcare system in rural and urban areas, respectively. Several health houses are under the supervision of a rural health centre, which is managed by a

general practitioner. Urban health centres also supervise health posts. General practitioners refer patients to specialists at the second level of the healthcare system.³ The family physician program was implemented in rural and urban areas with populations under 20,000 to augment the referral system.⁴ In 2012, the family physician program was subsequently implemented in urban areas with populations over 20,000 only in Fars and Mazandaran provinces.⁵

Studies conducted in Iran have reported different levels of satisfaction among healthcare recipients. A study in Sabzevar indicated that 55.7% of patients were satisfied with their family physicians.⁶ Another study conducted on 11,200 patients covered by rural insurance

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in 32 provinces in Iran showed that the mean scores of satisfaction with family physicians and midwives were 70.1 (out of 85) and 33.5 (out of 40), respectively. They also reported that the overall score of satisfaction with healthcare services was 12.6 (out of 15).⁷ The higher level of satisfaction among the population covered by insurance was accompanied by an increased willingness to receive therapeutic and preventive services, lower motivation to access the second level of healthcare services without being referred by a family physician, and unwillingness to change one's family physician.⁸ Therefore, assessment of patient satisfaction can reflect the quality of services and the success of the family physician program. The present study aimed to determine patients' satisfaction with healthcare service providers and its determinants in the urban family physician program in Fars and Mazandaran provinces of Iran.

Methods

A cross-sectional study was conducted in Fars and Mazandaran provinces of Iran, where the urban family physician program was implemented. The study protocol was approved by the Ethics Committee of Babol University of Medical Sciences, Babol, Iran (IR.MUBABOL.REC.1397.032). The participants were provided with information about the study objectives and their verbal consent was obtained.

Using the sample size formula and considering $p=0.9$, a 95% confidence interval (CI), and an accuracy of 0.028, the sample size was estimated to be 864 households for each province. Sampling was conducted in the cities with populations >20,000 in Fars and Mazandaran provinces. Eligible households were recruited using the cluster random sampling method and through door-to-door visits. One person was selected from each household for interview. The inclusion criteria were age >15 years, being covered by the urban family physician program, and having received a visit by the family physician at least once during the past 3 months. Mentally disabled people and those who were unwilling to cooperate were excluded.

Data collection instruments

A door-to-door interview was conducted to gather the data using a data-gathering sheet and a questionnaire. Socio-demographic variables and underlying factors associated with the patients' satisfaction with healthcare service providers were collected using the

data-gathering sheet. This sheet included information about the residential area, sex, age, marital status, education level, occupation, supplemental health insurance, family size, distance to the family physician's office on foot or by motor vehicle, number of visits, history of changing family physicians, choosing a previously known family physician, the family physician's acceptance by the patient (regarding work experience, reputation, etc.), having the family physician's phone number, patient's attitude towards the importance of having a family physician, patient's attitude towards the importance of a referral system (referral to level 2 of the referral system at the discretion of the family physician), and patient's knowledge about the family physician program. Based on a Likert scale ('strongly disagree', 'disagree', 'no opinion', 'agree', and 'strongly agree'), the patients' attitudes were measured and categorised as 'positive' ('very agree' and 'agree') or 'negative' ('very disagree' and 'disagree'). The patients' knowledge about the family physician program was categorised into three levels: 'low' (<40%), 'moderate' (40–60%), and 'high' (≥60%). Accordingly, the 'low' and 'moderate' knowledge levels were considered inadequate, while the 'high' level was regarded as adequate.

Patients' satisfaction with the healthcare service providers was assessed using a validated questionnaire completed through an interview. The questionnaire consisted of 11 questions scored from 0 to 5 based on a Likert scale ('very low', 'low', 'moderate', 'high', and 'very high') (Table 1). The patients were categorised as either 'satisfied' (score ≥3.5) or 'dissatisfied' (score <3.5). The total score of the patients' satisfaction with the services provided by healthcare providers was estimated as the mean of the scores of the 11 questions. The validity of the questionnaire was verified by a panel of experts from Iranian health insurance organisations, urban family physicians, and health experts; its reliability was confirmed with a Cronbach's alpha coefficient of 0.91.

Statistical analysis

The data were analysed using SPSS 22.0 software for Windows (IBM Corp., Armonk, NY, USA). Numerical and categorical variables are expressed as mean ± SD and number (%), respectively. A chi-square test was used to determine the differences between the satisfied and dissatisfied groups regarding the demographic variables and the underlying factors associated with patient satisfaction. Backward stepwise logistic regression analysis

was used to assess the relationship between the underlying factors and patient satisfaction. The significance level was set at $p < 0.05$.

Results

This study was conducted on 1,480 patients with a mean age of 46.9 ± 14.2 years (Figure 1). Among the patients, 67.9% were satisfied and 32.1% were dissatisfied with the provided healthcare services. The mean score of satisfaction in the overall population was 3.74 ± 0.7 . The patients' levels of satisfaction with healthcare providers in the urban family physician program in Fars and Mazandaran provinces are presented in Table 1. The patients were more satisfied with their doctors' behaviour and communication skills and less satisfied with the medical equipment in healthcare centres and offices.

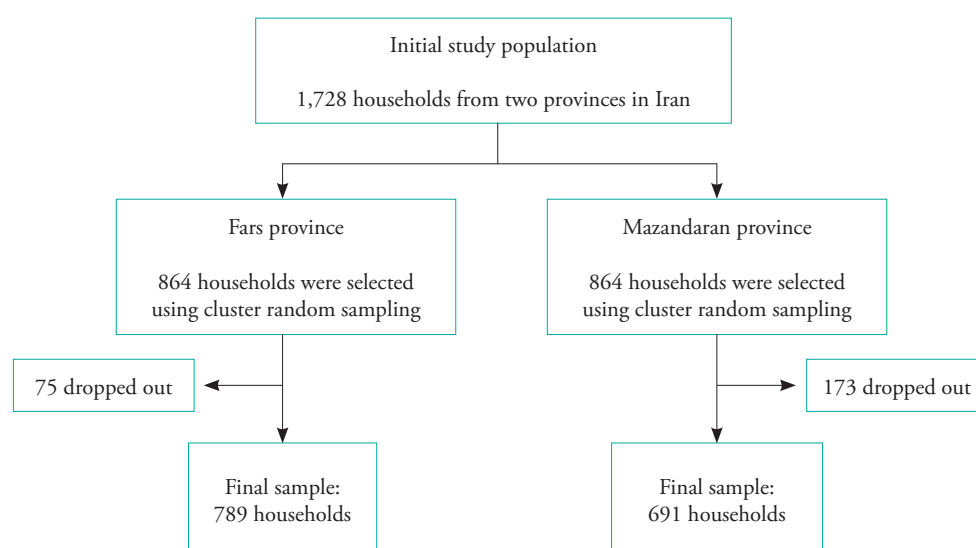


Figure 1. Flowchart of the study participants.

Table 1. The levels of patients' satisfaction with health service providers from the urban family physician program in Fars and Mazandaran provinces.

	Total score	Satisfaction level		
		Very low and low	Moderate	High and very high
Satisfaction with				
Family physicians' behaviours and communication skills	4.02 ± 0.90	71 (4.9)	294 (19.9)	1114 (75.3)
Healthcare workers' behaviours and communication skills*	3.95 ± 0.86	31 (3.7)	198 (23.6)	610 (72.7)
Cleanliness and tidiness of the healthcare centre/office	3.80 ± 0.79 [†]	62 (4.2) [‡]	401 (27.1)	1015 (68.7)
Timely attendance of the family physician at the healthcare centre/office	3.80 ± 0.88	101 (6.8)	336 (22.7)	1042 (70.5)
Health promotion education and recommendation by healthcare workers*	3.79 ± 0.95	53 (6.4)	238 (29.0)	531 (64.6)
Job discipline of healthcare workers and duration of their attendance at the healthcare centre/office*	3.77 ± 0.81	43 (4.7)	252 (27.3)	627 (68.0)
The knowledge and skill of the family physician in disease diagnosis and treatment	3.73 ± 0.93	106 (7.2)	436 (29.7)	925 (63.1)
Waiting time to receive healthcare services at the healthcare centre/office	3.68 ± 0.87	123 (8.3)	385 (26.0)	970 (65.6)
The effectiveness of the medications or treatment outcomes	3.61 ± 0.92	134 (9.2)	454 (31.1)	872 (59.7)
Health promotion education and recommendation by family physicians	3.58 ± 1.06	198 (13.4)	398 (27.0)	878 (59.6)
Medical equipment in the healthcare centre/office	3.50 ± 0.84	131 (9.0)	555 (38.0)	774 (53.0)

[†]Data are presented as mean $\pm$ SD. [‡]Data are presented as N (%). Satisfaction was scored based on a Likert scale ranging from 0 to 5. *Only households with pregnant women and/or children under 6 years old used these services and answered these questions. The satisfaction level was considered 3.5 (≥ 3.5 = satisfied; < 3.5 = dissatisfied).

The relationship between patient satisfaction and socio-demographic and underlying factors is shown in **Table 2**. The determinants of patient satisfaction identified via logistic regression analysis are listed in **Table 3**. According to the findings, satisfaction with healthcare service providers was higher among the patients who resided in cities with a population <100,000 compared with patients living in cities with a population >100,000 (OR=1.38, 95% CI: 0.95–2.00). Satisfaction was higher among patients who resided in Fars province compared with those living in Mazandaran province (OR=1.95, 95% CI: 1.39–2.74), and among the patients who walked less than 10 minutes to the family physician's office (OR=1.50, 95% CI: 1.08–2.07). Patient satisfaction was also associated with choosing a previously known family physician (OR=1.73, 95% CI: 1.24–2.41), complete acceptance of the family physician (OR=2.93, 95% CI: 2.09–4.11), positive attitude towards the importance of having a family physician (OR=2.49, 95% CI: 1.65–3.77), positive attitude towards having a referral system (OR=1.60, 95% CI: 1.09–2.36), and having adequate knowledge about the family physician program (OR=1.51, 95% CI: 1.06–2.15).

Table 2. Distribution of the socio-demographic variables and underlying factors according to satisfaction status.

		Satisfied patients	Dissatisfied patients	p-value
Province of residence	Fars	571 (72.4)	218 (26.6)	<0.001
	Mazandaran	434 (62.8)	257 (37.2)	
Residence in a city with a university of medical sciences	Yes	550 (67.9)	260 (32.1)	1.00
	No	455 (67.9)	215 (32.1)	
Population of the city of residence	≤100,000	313 (72.0)	122 (28.0)	0.03
	>100,000	692 (66.2)	353 (33.8)	
Sex	Male	244 (71.8)	96 (28.2)	0.45
	Female	678 (69.5)	298 (30.5)	
Age (years)	15–50	526 (68.9)	237 (31.1)	0.27
	>50	385 (71.8)	151 (28.2)	
Marital status	Single	124 (69.7)	54 (30.3)	0.86
	Married	791 (70.3)	334 (29.7)	
Education level	Illiterate to high school	480 (72.1)	186 (27.9)	0.08
	Diploma or higher	424 (67.5)	204 (32.5)	
Occupation	Employed	172 (68.0)	81 (32.0)	0.44
	Homemaker, retired, or unemployed	739 (70.4)	310 (29.6)	
Having supplemental health insurance	Yes	397 (69.0)	178 (31.0)	0.46
	No	608 (67.2)	297 (32.8)	
Family size	1–3	587 (66.8)	292 (33.2)	0.26
	4–7	418 (69.7)	182 (30.3)	
Distance to family physician's office on foot	≤10 min	513 (70.6)	214 (29.4)	0.04
	>10 min	422 (65.5)	222 (34.5)	
Distance to family physician's office by motor vehicle	≤5 min	574 (72.5)	218 (27.5)	0.01
	>5 min	206 (64.6)	113 (35.4)	
Number of visits	Less than twice a year	261 (67.4)	126 (32.6)	0.16
	More than twice a year	635 (71.5)	253 (28.5)	
Prior history of changing the family physician	Yes	290 (64.9)	157 (35.1)	0.10
	No	715 (69.3)	317 (30.7)	
Choosing a previously known family physician	Yes	676 (75.4)	220 (24.6)	<0.001
	No	328 (56.4)	254 (43.6)	
Family physician's acceptance by the patients (regarding work experience, reputation, etc.)	Completely acceptable	753 (78.6)	205 (21.4)	<0.001
	Relatively acceptable	250 (48.2)	269 (51.8)	

		Satisfied patients	Dissatisfied patients	p-value
Having the family physician's phone number	Yes	338 (74.3)	117 (25.7)	<0.001
	No	660 (65.2)	352 (34.8)	
Patient's attitude towards the importance of having a family physician	Positive	771 (74.5)	264 (25.5)	<0.001
	Negative	162 (47.5)	179 (52.5)	
Patient's attitude towards the importance of a referral system (referring to level 2 of the referral system at the discretion of the family physician)	Positive	604 (75.1)	200 (24.9)	<0.001
	Negative	290 (54.8)	239 (45.2)	
Patient's knowledge of the family physician program	Adequate ($\geq 60\%$)	346 (73.5)	125 (26.5)	0.002
	Inadequate ($< 60\%$)	659 (65.3)	350 (34.7)	

Data are presented as N (%).

Table 3. Backward stepwise logistic regression analysis of the relationship between patient satisfaction and socio-demographic and underlying factors of the patients covered by the urban family physician program in Fars and Mazandaran provinces.

	Satisfaction status (satisfied/dissatisfied)	
	OR	95% Confidence Interval
Province of residence Fars Mazandaran (Ref)	1.95	1.39–2.74
Population of the city of residence <100,000 $\geq 100,000$ (Ref)	1.38	0.95–2.00
Distance to the family physician's office on foot ≤ 10 min >10 min (Ref)	1.50	1.08–2.07
Choosing a previously known family physician Yes No (Ref)	1.73	1.24–2.41
Family physician's acceptance by the patients (regarding work experience, reputation, etc.) Completely acceptable Relatively acceptable (Ref)	2.93	2.09–4.11
Patient's attitude towards the importance of having a family physician Positive Negative (Ref)	2.49	1.65–3.77
Patient's attitude towards the importance of a referral system (referring to level 2 of the referral system at the discretion of the family physician) Positive Negative (Ref)	1.60	1.09–2.36
Patient's knowledge of the family physician program Adequate Inadequate (Ref)	1.51	1.06–2.15

Ref, Reference category

Discussion

The findings revealed that two-thirds of the patients were satisfied with their healthcare service providers. The patients were most satisfied with the doctors' behaviour and communication skills, and least satisfied with the medical equipment in healthcare centres and offices. Patient satisfaction was affected by factors such as residence in Fars province, residence in less populated cities, and walking less than 10 minutes to the family physician's office. In addition, the determinants of patient satisfaction included choosing a previously known family physician, acceptance of the family physician, positive attitude towards the importance of having a family

physician and a referral system, and having adequate knowledge of the family physician program. Previous studies consistently revealed a high level of satisfaction in this area. For example, Ashrafi Amiri et al. conducted a study on 955 patients covered by rural insurance and reported that the mean scores of satisfaction with health houses and health centres were 4.5 ± 0.5 and 4.0 ± 0.7 (out of 5), respectively.⁹ Similarly, Ebrahimipour et al. reported that 80% of patients were satisfied with the services provided by the rural family physician program.¹⁰ In another study, the satisfaction with healthcare services provided by a family physician program was at a desirable or relatively desirable level.¹¹ The higher level of satisfaction in rural areas might be attributed to the economic, social, and cultural factors of healthcare service recipients.^{12,13} High-quality services might also lead to higher satisfaction levels; the World Health Organization (WHO) reported that 85.7% of the patients in Canada were satisfied with their healthcare services.¹⁴

The results indicated that choosing previously known family physicians, accepting them, having a positive attitude towards the importance of having a family physician, referral to level two of the referral system at the discretion of the family physician, and having adequate knowledge about the family physician program affected patient satisfaction with healthcare services. It has also been hypothesised that satisfaction with healthcare providers could enhance the utilisation of healthcare services due to the fulfilment of patients' expectations.^{15,16} These findings represent the necessity of culturalisation prior to the implementation of a family physician program.

The results revealed a marginally significant inverse association between the population of the residential area and patient satisfaction. The higher satisfaction levels observed in smaller populations, such as individuals living in rural areas, might be associated with economic, social, and cultural factors influencing the service recipients. In the present study, the patients were most satisfied with the behaviours and communication skills of the family physicians and healthcare workers. These results were in accordance with those of another study conducted in Iran.¹⁷ Generally, patient satisfaction is associated with healthcare workers'

behaviour, appropriate diagnosis of the disease by physicians, and being provided with information about health issues. Polite and proper behaviour not only satisfies patients at each stage of treatment and follow-up, but also encourages them to recommend other patients, relatives, and acquaintances to use such healthcare services.^{18,19} The patients in this study were least satisfied with the equipment at the healthcare centres and offices, which was similar to the results of another study carried out by Taheri et al.¹⁷ Regarding the importance of developing a referral system from the first level, Palmer et al. stated that satisfied patients would not bypass the system.²⁰ Therefore, a healthcare centre should have sufficient personnel and should be well-equipped.

One of the limitations of the present study was the unequal cooperation on the part of males and females. Moreover, because this study was conducted in Fars and Mazandaran provinces, the results cannot be generalised to the whole country. Furthermore, a cause-and-effect relationships could not be determined due to the cross-sectional nature of the research.

In conclusion, two-thirds of the patients were satisfied with healthcare service providers. The lowest satisfaction was with the equipment in healthcare centres, while the patients were most satisfied with the family physicians' behaviour and communication skills. Culturalisation within the community towards the importance of a referral system in the family physician program, providing adequate medical equipment in all healthcare centres, providing the patients with the opportunity to choose their family physician, and monitoring and evaluating the provided healthcare services periodically in larger cities can enhance the quality of the services and patient satisfaction. Furthermore, conducting training courses or workshops may augment the scientific skills of family physicians. Finally, utilisation of the appropriate guidelines by family physicians to diagnose and treat diseases can be effective in increasing the quality and effectiveness of healthcare services.

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Conflicts of interest

The authors have no conflict of interests to declare.

How does this paper make a difference in general practice ?

- Two-thirds of the patients were satisfied with healthcare service providers.
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CASE REPORT

Case report of chronic cough in primary care: a diagnostic challenge and lessons to learn

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Abstract

Cough is one of the most common complaints seen at the outpatient primary health clinic. While the most common aetiologies of chronic cough are asthma, chronic obstructive pulmonary disease, postnasal drip, gastroesophageal reflux disease, drug-induced, and tuberculosis, we often overlook that chronic cough, especially in a young female, can be the initial presenting complaint of an autoimmune disease. In this case report, we present a case of 35-year-old woman with no known prior medical illness who presented with chronic cough for 1 year with no other symptoms initially; but later in the disease course, the patient complained of multiple, symmetrical small joint pain, which led us to the diagnosis of seronegative rheumatoid arthritis.

Introduction

Rheumatoid arthritis (RA) is a systemic, inflammatory disease primarily affecting synovial joints with possible involvement of other organs; and the lungs are a common site of extra-articular disease.¹ Extra-articular involvement occurs in about 40% of patients with RA and includes vasculitis, skin and visceral nodules, Sjögren's syndrome, pulmonary fibrosis, and anaemia of chronic disease.² Successful management of systemic manifestations of RA is dependent upon control of the underlying joint disease and this includes the use of a glucocorticoids, immunosuppressive agents, and biologic therapies.²

According to the 2010 American College of Rheumatology (ACR)/European League Against Rheumatism (EULAR) classification criteria for RA, patients who score $\geq 6/10$ are diagnosed as definite RA³; those who score $<6/10$ are not classified as having RA and should be reassessed in the future.⁴

Rheumatoid factor (RF) and anti-cyclic citrullinated peptide (anti-CCP) are the antibodies that define a patient with seropositive RA. However, 15–25% of RA can be seronegative, meaning that these patients lack RF and anti-CCP antibodies.⁵

Clinical features suggestive of RA (i.e., elevated inflammatory markers and a significant and sustained response to a trial of prednisolone) may indicate the diagnosis of RA.⁵

The 2010 diagnostic criteria emphasise early identification of patients with RA and early treatment to improve outcomes. However, the diagnosis of RA becomes more difficult in patients with an uncommon presentation in early stages of the disease. It is interesting to note that the patient in this case report initially presented with a lung complication of RA instead of the typical symmetrical polyarthritis.

Case presentation

A 35-year-old housewife presented initially to the primary health care clinic with a chief complaint of dry cough for the past 3 weeks. She had no known medical illness and was a non-smoker. There was no frequent nasal discharge, congestion, itchiness, or sneezing to suggest allergic rhinitis, no episodic wheezing or dyspnoea to suggest bronchial asthma, no heartburn to suggest gastro-oesophageal reflux disease (GERD), and no weight loss or night sweats to suggest pulmonary tuberculosis (PTB). Fine crepitations were noted over the right lower zone upon auscultation, and sputum acid-fast bacilli (AFB) and a chest x-ray (CXR) were ordered to rule out PTB, as it is the most common cause of prolonged cough. She was given oral amoxicillin/clavulanic 625 mg twice daily for 1 week to cover for community-acquired pneumonia. During subsequent visits, the patient's cough persisted but PTB workup was negative; a chest x-ray from April 2019 showed reticular opacities over the right lower zone and no

air bronchogram. The patient was prescribed a 3-day course of oral azithromycin 500 mg once daily to cover for atypical pneumonia.

After 5 months, the patient presented again to the primary health clinic with persistent cough. The cough was dry, not aggravated or triggered by environmental factors like cold or dust and was not relieved with antitussive medication. A revisit of the history revealed that the patient had a history of working in an electronics and plastics factory for 1 year (2006–2007). The patient also had a family history of bronchial asthma and was a passive smoker. Given the history, the possibility of obstructive airway disease as the cause of chronic cough was considered, and patient was given a trial of bronchodilator (2 puffs MDI salbutamol, as needed). However, no baseline spirometry or peak expiratory flow rate (PEFR) was performed before or during the bronchodilator use. On a subsequent visit 1 month later, the patient continued to complain of a dry cough despite daily use of the bronchodilator.

Another PTB workup was completed: sputum AFB was negative, but the Mantoux test showed 10 mm induration. Repeated chest x-ray showed progression of the interstitial opacity involving the bilateral lower zones. The patient had a history of contact with a PTB patient 3 years prior. A diagnosis of latent PTB was made for this patient based on a persistent cough and positive Mantoux test with a history of PTB contact. She was treated for latent PTB and completed a 6-month course of daily oral isoniazid 300 mg and daily oral pyridoxine 10 mg.

The patient continued to complain of unresolved cough 8 months after the onset of symptoms; the cough was now associated with generalised body ache for 1 month. No significant findings were noted upon examination. Chest x-ray revealed fibrotic changes in the lungs and the case was referred to a chest physician for an opinion and a spirometry test and high-resolution computed tomography (HRCT) scan were arranged. While waiting the appointment, the patient received symptomatic treatment for the cough and body ache.

The patient presented 4 months later with persistent cough, shortness of breath, and pain over multiple bilateral small joints

in her hands, wrists, and right ankle. The small joint pain was associated with early morning stiffness bilaterally over the hands and wrists that lasted for >30 minutes each day. In addition, she had experienced significant weight loss of approximately 10 kg over 1 year. X-rays of both hands showed periarticular osteopenia. ECG showed no significant pathology. The lung function test showed restrictive lung disease: FVC 68% and FEV1/FVC 91%. The HRCT scan showed nonspecific interstitial pneumonia (NSIP). Based on these findings, she was screened for connective tissue disease. The results were as follows: RF and anti-CCP were both negative, ANA was positive (1:640), dsDNA was negative, C3 and C4 levels were normal, CRP was 37.8 mg/L, ESR was 51mm/hour, and haemoglobin (Hb) was 13.8 g/dL. All other baseline investigations were normal.

The case was referred to a rheumatologist and was treated as seronegative RA. The patient was initially treated with prednisolone, methotrexate (MTX), sulfasalazine, and interarticular triamcinolone in the wrists bilaterally and the right ankle. The sulfasalazine was stopped after 10 months of treatment as the patient continued to complain of joint pain after optimising the medication, which was later changed to cyclosporin. During subsequent follow-up, the patient continued to complain of chronic cough but reported improvement compared with the cough before treatment, and the joint pain had improved after the cyclosporin was initiated. The patient is currently being followed up by primary health care and the rheumatology clinic.



Figure 1. Chest x-ray (CXR) from April 2, 2019.

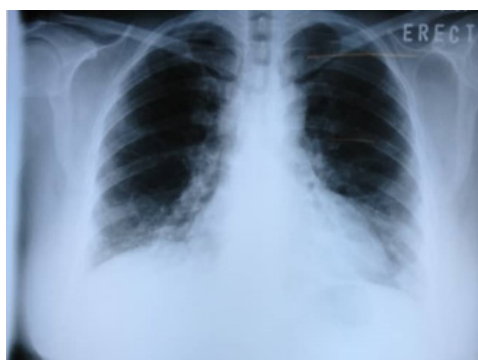


Figure 2. CXR from November 18, 2019.

Discussion

This case has taught us several lessons that we think may be beneficial to share with other primary health care doctors. It also highlights a few lessons in patient management that led to a 1-year delay in diagnosing a young female with chronic cough.

The first lesson is that this patient was initially treated for bronchial asthma and was given a bronchodilator for 6 months. Asthma is a clinical diagnosis; based on the Global Initiative of Asthma (GINA) 2021, a symptom pattern suggestive of asthma and airflow limitation on initial spirometry that completely reverses to normal following bronchodilator administration confirms the diagnosis of asthma.⁶ An isolated cough with no other respiratory symptoms or chronic production of sputum decreases the likelihood that the respiratory symptoms are due to asthma.⁶ As in this case, family history alone is not enough to diagnose asthma without the presence of clinical signs and symptoms. Therefore, it is important to refer a case with chronic cough for spirometry evaluation if there is any doubt regarding the diagnosis. The use of bronchodilator is justified in a case that is strongly suspected to be asthma where spirometry is not accessible to review the reversibility of the airway narrowing with a bronchodilator. However, in this case, the use of a bronchodilator to treat the cough was inappropriate, as the patient did not have the characteristic symptoms of bronchial asthma. This practice should be avoided in the future as it unnecessarily exposes the patient to side effects of bronchodilator use. An early lung function test should have been arranged to assess pattern of airflow limitation before initiating any treatment.

The second lesson is that the patient was also treated for latent pulmonary tuberculosis (LTBI). LTBI is defined as infection with *Mycobacterium tuberculosis* complex in which the bacteria may be alive but in a state of dormancy and not

causing any active disease or symptoms.⁷ LTBI is diagnosed based on the following criteria: 1) no symptoms to suggest active disease, 2) normal CXR/static CXR findings, 3) smear/culture negativity for *M. tuberculosis* from sputum or bronchoalveolar lavage, and 4) positive TST (i.e., Mantoux test).⁷ In Malaysia, a TST ≥ 10 mm is considered positive for LTBI for most individuals; however, LTBI screening should only be performed on high-risk individuals: 1) HIV-infected persons, 2) organ transplant recipients, 3) persons receiving immunosuppressant drugs, 4) recent close contacts with TB (<2 years), 5) recent immigrants (<2 years) from high prevalence countries, 6) intravenous drug users, 7) residents and employees of high-risk congregate settings (e.g., correctional facilities, nursing homes, homeless shelters, hospitals, and other health care facilities), and 8) persons with fibrotic changes on CXR consistent with old TB (patients with calcified lesions should be excluded).⁷ In this case report, the patient had contact with a tuberculous patient 3 years prior. The patient also presented with a chronic cough that did not resolve with antibiotic treatment, had weight loss, and her x-ray showed bilateral lower zone interstitial opacity that warranted the treating doctor to initiate workup for TB. Repeated TB workup was done as the patient's symptoms were not improving with antibiotics, and the repeated CXR showed progressive changes. Sputum AFB was negative. Diagnosis of LTBI in this patient was made based on a history of contact with a PTB patient, persistent cough, and positive Mantoux test; however, it is contradicted by the CXR findings that showed progressive changes, which warranted further expert referral to confirm the definite aetiology of the chronic cough in this patient.

HRCT showed NSIP in this patient. In general, interstitial lung disease (ILD) is categorised into cases that are associated with known causes and those that are idiopathic. The most common causes of ILD are exposure to occupational or environmental agents, drugs, and radiation.⁸ The two most common causes of idiopathic interstitial pneumonia (IIP) are idiopathic pulmonary fibrosis (usual interstitial pneumonia [UIP]) and NSIP.⁹ Idiopathic pulmonary fibrosis typically presents with insidious onset of dyspnoea and non-productive cough over several months in a patient over 60 years old with features of UIP on HRCT.¹⁰ NSIP can be idiopathic or associated with HIV infection, drugs, connective tissue disease, and hypersensitivity pneumonia.¹¹ In a young female, autoimmune disease should be considered as a differential diagnosis. The

differential diagnosis of NSIP in connective tissue diseases is systemic lupus erythematosus (SLE), Sjögren's syndrome, and systemic sclerosis; NSIP can be present in RA but is less common than UIP.¹¹ Furthermore, this patient did not have features of SLE, such as butterfly rash, oral ulcers, alopecia, or systemic sclerosis features, such as skin thickening and hardening over fingers, hands, and face, digital tip ulcers, or Raynaud's phenomenon.

Some patients with IIP have features that suggest underlying autoimmune diseases but do not meet the established criteria for a connective tissue disease. This is the most likely explanation for the chronic cough in this patient. This condition is termed 'interstitial pneumonia with autoimmune features' (IPAF).¹²

Table 1. Classification criteria for IPAF.¹²

1. Presence of interstitial pneumonia (by HRCT or surgical lung biopsy) *and*,
2. Exclusion of alternative aetiologies *and*,
3. Does not meet criteria of a defined connective tissue disease *and*,
4. At least one feature from at least two of these domains:
 - A. Clinical domain
 - B. Serologic domain
 - C. Morphologic domain

A. Clinical domain:

Distal digital fissuring or tip ulceration, inflammatory arthritis or polyarticular morning joint stiffness ≥ 60 min, palmar telangiectasia, Raynaud's phenomenon, unexplained digital oedema and Gottron's sign

B. Serologic domain:

ANA titre $\geq 1:320$ with diffuse, speckled, or homogenous patterns; ANA of any titre with a nucleolar pattern; ANA of any titre with centromere pattern, rheumatoid factor $\geq 2\times$ upper limit of normal, anti-CCP, anti-dsDNA, anti-RO, anti-LA, anti-ribonucleoprotein, anti-Smith, anti-topoisomerase, anti-Trna synthetase, anti-PM-Scl, anti-MDA-5

C. Morphologic domain:

HRCT appearance suggestive of NSIP or other IIP; histologic patterns or features of NSIP or another IIP, multicompartiment involvement such as unexplained pleural effusion or thickening, unexplained pericardial effusion or thickening, and unexplained intrinsic airways disease

The importance of this case report is in highlighting a case with a diagnostic challenge in primary health care and lessons that we can learn to improve patient management in the future. As primary health care providers, we must be thorough in our clinical assessment and detailed in history taking so that we do not overlook any important information that could help us to obtain a correct diagnosis and ensure optimal management for the patient. Multidisciplinary involvement, such as with a family medicine specialist, respiratory physician, rheumatologist, or radiologist, is important in the management of certain cases, especially those that present with atypical symptoms and are not straightforward.

Conclusion

This case is an example of how a common complaint like chronic cough leads to a delay

in diagnosis if not investigated or managed properly. Autoimmune disease should always be a differential diagnosis in any young female presenting with chronic cough in primary care.

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Conflicts of interest

The authors declare there are no conflicts of interest relevant to this article.

Patients' consent for the use of images and content for publication

Informed consent was obtained before preparation of the case report.

What is new in this case report compared to the previous literature?

- This case report highlights an example of a case that presented in an atypical way that misled the attending doctor in diagnosis and delayed appropriate management of a young female with chronic cough. These lessons may be beneficial to other primary health care doctors to avoid making the same mistakes.
- This case report highlights how the most common complaints in primary health clinics can represent an atypical initial presentation of a certain disease. This case encourages the treating physician to search vigilantly for clues to come to a correct diagnosis.

What is the implication to patients?

A proper assessment of the cough would have avoided initiation of unnecessary treatment, such as bronchodilators or LTBI treatment. Obtaining a correct diagnosis will ensure appropriate management of her symptoms.

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CASE REPORT

Unilateral sudden sensorineural hearing loss in post-COVID-19 patients: Case report

Meng Yee Wong, Wei Shuang Tang, Zahirrudin Zakaria @ Azidin

Wong MY, Tang WS, Zakaria Z. Unilateral sudden sensorineural hearing loss in post-COVID-19 patients: Case report. *Malays Fam Physician*. 2022;17(2):112-116. <https://doi.org/10.51866/cr.134>

Keywords:

COVID-19, Sensorineural, Hearing loss, Vertigo, Labyrinthitis

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Abstract

Sudden sensorineural hearing loss (SSNHL) is an otologic emergency. Sensorineural hearing loss needs to be distinguished from conductive when patients present with sudden hearing loss at the primary care level. Prompt diagnosis of sensorineural hearing loss with pure tone audiometry and immediate treatment by an otolaryngologist can improve the hearing outcome. To date, few case reports exist about SSNHL among post-COVID-19 patients, and none were reported in Malaysia. Here, we present two cases of SSNHL in patients after COVID-19 infection. We wish to highlight the association of SSNHL following COVID-19 infection for timely referral towards better audiology outcomes. Permanent hearing loss will lead to another negative impact on the long-term quality of life of COVID-19 patients.

Introduction

Sudden-onset sensorineural hearing loss (SSNHL) is hearing loss of at least 30 dB in at least three consecutive audiometric frequencies that has developed within 72 hours.¹⁻⁴ SSNHL is usually unilateral.⁵⁻⁷ The main causes of SSNHL include viral infections, vascular occlusion, abnormal cellular stress responses within the cochlea, and immune-mediated mechanisms.⁸ Sensorineural hearing loss can be distinguished at the primary care level by examination using an otoscope and testing using a 512-Hz tuning fork.^{4,9}

COVID-19 is a new pandemic caused by a novel coronavirus, SARS-CoV-2. A wide range of complications following COVID-19 infection have been studied, and primary care physicians are directly involved in the rehabilitation of post-COVID-19 patients. SSNHL is a rare complication and should be identified by the primary care team and referred to an otolaryngologist urgently.^{4,9}

Case Presentation

Case 1

A 35-year-old Chinese gentleman presented to the health clinic 8 weeks after contracting COVID-19. He had tested positive for COVID-19 by reverse transcription polymerase chain reaction. He was asymptomatic during the initial diagnosis and classed as Category 1. He had anosmia on day 5 of his illness. He completed his home quarantine with no

complications. He presented with sudden hearing loss in the left ear, which had occurred 3 days prior, on awakening. This was associated with vertigo and left aural fullness. He denied any history of trauma, upper respiratory infection, exposure to loud noise, recent air travel or taking any regular medication before the onset of hearing loss. He had worked as an engineer in the same factory for 11 years. He had no history of smoking or other substance use.

On examination, the patient was afebrile and normotensive with a regular pulse. Otoloscopic examination revealed intact tympanic membranes. Bedside testing showed a positive Rinne's test over the affected ear, with Weber's test lateralised to the opposite ear. His gait was normal with no cerebellar sign. The Dix-Hallpike manoeuvre was performed, which was negative. He was referred urgently to the ENT department for further evaluation and treatment.

The patient proceeded with an audiology assessment. Tympanometry was normal. Pure tone audiometry (PTA) showed a unilateral profound sensorineural hearing loss on the left side (**Figure 1A**). He was treated with oral prednisolone 1 mg/kg/day (60 mg daily) for 10 days in a tapering dose, betahistidine 24 mg twice daily and mecobalamin 500 mcg thrice daily. He was scheduled to be reviewed after 10 days along with PTA. However, his vertigo worsened and he was admitted

to a private hospital, where investigations were carried out to look for the cause of SSNHL. A baseline blood investigation was performed, and the result was unremarkable. Autoimmune screening and VDRL were negative. A brain MRI showed no neurovascular lesion or tumour. The facial and vestibulocochlear nerves were normal. He was additionally given tanakan 40 mg thrice daily on discharge.

During follow-up, distortion product otoacoustic emission was performed, and the report showed reduced emission of the left ear. Subsequently, his hearing showed improvement clinically (**Figures 1B and 1C**).

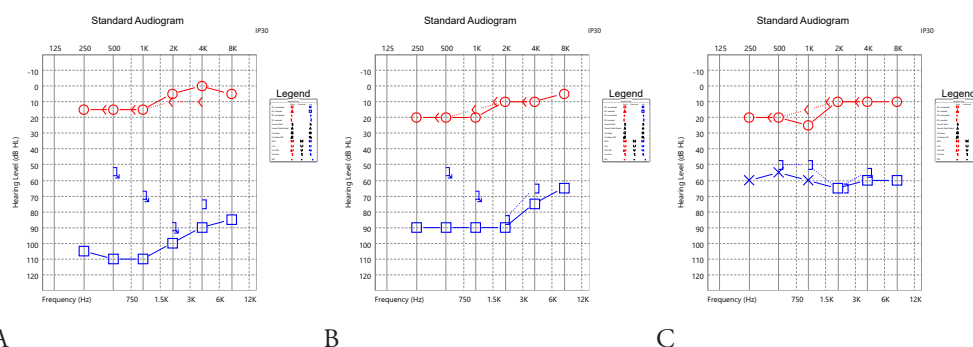


Figure 1. Interval audiograms. A. Initial on post-COVID-19 day 56. B. Day 17 of SSNHL (post-COVID-19 day 72). C. Day 39 of SSNHL (post-COVID-19 day 94).

Case 2

A 45-year-old Malay gentleman who had tested positive for COVID-19 by RTK-Ag (swab test) was admitted to the Low-Risk COVID-19 Quarantine & Treatment Centre for 4 days for breathlessness and classed as Category 2. On post-COVID-19 day 20, he presented with a new onset of left otalgia, vertigo and vomiting for 4 days. He also had left ear discharge, aural fullness and sporadic fever for 2 days. His symptoms did not improve with oral and topical antibiotics taken from a GP clinic. Before COVID-19 infection, he had been systematically well. On examination, his vital signs were within normal ranges. Left tragal tenderness was observed, with an absence of mastoid or pinna tenderness. Otoloscopic examination revealed pus discharge at the left ear, and the tympanic membrane was not visible. The nose and throat examinations were unremarkable. He was referred to the otolaryngology department as left otitis media and reviewed on the same day by the on-call medical officer. Left ear toileting was performed, and otoscopic examination revealed a vesicle at

the left pinna. The patient was treated as left otitis externa with a differential diagnosis of herpes zoster oticus and discharged with oral antibiotic and antiviral medication.

At follow-up after 1 week, his symptoms had slightly improved, but he had developed left-sided facial weakness and left ear tinnitus 2 days before the appointment. The assessment of facial nerve function on the left side was House–Brackmann Grade II. Audiologic assessment showed a normal tympanogram bilaterally, and PTA showed left moderate-to-severe sensorineural hearing loss (**Figure 2A**). The diagnosis was revised to left Ramsay–Hunt syndrome (RHS). Oral acyclovir was continued with the addition of Neurobion 1 tablet daily and oral prednisolone 30 mg twice daily for 1 week. During follow-up, he was given another course of oral prednisolone 30 mg twice daily for 1 week, then tapered over 9 days. Subsequently, he was treated with intratympanic dexamethasone 0.5 mL. Little clinical or audiologic improvement was seen after 2 months, although the left facial nerve palsy and vertigo had resolved.

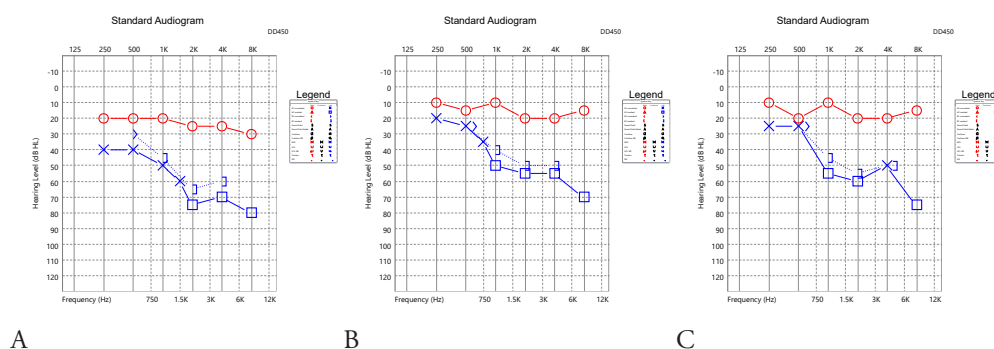


Figure 2. Interval audiograms. A. Initial on day 7 of SSNHL (post-COVID-19 day 27). B. Day 18 of SSNHL (post-COVID-19 day 38). C. Day 48 of SSNHL (post-COVID-19 day 68)

Discussion

Hearing loss following COVID-19 infection is not fully reviewed, despite this symptom having been seen in patients with both COVID-19 and influenza.¹ A systematic review revealed a direct association between COVID-19 and SSNHL, as in other viral infections. It postulated three pathophysiology mechanisms:

- (1) Coronavirus could damage the auditory centre in the temporal lobe.
- (2) Coronavirus could change the microvascular structure functions of the inner ear, resulting in a thrombus or an embolus that interrupts the blood flow to the inner ear.
- (3) Any multi-organ involvement could occur, or a direct peripheral injury could occur to the sensory cells of the cochlea due to neurotropism of coronavirus.⁶

Kilic *et al.* reported five patients with SSNHL as the sole symptom of COVID-19 infection and highlighted that it could be a non-specific symptom of this viral infection.¹⁰ COVID-19 infection has been shown to cause delayed effects on both the central and peripheral nervous systems via an immune-mediated mechanism.¹¹ Several cases have reported unilateral as well as bilateral SSNHL in post-COVID-19-infected patients.¹²⁻¹⁵ A case report suggested screening for hearing loss for inpatients to avoid missing the treatment window.¹ The latest CPG recommended corticosteroids may be offered to patients presenting within 2 weeks of symptom onset. Treatment decisions, including the mode of administration of steroids, are made based on shared decision-making with patients after benefits-harm assessment.⁴

Though both patients presented with vertigo, benign paroxysmal positional vertigo and vestibular neuritis had been ruled out in the presence of sensorineural hearing loss.¹⁶

Vestibular neuritis occurs due to a viral or post-viral inflammatory disorder affecting the vestibular portion of the cranial nerve VIII. The patient will present with severe vertigo, nausea, vomiting and gait imbalance. When these symptoms are combined with auditory problems, it is called labyrinthitis.¹⁷ Labyrinthitis following COVID-19 infection has been reported, and the use of corticosteroids is controversial because it is a self-limiting condition.^{16,18}

A systemic review revealed the association of audio-vestibular disorder with new SARS-CoV-2 infection, which manifested as sensorineural hearing loss, vertigo and tinnitus.¹⁴ However, audio-vestibular dysfunction is a rare consequence of COVID-19 infection.¹⁶

We have presented two relatively young patients with no known comorbid nor otological pathology who developed SSNHL after COVID-19 infection. Our first case was a Category 1 COVID-19 patient who developed SSNHL 8 weeks following COVID-19 infection. All investigations looking for the cause of his SSNHL were negative. Hence, the association of COVID-19 infection causing the SSNHL is likely. Prompt treatment with oral prednisolone showed improvement in this case.

Our second case developed Ramsay Hunt syndrome (RHS), which is also known as herpes zoster oticus, following COVID-19 infection. RHS is caused by the reactivation of the varicella zoster virus (VZV) in the geniculate ganglion of cranial nerve VII. It is characterised by a classic triad of auricular pain, ipsilateral facial nerve palsy and vesicles at the auditory canal. Three types are described based on the complexity of the clinical presentation. Type I manifests as

otalgia and herpetiform rash. Type II adds ipsilateral peripheral facial palsy to Type I. Type III, the most severe form, which was seen in our second case, affects the ipsilateral vestibulocochlear nerve along with Type II manifestations.¹⁹ A study has shown that VZV has around a 5 times higher risk among COVID-19 patients, though the exact pathophysiology is yet to be elucidated.²⁰ However, RHS is rarely reported.¹⁹

Conclusion

SSNHL is an otologic emergency similar to stroke and myocardial infarction in primary care. Hence, awareness of SSNHL following COVID-19 infection should prompt primary care physicians to refer patients with SSNHL, especially post COVID-19 infection, to a

tertiary centre for audiology assessment. Early diagnosis and intervention may be possible in improving the hearing outcome.

Acknowledgements

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Conflicts of interest

The authors report no conflict of interest.

Patients' consent for use of images and content for publication

Written consent was obtained from both patients.

How does this paper make a difference to general practice?

- Sudden sensorineural hearing loss can occur following COVID-19 infection.
- Urgent referral of post-COVID-19 patients who present with hearing loss or herpes zoster oticus for audiology assessment and treatment by an otolaryngologist is crucial.

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CASE REPORT

Tennis racket sign in pulmonary tuberculosis: A case report

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Ng KS, Lau CKS, Ngu PH. Tennis racket sign in pulmonary tuberculosis: A case report. *Malays Fam Physician*. 2022;17(2):117-120.<https://doi.org/10.51866/cr1353>**Keywords:**

Migrant worker, Pulmonary tuberculosis, Tennis racket sign, Sputum acid-fast bacillus smear

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Territory of Kuala Lumpur, Malaysia**Abstract**

We report a case of 'tennis racket sign' in the chest radiograph of a patient with pulmonary tuberculosis (PTB). This graphic but relatively unknown sign helped us pinpoint the diagnosis. Our patient, a 24-year-old male migrant worker, presented with a five-month history of a racking cough with expectoration of blood-streaked sputum. No antecedent fever existed, but he had a concomitant loss of appetite and weight. He was seen in three different primary care facilities, and three chest radiographs were performed. These radiographs were reported as normal, with no overt evidence of pulmonary infection. Antibiotics were not useful. We believed that the history and our finding of scattered, fine crepitations in both upper zones of the lungs warranted a repeat chest radiograph. This demonstrated shadowing that we recognised as the tennis racket sign. We told the patient that the radiological shadow pointed to the diagnosis of PTB. We were able to convince the patient and his employer that the bacteriological presence of *Mycobacterium tuberculosis* needed to be confirmed by sputum acid-fast bacillus (AFB) smear and culture. Sputum AFB smears on three different days were positive. Because of financial constraints, the patient requested referral to the government Chest Clinic (Klinik Dada) for treatment. This case report highlights a good learning point for the primary care physician evaluating a chronic cough with a chest radiograph. A 'normal-looking' chest radiograph does not rule out PTB. PTB may manifest radiographic patterns we are not familiar with; the tennis racket sign is a good case in point.

Introduction

Tuberculosis (TB) is a chronic airborne infectious disease caused by *Mycobacterium tuberculosis*. According to the World Health Organization (WHO), TB was the leading cause of death among adults from a single infectious disease worldwide in 2018.¹

Malaysia is currently classified as an intermediate TB burden country by the WHO, with an incidence rate of 92/100,000 population, but it is outranked by countries such as Thailand, Indonesia, Vietnam, Cambodia and the Philippines, which are high TB burden countries.^{1,2}

In 2020, Kaur et al. reported that TB had become the leading cause of death among infectious diseases in the past ten years in Malaysia, with a mortality rate of 5.56 per 100,000 population.¹

Since the introduction of the National Strategic Plan for Tuberculosis Control from 2011–2015, notified TB cases increased 17.2% from

20,666 cases in 2011 to 24,220 cases in 2015.³

In 2011–2015, non-Malaysians represented 12% to 14% of TB cases in Malaysia.³ TB cases among non-Malaysians increased from 2,870 cases in 2011 to 2,969 cases in 2015.³ Indonesia (33%) and the Philippines (31%) are major contributing countries for TB cases among non-Malaysians.³ TB in Malaysia has been aptly described as a 'disease sans borders' because of the influx of foreigners, many of whom are migrant workers.

Case Presentation

A 24-year-old male migrant worker came to our clinic with the chief complaint of five months' history of cough. No antecedent fever existed, and the cough had come on insidiously. It then escalated into a racking cough that periodically brought blood-streaked sputum. He had loss of appetite, and his weight plummeted from 65 to 57 kilograms.

The patient had been seen in three different primary care facilities, and three chest

radiographs were performed. These radiographs were interpreted as normal, with no overt evidence of pulmonary infection. He was prescribed antibiotics, but with no effect.

The patient had always enjoyed good health. No one in his immediate family in his country of origin had TB. He had been working in Malaysia for three years and had three mandatory foreign workers' examinations; on all occasions, he was certified healthy. As far as he knew, none of his fellow workers had TB. He did not smoke.

On examination, auscultation of the lungs revealed scattered, fine crepitations in both upper zones of the lungs. No other abnormal finding was encountered.

Laboratory investigations

ESR 30 MM/HR, haemoglobin 14 G/DL, platelet count $269 \times 10^9/L$, WBC count $8.2 \times 10^9/L$. Differential count: neutrophil 72%, lymphocyte 12%, monocyte 12%, eosinophil 4%. FBS 5.5 mmol/L. The renal function tests, lipid profile and liver function tests were normal. Sputum acid-fast bacillus (AFB) smears were positive on three different days.

Some months before the onset of his cough, the patient had a mandatory foreign worker's medical examination. The examination included a chest radiograph, HIV, hepatitis B surface antigen and VDRL. All tests were negative, and he was certified fit.

Chest radiograph



Figure 1

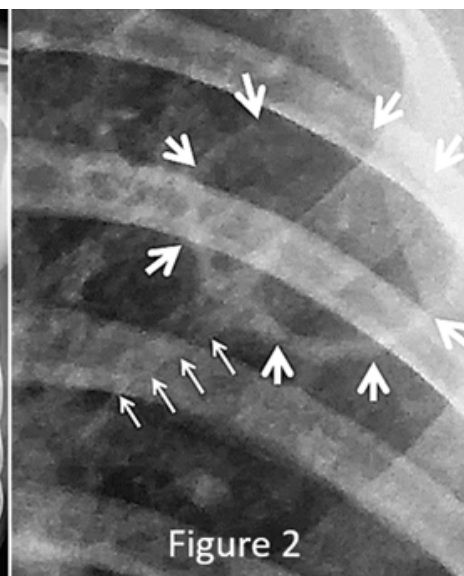


Figure 2

Figure 1. Chest radiograph shows 'tennis racket sign' in the left upper zone. A small cavity is present in the right upper zone. **Figure 2.** 'Tennis racket sign', magnified view.

Unfortunately, the three chest radiographs taken in his previous consultations were not in his possession and thus not available for comparison. The chest radiograph in our clinic vividly demonstrated the 'tennis racket sign'.

Because of financial constraints, the patient requested that he be referred to the government Chest Clinic (Klinik Dada) for treatment.

Challenges we faced

For this patient, we faced several challenges. The first was communication. The patient did not have a good command of Bahasa Malaysia, and we were not conversant with his native tongue.

Secondly, the employer was sceptical of our diagnosis of PTB. Three previous radiographs were read as normal by three primary care physicians, and the patient had a recent mandatory examination that certified him fit and free of infectious disease.

Thirdly, investigations such as the sputum AFB smear and culture were costly and would involve more trips (and lost working days) to our clinic. He had to come to our practice on three days from a plantation more than an hour's drive away.

However, when we showed the migrant worker and his employer the pictorial outline of a tennis racket on the chest radiograph, they agreed to sputum AFB smears.

In **Figure 1**, two distinct cavities are seen. The smaller of the two is situated in the periphery of the right rib cage and overlies the fourth rib. In the left lung is a much larger cavity; its upper border reaches the fourth left rib, and the lower border sits in the intercostal space between the fifth and sixth rib. No patchy parenchymal opacity exists in the upper zones of both lungs. The radiological pattern on the left upper zone is the tennis racket sign.

In **Figure 2**, the bold arrow heads outline the circumference of the tennis racket head; thin arrows point to the tennis racket handle, which extends medially towards the hilum. These two features fuse to form the tennis racket sign (**Figure 3**).

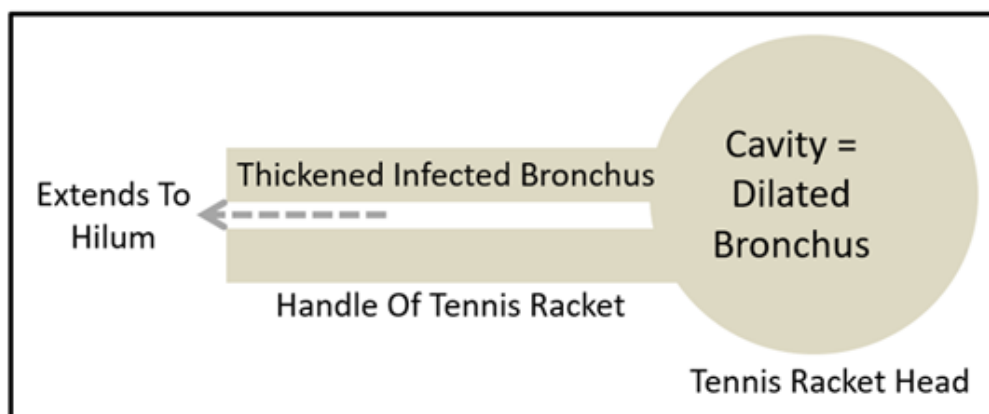


Figure 3. Diagrammatic representation of the ‘tennis racket sign’.

Discussion

Genesis of tennis racket sign

The TB disease is predominantly in the bronchus; the infected walls of the bronchus are thickened, with narrowing or occlusion and dilatation beyond. The cavity is in fact the dilated bronchus, reminiscent of a tennis racket head. Microscopic studies have shown that the wall of the cavity or the tennis racket head has bronchial wall histological features, with or without tuberculosis foci in it.^{4,5}

The rest of the dilated bronchus extends medially towards the hilum. This infected bronchus graphically mimics the narrow shaft or handle of the tennis racket. This draining bronchus of the tuberculous cavity is either concurrently or secondarily infected.

The dilated bronchus (head of tennis racket) and the draining bronchus (handle of tennis racket) come together to form the tennis racket sign (**Figure 3**).^{4,5}

Tennis racket sign as an aid to the diagnosis of post-primary PTB

The chest film is the mainstay in the radiologic evaluation of suspected PTB. However, this tool has limitations. A normal chest radiograph does not rule out tuberculous infection. The picture of PTB in the chest

radiograph can be variable. Radiographic shadowing can range from typical upper lobe infiltrates to atypical solitary lower lobe opacity. Atypical morphological characteristics are often seen in the chest radiographs of the immunocompromised population with PTB.

Reading chest radiographs is also fraught with high inter- and intra-reader variation. Most cases of post-primary PTB are easily recognised by the bilateral, patchy, ill-defined parenchymal opacities, located in the apical and posterior segments of the upper lobes, followed in frequency by the superior segment of the lower lobes and the anterior segment of the upper lobes.⁶ The hallmark of post-primary PTB, the cavities, are the ring shadows sitting amidst the fluffy cotton wool opacities. In our patient, no parenchymal opacities were visible, and this was perhaps the stumbling block to early diagnosis. In the absence of florid parenchymal infiltrates in the radiographs, the sighting of the tennis racket sign (in addition to the history and physical findings) prompted us to look for *Mycobacterium tuberculosis*.

Tennis racket sign and high grades of bacteriological presence

Shital⁴ believes that the tennis racket sign is a strong predictor of active pulmonary TB. Takhar⁵ asserts that “the presence of

'tennis racket' sign endorses higher grades of bacteriological presence". In our patient, who was not previously treated for TB, the tennis racket sign was seen, and tubercle bacilli were demonstrated in the sputum AFB smear tests.

Studies have found that the number of tubercle bacilli in different types of tuberculous lesions varied substantially. The number of bacilli in an encapsulated solid nodule, 2 cm in diameter, having no communication with the bronchus, ranged from about 100 to not more than a few thousand. However, a cavitary lesion of the same dimensions may harbour astronomical figures of bacilli, ranging from 10 million to 1 billion bacilli.^{4,5} Of course, such cavities are likely to discharge enormous quantities of bacilli and facilitate diagnosis by the sputum AFB smear examination. Shital noted that the tennis racket cavity was not commonly described in the literature as a predictor of active pulmonary TB. They confirmed higher grades of bacteriological yields in AFB smear examination in cases with this cavity.⁴

Thus far, we have only been able to locate a few single case reports of the tennis racket sign with documented bacteriological presence of *Mycobacterium tuberculosis*. We have not been

able to find other literature to confirm that the tennis racket sign is a strong predictor of active pulmonary TB.

Conclusion

In general practice, easy access and low cost make the chest radiograph the usual initial investigative modality in a patient with the provisional diagnosis of PTB. Primary care physicians must be aware that the radiographic picture of PTB may be atypical. The chest radiograph with a tennis racket sign is an aid to the diagnosis of post-primary PTB, and the bacteriological presence of *Mycobacterium tuberculosis* must be confirmed.

Conflict of Interest

The authors declare they have no conflict of interest that are directly or indirectly related to the report.

Ethical Statement

Informed consent has been obtained from the patient prior to the writing of this report for publication purposes.

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No funding was received for this report.

What is the implication to patients?

Awareness that radiographic pictures of PTB may be atypical is especially relevant for the immunocompromised, the paediatric age group and adults with primary PTB.

The cavity is the hallmark of post-primary PTB. This case report of the tennis racket sign demonstrates a cavity that is different from the usual ring shadows. This picture of a tennis racket sign is a useful aid in the diagnosis of post-primary PTB.

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LETTER TO EDITOR

Mixed messages and the disparity between various levels of care in chronic kidney disease management

Jazlan Jamaluddin, Mohd Yusaini Mohd Yusri

Jamaluddin J, Mohd-Yusri MY. Mixed messages and the disparity between various levels of care in chronic kidney disease management. *Malays Fam Physician*. 2021;17(2):121-122. <https://doi.org/10.51866/lte.171>

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Dear Editor-in-Chief,

We have read the review article by Cheo SW et al.¹ (the authors) with great interest. The authors have concisely summarised a practical approach to the management of chronic kidney disease (CKD) in primary care. Patients with CKD are most often managed in primary care; therefore, primary care doctors play a significant role in the management of CKD. Local national guidelines have recently been updated to reflect the most recent trends in management of CKD at the time of development and further guide clinical management, especially in primary care. However, we found several recommendations in the review article that did not coincide with the most recent Malaysian clinical practice guidelines (CPGs) on the management of CKD in adults.²

First, the authors recommend that all patients with CKD should undergo an ultrasound (USG). In contrast, the CPGs recommend that USG should be performed only if indicated, namely in patients with rapid deterioration of renal function, presence of haematuria, symptoms or history of urinary tract obstruction, family history of polycystic kidney disease and age over 20 years, or when a renal biopsy is indicated. This is based on the first edition of the CPGs, which reference the older national CKD guidelines from the United Kingdom (UK) Royal College of Physicians from 2008. The guidelines have been superseded by two newer editions of the national guidelines. In the latest guidelines published late last year, only one additional indication was added: if a patient's glomerular filtration rate (GFR) is less than 30 ml/min/1.73 m² (GFR category G4 or G5).³ Considering that a renal USG generally does not change the management of CKD and its scarcity in primary care due to various limitations, we tend to agree with the recommendations of the CPGs.

Second, the authors' recommended blood pressure (BP) target for patients with diabetes or those without diabetes and with proteinuria >1 g/day was <130/80 mmHg, while the CPGs recommend a BP target of ≤130/80 mmHg (SBP 120–130 mmHg). For patients without diabetes and with proteinuria <1 g/day, the target BP recommended by the authors was <140/90 mmHg, as compared to the ≤140/90 mmHg (SBP 120–140 mmHg) recommended in the CPGs. Although these two recommendations differ only in their mathematical symbols, it is important to understand how these targets were determined based on various studies. More importantly, these targets should be tailored not only to patients' comorbidities, but also to various biopsychosocial aspects of a patient, considering the potential adverse effects of a strict BP target.

Third, the authors recommended treatment with lipid-lowering therapy only if patients fulfil certain criteria. This recommendation was based on an American guideline for primary care developed by internists and nephrologists, in addition to the KDIGO guideline published in 2013. Meanwhile, the authors acknowledged the association between cardiovascular (CV) morbidity and mortality and CKD. Similarly, the CPGs recognise the high CV risk in patients with CKD. Therefore, the CPGs recommend the use of statins in patients with CKD for primary and secondary prevention of CV events. This recommendation is echoed in the 2019 European guidelines for the management of dyslipidaemias, which has also been adopted by the latest CPGs on the management of type 2 diabetes.^{4,5} Comprehensive management of patients with CKD, including optimisation of their overall CV risk, is paramount in reducing overall morbidity and mortality.

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Fourth, the authors suggest routine measurement of serum parathyroid hormone (PTH) or even bicarbonate for patients with CKD stage G3 and above. However, neither test has been recommended for routine measurement in the CPGs. Nevertheless, the CPGs recommend the measurement of serum calcium, phosphate, and alkaline phosphatase (ALP) for monitoring of CKD-associated mineral and bone disorder (MBD). Similarly, the UK and KDIGO guidelines recommend repeating PTH measurement only in advanced CKD or CKD progression.^{3,6} Because the principle of treatment for CKD-MBD is to reduce the phosphate level to a normal level, routine measurement of PTH in primary care is not cost effective. Although evidence to support the measurement of sodium bicarbonate in CKD is emerging, the guidelines that the authors referenced only recommend the measurement of sodium bicarbonate in patients with hyperkalaemia and metabolic acidosis. However, the authors and CPGs already recommend that these patients, specifically those with persistent serum potassium abnormalities, be referred to nephrology. Furthermore, the serum bicarbonate test is sensitive to temperature and is not widely available in primary care. Therefore, understandably, the CPGs have not recommended these tests be performed in primary care.

Finally, mixed and conflicting recommendations, even those from various local guidelines, are often encountered, especially because medicine is evolving so rapidly. Ideally, any deviation from major guidelines or new updates should always be explained to readers. We applaud the developmental group of our national guidelines for including practitioners from various levels of care, including primary care doctors and family medicine specialists, in the development of the CPGs. Practical approaches are important to manage patients in primary care who already face various challenges, including limited availability of more effective medications, such as single-pill combination antihypertensives, sodium-glucose co-transporter 2 inhibitors, lipid-lowering therapy, monitoring equipment, and investigation facilities. To combat the CKD epidemic, it is time to increase emphasis on preventive care, especially in primary care, which has proven to be more cost-effective. This would include better allocation of treatment options and investigation facilities. Furthermore, shared decision-making and close collaboration between different levels of healthcare should be strengthened to successfully manage CKD.

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LETTER TO EDITOR

Reply letter to: Mixed messages and the disparity between various levels of care in chronic kidney disease management

Seng Wee Cheo, Qin Jian Low, Tzyy Huei Lim, Woh Wei Mak, Chow Alexander Kok Yip, Koh Wei Wong

Cheo SW, Low QJ, Lim TH, et al. Reply letter to: Mixed messages and the disparity between various levels of care in chronic kidney disease management. *Malays Fam Physician*. 2021;17(2):123-124. <https://doi.org/10.51866/lte.171r>

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Dear Editor,

We read Jamaluddin et al.'s letter to the editor with great interest.¹ Most chronic kidney disease (CKD) patients are managed in primary care. The authors have highlighted the discrepancies between our approach and the Malaysian clinical practice guidelines (CPGs) on the management of CKD in adults.² As the author has correctly pointed out, medicine is evolving rapidly; therefore, there will be certain differences or discrepancies between different guidelines and reviews. Our review of the article is meant to provide some insight into the management of CKD in primary care.

First, regarding the first comment on the recommendation that all patients with CKD should undergo an ultrasound, the CPGs do not restrict ultrasounds to be performed only in patients with rapid deterioration of renal function, presence of haematuria, symptoms or history of urinary tract obstruction, family history of polycystic kidney disease and age over 20 years, or when a renal biopsy is indicated; rather, these are general indications of kidney ultrasound.² Ultrasound serves as a useful, non-invasive test to detect urinary tract obstruction or structural abnormalities.³ Furthermore, patients with urinary tract obstruction or congenital renal tract abnormalities may not present with typical symptoms, and deranged creatinine may be the first presentation.⁴ The KDIGO guideline also recommends that most CKD patients should undergo an ultrasound evaluation.⁵ In addition to structural abnormalities, renal ultrasound may detect renal masses, renal calculi, and abnormalities in the renal cortex. By diagnosing the structural abnormalities early, the patients can be referred for early urological intervention, which may potentially limit the damage to the kidneys and prevent further deterioration of kidney function. Overall, renal ultrasound is a helpful tool that CKD patients should utilise as it may potentially alter the management and disease course.

Regarding blood pressure targets, the target that is mentioned in our article is the same as the target recommended by the Malaysian CPGs, as in Jamaluddin's letter. There were typography mistakes made by the publisher, and an erratum has been published separately to rectify the errors.⁶ In terms of lipid-lowering therapy, we recommended that all CKD patients should undergo lipid evaluation, as dyslipidaemia is an important cardiovascular risk factor.⁷ In all CKD patients above 50 years old not on renal-replacement therapy (RRT), lipid-lowering therapy should be initiated. In contrast, in adults aged 18–49 years with CKD not on RRT, lipid-lowering therapy is recommended if the patient has one of the following indications: known coronary artery disease, diabetes mellitus, prior ischaemic stroke, or 10-year risk of cardiovascular event >10%.⁸ The rationale is that the risk of a coronary event is age-dependent in patients with CKD, just as it is in the general population. Although the absolute rate of cardiovascular events is generally lower in the population <50 years old, CKD patients with the aforementioned risk factors are generally considered to have a higher risk of developing a cardiovascular event and statin therapy is thus indicated.⁸ However, polypharmacy and potential drug toxicities need to be taken into consideration prior to initiation of statins.

Regarding parathyroid hormone (PTH) measurement, it should be performed if there is sufficient laboratory support. According to the KDIGO guidelines, PTH measurement should be performed at baseline and every 6–12 months in CKD stage 4 and more frequently in

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CKD 5.⁹ However, we understand the challenges faced by primary care practitioners, as PTH measurement is not widely available, and the same applies to bicarbonate. Serum bicarbonate testing is not widely available in primary care settings; however, it should be performed if testing is available.

Finally, this article aims to serve as a review of literature on the available resources; it does not replace the current guidelines. All treatment or management plans will have to be modified according to available resources in local settings.

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A MOMENT IN THE LIFE OF A FAMILY PHYSICIAN

Involvement with professional organisations: Is there a need?

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I have been actively involved with professional organisations since I completed my postgraduate training. Being a young Family Medicine Specialist (FMS) at the time, I felt that I should contribute and give back to the fraternity. Time passes by quickly and little did I realise, I am now ‘married’ to three prestigious professional organisations: the Academy of Family Physicians of Malaysia (AFPM), the Malaysian Family Medicine Specialists’ Association (FMSA), and The Rajakumar Movement (TRM) WONCA Young Doctors’ Movement in the Asia Pacific Region. Each of these organisations is special, with its own vision and mission; even the activities and programmes are unique in their own way. Regarding the question, ‘As an FMS, do we really need to get ourselves involved with the professional organisation?’ The answer is obviously ‘yes’. Yes, because it enriches our life experience.

Often, we join professional organisations because we want to stay united and have a stronger voice. However, it is far more than that. Getting involved with professional organisations has helped me broaden my network. I had the opportunity to know my seniors, colleagues, and juniors better. I learned how to interact with people with different personalities and characters. I still remember how I learned to equip myself with soft skills especially when reminding members to renew their membership. In TRM, I had the opportunity to work with young doctors from countries throughout the Asia Pacific Region. TRM is where I found new friendships and brotherhood. I am so glad and fortunate to have a young and energetic team who has been the pillar of these activities.

Over the past few years, I have also strengthened my governance and leadership skills. The guidance I received from the senior members of the organisation has always been invaluable and precious; it is something that money cannot buy and something that is not found in books. I was able to practice my leadership skills outside my workplace. Every experience I had and gone through added to the learning curve that would further broaden my horizons.

Working in a team is the essence of any organisation; it requires mutual understanding, collegiality, and the spirit of togetherness to successfully achieve the goal. There should not be any personal agendas. Everyone should contribute and connect the puzzle pieces for the betterment of the fraternity.

Holding important positions in my professional organisations has not been easy, and there are many challenges that I faced. However, it is my passion and love for the fraternity that drives me, and it is the support and kind words from my seniors and friends that motivate me to do more. I will continue to do the things that I love to do and will always work with a sincere heart.

Many of my friends have asked me how I am able to cope with it. I tell them, ‘you will need to find and make time for it; you will need to arrange your schedule and plan ahead’. There is certainly no secret. If I can do it, you can do it as well. Now, let’s get involved with professional organisations actively. Your involvement is important. It will be a rewarding and satisfying move.

ERRATUM

Mathematical symbol errors in the article 'A practical approach to chronic kidney disease in primary care'

Mathematical symbol errors in the article 'A practical approach to chronic kidney disease in primary care'. Malays Fam Physician. 2022;17(2):126. <https://doi.org/10.51866/er.001>

There were several mathematical symbol errors in the review article entitled 'A practical approach to chronic kidney disease in primary care' which was published online on 2 Mar 2022.¹ The $\geq$ and $\leq$ symbols were not detected by the system and wrongly converted to $>$ and $<$ during the formatting process. The article was corrected and reuploaded on the journal's website. We urge readers to download and refer to the correct version uploaded on our website.

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