

Prevalence and Risk Factors of Urinary Incontinence and its Impact on the Quality of Life and Treatment Seeking Behavior among Malaysian Women: A Review

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Abstract

Background: Reports of the prevalence of urinary incontinence (UI) in women seem to vary widely globally. This paper attempts to review the current literature on urinary UI, its prevalence, risk factors and quality of life (QOL) amongst Malaysian women.

Methods: Scopus and Medline search was made to access the databases. Both basic and advance search for articles on female UI among Asian women were sought. Epidemiology, risk factors, urinary symptoms in Asian females, ICIQ-SF questionnaire, BFLUTS questionnaire, QUID questionnaire, King's Health Questionnaire, prevalence, and QOL were some of the key words used to retrieve these articles. References related to relevant studies were searched manually. Relevant sources were identified from year 2001 to 2015. Observational studies and review articles were included. A total of 295 local and international publications were identified.

Results: A total of nine reports based on the Malaysian population were identified with their sample sizes ranging from 212 to 5502 participants. The 5502 participants were from ten other Asian countries. Documented prevalence in these studies ranged from 9.9% to 44%. Little was documented on the risk factors, types of UI, its effect on QOL or the treatment seeking behavior in these studies.

Conclusions: Information on UI in Malaysian women is incomplete and inconclusive; there appears to be a vital need to conduct a bigger national population based study using a validated standardized symptom-based questionnaire in various local languages with sufficient details to allow grading of UI severity and to accurately estimate the prevalence of UI, current risk factors, QOL and treatment seeking behavior. This will provide better information on the status of the problem, and the evidence documented will contribute towards the Malaysian body of knowledge in urology and clinical practice.

Keywords: Urinary incontinence; Validated questionnaire; Prevalence; Risk factors; Treatment seeking behavior; QOL; Review; Malaysia; QUID

Background

Urinary incontinence (UI), urgency or frequency of micturition may not be life-threatening in themselves but their impact on the affected woman's personal hygiene, psychological, social and sexual wellbeing is enormous. When patients complain about their urinary symptoms as "bothersome or troublesome" then it can be considered to be a hygienic and/or social problem [1]. Some have dubbed this as "the silent epidemic" because adults, particularly women, are reluctant to talk about their own personal, social and hygienic problem or seek treatment for it [2]. While UI has been well documented in the developed countries, the world-wide prevalence data is difficult to summarize and impossible to generalize to the general population in a

given area because of the large variations in the reported levels of its prevalence [3]. The reported prevalence rates seem to vary widely, not only between communities but also between studies within a single community. The Scientific Committee of the International Continence Society has, however, estimated that about 200 million adults worldwide are incontinent [4,5]. The prevalence of female UI is estimated to be between 25 and 45% worldwide [6,7].

The reported prevalence of UI in Malaysian women also appears to be wide and varied and the reason/s for this is not apparent. However, there has been no review of the literature to summarize the reported prevalence of UI, its types, its impact on the quality of life (QOL), risk factors and even treatment seeking behavior in Malaysian women. Hence, it is crucial to review previously documented Asian and Malaysian studies on the prevalence, types of UI, the associated risk factors and the QOL of the sufferer, spouse or family to get a better picture of the state of this problem in Malaysian women.

Methods

Online databases namely Cochrane library, Google Scholar, Scopus and Medline were accessed to perform both basic and advance search for articles on UI among Asian and Malaysian women from the year 2001 onwards. The Boolean operators were applied to key words that included epidemiology, risk factors of urinary symptoms or incontinence, frequency, urgency and Asian female. Other keywords used were International Consultation on Incontinence Short Form questionnaire (ICIQ SF), Bristol Female Lower Urinary Tract Symptoms-Short Form Questionnaire (BFLUTS), Questionnaire for Urinary Incontinence Diagnosis (QUID), King's Health Questionnaire, prevalence and quality of life. Although numerous world-wide studies on prevalence, risk factors and QOL of UI were made available, a specific search was made for Asian studies, particularly studies undertaken in Malaysia. Papers including studies on Malaysian women were identified and included in the review. Data on the study design, study setting (whether hospital based or community based), sample size, age range of subjects, type of questionnaire used, prevalence, and risk factors were extracted and tabulated.

Results

The search yielded only eleven publications from the years 2001-2015. One publication, on the topic of UI in the elderly and its management and written as a piece in the continuing medical education section of a local journal, was excluded because it did not contain any specific research data. The remaining ten publications included in the review are presented in chronological order starting from 2001 to 2015 in Table 1. The prevalence rates of UI reported in these studies ranged from 9.9 to 44.1%. Three of the studies were hospital or clinic-based, and on women attending outpatient clinics with no history of urologic or gynecological problems. One study was on nulliparous, single and not sexually active medical and nursing students at a local institute, one was on postmenopausal women and the remaining were small scale community based studies.

The first ever report on the epidemiology of overactive bladder symptoms and urge UI (UUI) among Malaysian women was in a study

on Asian women by Lapitan and Chye [8]. This study was a cross-sectional survey consisting of 5,506 Asian women that were carried out to determine the prevalence of overactive bladder and UUI in women in eleven Asian countries. Malaysian women accounted for 6.4% (351 women) of the total participants.

A 34-item multiple choice questionnaire, which was translated from the English language into the local dialects common to the people of these countries, was used. It was validated and administered by medically trained personnel. It is however, unclear which dialects were used in the questionnaire. Furthermore, whether the questionnaire used had undergone appropriate linguistic validation was also unclear and it is difficult to ascertain if it had in any way impacted the findings. The study design, sampling mode and inclusion and exclusion criteria was also vague. The Malaysian participants consisted of women attending two selected health center outpatient clinics [8,9], who had no history of urologic and gynecologic problems. The use of only two centers and not a population based study would certainly skew the findings and might not reflect the actual prevalence of UI. Amongst the 351 participants from Malaysia, 13.1% had reported some degree of UUI [9,10].

Overall, the prevalence of UI in the eleven Asian countries ranged from 10.6% in Indonesian women to 37.3% in Thai women [8]. Following this, there were numerous other studies estimating the prevalence of UI in Malaysian women. The prevalence rates reported in these were widely variable, where rates of 34.9% [10], 40% [11], 19% [12] and 9.9% [13] were reported.

A recent report had documented a prevalence of UI of 44.1% among married women living in Terengganu, a northern-eastern state in peninsula Malaysia [14]. A prevalence of 22.1% was also recently reported among postnatal women in Kelantan [15]. The prevalence of overactive bladder (urgency and frequency) in women living in Negeri Sembilan was reported as 19.1% [16]. None of these studies, however, documented the risk factors associated with UI, health related QOL or treatment seeking Behavior of Malaysian women with UI (Table 1).

	Authors	Country	Design	Setting	Subjects	Age	Questionnaire	Prevalence of UI and associated factors
1	The Asian Society for Female Urology (ASFU) Lapitan and Chye [8]	Eleven Asian countries including Malaysia, Philippines, Thailand, Indonesia, Singapore, India, Pakistan, Taiwan, Korea, Hong Kong, China	Cross-sectional, questionnaire survey	Women attending two health care outpatient clinics with no history of urologic or gynecological problems Women selected randomly	n=5502	18-70> years	Panel of experts from Asia Pacific Continence Advisory Board (APCAB) devised 34 items multiple choice, validated questionnaire translated from English language to local dialect	Malaysian women UI -13.1% (n=351) Asian women's risk factors included older age, multiparity; a positive family history, residence in a rural area and use of a sitting type of toilet, higher income, and manual labor.
2	Low et al. [12]	Kedah and Penang Malaysia	Cross-sectional, interview based survey	Women recruited by series of FLUTS Awareness campaign from various survey sites including hospitals, institutions and residential areas.	n=2732	>19 years	1 King's health questionnaire, and 2 questions from Bristol Female lower urinary tract symptoms (FLUTS) on SUI and UUI	64.5% (n=335) of the 519 patients with FLUTS had associated urinary incontinence. Risk factors were; age 50 years and older, parity of 4 or more, illiteracy, postmenopausal status, presence of one or more concomitant chronic medical illness

3	Dhillon et al. [11]	Some districts with the state of Kelantan, Malaysia	Cross-sectional, community-based survey	Post-menopausal women living within their communities. Convenience sampling.	n=326	40-70 years	Panel of women health experts at University Sains Malaysia devised the semi-structured menopause quality of life questionnaire in Malay language which was cultural congruent to the local population	SUI (40%) and UUI (24%) in association with Menopause Quality of Life
4	Sherina Mohd Sidik [13]	Sepang district Selangor, Malaysia	Cross-sectional, community based survey	Participants were from traditional villages, small towns and one indigenous village. Stratified cluster sampling.	n=263	60 years>	Translated Malay version of the Barthel's Index: Urinary incontinence	UI- 9.9% among the elderly (60>years), Risk factors; age, gender, depression, functional dependence and diabetes mellitus
5	Zalina et al. [10]	Educational institution at Ipoh Perak, Malaysia	Prospective, cross-sectional, institution-based survey	Nulliparous, single and not sexual active medical and nursing female students	n=200	18-29 years	Self-administered standardized questionnaire ICIQ-FLUTS (English and Malay language)	SUI 21.9%, UUI -11.6%, LUTS -52.7% consisting of overactive bladder, UI and avoiding difficulty respectively (51.3%; 34.9%/45.2%)
6	Samiah Yasmin et al. [14]	Outpatient clinic @Health centre Seberang Takir Kuala Terengganu, Malaysia	Cross-sectional, clinic-based survey	Married women who were patients at the clinic and could speak either English or Malay were selected. Systematic random sampling	n=480	20-60 years	A structured questionnaire using Bristol Female Lower urinary tract symptoms (BLUTS) questionnaire. A Malay language version was made available	UI - 44.1%; SUI-52%, UUI (19.1%), MUI (25.4%). Risk factors: married, younger and middle aged women, increase in BMI, parity, types of delivery, gynecological operation e.g. dilatation and curettage, hysterectomy.
8	Dhillon et al. [87]	9 districts of Selangor Malaysia	Cross-sectional, observational pilot study	Community dwellers living in Selangor. Simple random sampling	n=212 pilot study	20-78 years	Questionnaire Urinary Incontinence Diagnosis (QUID) Preliminary finding	Prevalence UI -20.3% SUI 41.9%, UUI-30.2% MUI 27.9%, Minimal urine leak- 41.5%. increased BMI, increased fat% was considered a risk factor
9	Dariah Mohd Yusof et al. [15]	Six maternal and child health clinics in 6 districts in Kelantan, Malaysia	Cross-sectional, clinic-based study	Postnatal mothers who had delivered 3-5 months ago; could read and comprehend Malay language. Convenience sampling	n=362	18-45 years	Self-completion questionnaire specifically for Traditional Malay Confinement Care (TMCC) and revised urinary incontinence scale including 26 other questions	PNUI-22.1% among post natal women in Kelantan. Risk factors: UI before pregnancy, UI during pregnancy, vaginal deliveries in younger women, maternal BMI, maternal age > 30 years old and instrumental deliveries, vaginal birth damage the tissues of the pelvic floor.
10	Ahmad, Aznal and Tham [16]	Tertiary hospital Negeri Sembilan Malaysia	Cross-section, hospital-based study	Women attending gynecological clinic for various diagnosis other than urinary problem. Universal sampling.	n=573	18-61> years	Self-administrated OAB-screener questionnaire as adapted from the International consultation on incontinence questionnaire (ICIQ). Translated to Malay language	Over active bladder -19.1%. Risk factors macrosomia babies, utero-vaginal prolapse, advanced age, high parity and menopausal more than 5 years

Table 1: Some Malaysian studies on female urinary incontinence: prevalence and risk factors.

Discussion

Prevalence and types of urinary incontinence

It appears that the reported prevalence of UI in women in Malaysia, as it is the case in a number of other communities, is wide and variable and the reason/s for the wide-ranging differences in the Malaysian studies remains unclear. In a review of seven studies investigating the prevalence of UI in Australia, Botlero et al. [17] found that the prevalence of UI reported in these studies, ranged from 12.8 to 46%. A

prevalence study using the Questionnaire for Urinary Incontinence Diagnosis (QUID) designed by Bradley et al. [18], reported an overall prevalence of UI in Australia at 41.7% [19]. Some have attributed these variations in prevalence rates to a lack of conformity among the prevalence studies, particularly in the usage of terminologies, definition of UI, demographics of the study population, survey and even study design [7,20]. During the literature search, no reports were found of studies conducted on Malaysian women to verify the different types of UI and/or if there were any differences in the prevalence and types of UI between ethnicity or how much of impact UI had on the

QOL among these women. A number of studies from other populations had indicated that mixed UI (MUI) was the commonest type of UI among Asian women (63.8%) followed by stress UI (SUI) (13.1%) [3,21-23]. Comparatively, Caucasian women experience more of SUI (50%) followed by MUI (29%) [3,21,22]. In addition, a significant difference in the prevalence of SUI between African-American (22%) and American Caucasian women (46%) has also been reported by Diokno [23]. Other American and Norwegian studies had reported MUI to be between 20 and 36% [23,33]. MUI is known to be more 'bothersome' and has a larger impact on QOL than other types of UI [1,7,24]. There is a clear need for more thorough studies to assess the types of UI and how it might impact the QOL of the sufferer.

In terms of the terminologies used, during the 1990s, terminologies like "stress incontinence", "urge incontinence", "dysuria" and "detrusor instability" were used in reports on lower urinary tract symptoms (LUTS) [25]. In its attempt to standardize the terminologies used and to reduce ambiguity, the 2002 International Continence Society (ICS) Report introduced major recommendations, making a number of terms obsolete and discouraging the use of other specific terms and phrases that were commonly used in publications and in clinical practice [5,25]. To examine the usage of these recommended terminologies, some members of the British Society of Urogynecologists searched articles indexed in the Scopus database over a period of a number of years [25].

Their findings suggested that even though the 2002 ICS report had recommended the replacement of terms like "dysuria" with "urethral pain" and "vulvodynia" with "vulva pain syndrome, there was, however, a poor adoption of the suggested words. Instead the usage of both "dysuria" and "vulvodynia" had grown. The qualifier word "urinary" was introduced to both SUI and UUI. Once again, only a modest increase in its use was observed in current papers [25]. "Urge incontinence" was used more widely than "urge urinary incontinence" before and after the 2002 ICS report. Interestingly, "urgency urinary incontinence" (UUI) had started to gain recognition from the year 2004, predating its inclusion in the 2009 report. "Neurogenic detrusor over-activity" was unrecorded in the Scopus database prior to 2002, and by 2004 was more commonly used [25].

"Genuine stress incontinence" became less common than the new term "uro-dynamic stress incontinence" and by 2005 it was still not as well used compared to the previous term "genuine stress incontinence". The study concluded that there remains confusion in the use of more obscure terminology and it might have significant implications both for clinical practice and for communication of research findings [26]. This might have compromised the interpretation of data in numerous studies determining the prevalence and the impact of UI on the QOL and might account for the widely variable prevalence of UI reported. In the Malaysian studies, however, the common terminologies used were 'lower urinary tract symptoms (LUTS), 'overactive bladder' (OAB), 'urgency', 'frequency', 'urinary incontinence', 'stress urinary incontinence' (SUI), 'urge urinary incontinence' (UUI), and 'mixed urinary incontinence' (MUI).

With respect to its definition, the two most commonly cited definitions of UI are those proposed in the 2002 ICS report, which defines UI as "the complaint of any involuntary leakage of urine [27], and the other by the Urinary Incontinence Guidelines Panel in 1996 that defined UI as "the involuntary loss of urine, which is sufficient to be a problem [28,29]. Both of these definitions are basically subjective and were used commonly in prevalence studies. Not only do these definitions not capture the extent or severity of the incontinence

problem, they are also very subjective in that the volume and frequency of leakage perceived by one individual might be different from the other. Some affected person may describe the same urine leak episode as either being very problematic while another may report the urine leak as not bothersome. Moreover, the ICS further states that incontinence always requires further definition/description and has to include factors such as type, frequency and severity of leakage, the effect on the QOL [6,28-30] and whether or not the individual wishes to seek treatment [5].

All of these have not been uniformly captured in all the studies including those on Malaysian women, and hence the widely ranging findings of the prevalence rates, types of UI, their severity and its effects on the QOL, between the numerous studies. This has led some to suggest the use of a validated tool to "quantify" the severity or impact of UI on QOL. For example, the Second International World Health Organization (WHO) Consultation on Incontinence recommended the use of the severity index developed by Sandvik et al. [30]. This tool utilizes frequency and volume of leakage to classify the incontinence as slight, moderate or severe. This index has been validated against pad weight tests and used in studies conducted by Sandvik et al. [30] and Nihira and Henderson [31] and as reported by Doughty [32]. Preliminary results from studies using this severity index have indicated a positive and significant correlation between the severity index and the patient's subjective rating of "bother" associated with the UI. Inclusion of all these will provide a better measure of the extent of the problem of UI in a population. Literature search did not find any Malaysian study that had explored the sufferers' perception of severity associated with UI and its impact on the QOL of the sufferer, spouse and family.

In addition to the use of standard terminologies and the severity index, it is also important that a standardized validated questionnaire is used when determining the prevalence of UI, its types, and quantifying its impact on the QOL. Currently, numerous validated and reliable international questionnaires are available to study the prevalence of UI but to determine the most user friendly and culturally congruent questionnaire for a population is daunting, particularly in populations where the native language is not English. Previous comparative studies between American [21,33], European [22] and Asian women [8] had used epidemiological questionnaire in the American English language to collect data from Malaysian women [9] who attended outpatient clinics. It is possible that some of the terms used in the questionnaires might not have been comprehensive to Malaysian women and to the investigators who had been mostly educated using the British education system. Moreover, some of the questionnaires had more emphasis on UI and may have failed to capture the extent of the UI or the various types of UI [23]. In a critique on the study of Lapitan and Chye [8], Diokno [23] pointed to a significant disparity in the prevalence of UI between studies conducted in US, Europe and Asia; sighting the methodology and research instrument (questions) used in the survey might be inappropriate as the questions used to establish the prevalence of UI in Asia were different from those used in the US and European survey [23]. The presence of UI was ascertained by a positive response to the question of ever having leaked urine before reaching the toilet. The question appeared to be leading towards an answer favoring UUI. It was further stated that the discrepancy between the rates in Asia and that in women from Europe and America could also be attributed to the method and questions used, including the cultural difference and ethnicity that might have contributed to the discrepancies [23]. It therefore appears that many factors have to be considered when

choosing the most appropriate tool to collect data on UI. Apart from those studies cited in Table 1, no large scale local population based study, using validated questionnaire translated into the local languages, has been conducted on Malaysian adult women of all age groups nationally. The studies cited in Table 1 have mainly been at small localities in the various states of Malaysia, each using a different questionnaire. Most recent local studies have been community or clinic based cross-sectional studies using English language questionnaires either from Britain or America. Low et al. [12], in their study on Malaysian women aged 19 years and above and living in Penang and Kedah, had used the King's Health Questionnaire, International Prostate Symptoms Score QOL assessment index and Bristol Female Lower Urinary Tract Symptoms Questionnaire (BFLUTS) in local dialect and English language. The same questionnaire in the Malay language was recently used by Samiah [14] in Terengganu to report on the prevalence of UI and associated risk factors among married women. Mohd Sidik [13] had used a validated Malay version of the Barthel's Index (BI) in a cross-sectional study to determine the prevalence of UI and its associated factors among the 223 elderly women living in a rural community in the Sepang district in Selangor and approximately 1 in 10 (9.9%) were reported inflicted with UI. Dhillon et al. [11], in their study on menopausal women living in Kelantan, used both an English and/or Malay version of a validated and reliability tested semi-structured questionnaire designed specifically for postmenopausal women living in Kelantan to document the postmenopausal complaints, including UI. Zalina et al. [10] had applied a standardized questionnaire to a cohort of medical and nursing student population in Ipoh, Perak, but unlike Low et al. [12], they had used the International Consultation on Incontinence Questionnaire (ICIQ)-FLUTS instead. Similarly, Ahmad, Aznal and Tham [16] in a study of women in the state of Negeri Sembilan in Malaysia, had used a Malay language self-administrated OAB screener questionnaire adapted from the ICIQ. All of these have provided very widely variable levels of prevalence of UI in Malaysia. Although the studies were conducted in different parts of the country, it cannot however, explain the wide-ranging prevalence rates reported. Given the widely different questionnaires that were used, albeit a lot of them were verified, the wide variation in their findings suggests that a more standardized tool is required for the assessment of the prevalence of UI in Malaysian women.

Risk factors associated with urinary incontinence

With regard to the identification of risk factors associated with UI in the Malaysian population, there were hardly any studies that had examined this comprehensively. UI has been associated with a number of risk factors although their exact role remains to be clearly established [34-37]. The prevalence increases at around the age of 50 years [33,38-40], especially around the age of menopause [36,41,42]. It then appears to remain stable until the age of 65 years [35,43], after which it starts to increase [43-46]. Differences in ethnicity have also been associated with types of UI. Caucasian women are reported to suffer more of SUI compared to women of African American and Asian descent. Asian women are reported to suffer more from MUI [23-38]. Previous gynecological operations, abdominal hysterectomy, surgical menopause [45-47] or urologic surgery [36,44] have all been linked as risk factors to UI. Obesity [43,47,48], increased body mass index (BMI) and weight gain [49] have also been identified as potential risk factors. Each 5-unit increase in BMI increases the risk of UI by 60% [50,51]. Co-morbidities, type 2 diabetes [52,53], cough in chronic obstructive pulmonary disease (COPD), frequent urinary tract

infections [35], history of arthritis and chronic constipation [53-57] are known to increase the risk of developing UI. Women suffering from type 2 diabetes for at least a year or more are prone to develop UI [52,58]. Furthermore, older women who have developed minimal urine leak (MUL) in the past year are more likely to progress to frequent urinary leakage over a 3-year period [58,59]. A lot of studies have suggested a significant association between UI, obstetric history [36,41] and mode of child delivery, particularly vaginal delivery in younger women [60-65]. Some have suggested that the primary cause of UI is related to parity [55] and fetal weight [63], pregnancy, and childbirth, regardless of route [66,67]. However, there are also studies that have failed to show any significant association between UI and the mode of delivery [68] or even the number of deliveries [69-71].

In addition to these risk factors, some child-bearing and older women from all ethnicities also suffer simultaneously from bladder, uterine and/or rectal prolapse [72,73], collectively known as pelvic floor disorders (PFD). The term PFD is used to define a displacement or malfunction of one or more pelvic organs. When these anatomical structures and its network of muscles, ligaments, and other tissues that hold up the pelvic organs, are no longer functioning adequately, UI (involuntary loss of urine), fecal incontinence (involuntary loss of feces), constipation, rectal pain, vaginal and/or rectal prolapse, pelvic pain/trauma, and sexual dysfunction results [27]. Pelvic floor distress symptoms in women are now increasingly recognized as an insidious health problem. It is usually under diagnosed and results in decreased QOL [66].

Heredity is another risk factor for pelvic organ prolapse (POP) and its impact on UI has not been well investigated. In the Women's Health Initiative, almost one fifth of nulliparous women had some degree of prolapse [72,73]. Family history appears to be a risk factor for pelvic disorders [60,74,75]. A differential gene expression for the structural proteins in the pubococcygeus muscle in a small-scale study involving five women with prolapse and five controls has been reported, and these differences might result from either genetic mutation or genetic inheritance [76]. An American study has also provided evidence for predisposition genes on chromosome 9q21 in some families with pelvic organ prolapse but this finding awaits further confirmation [77,78].

In the older age group, some investigators had postulated that multiple factors, especially those seen during climacteric, such as menopausal status [44,9,79] and postmenopausal hormone use [55,56,61] may account for the etiology of UI in some of the postmenopausal women. Increased risk of incontinence and worsening of existing incontinence was reported in randomized controlled trials with daily postmenopausal hormone therapy in the HERS study [47,58,61]. Younger women taking oral contraception [45] had also complained of UI indicating that estrogen and progesterone contained in the preparation may also be associated factors in UI. Low educational level, low family income [40], laboring occupation and occupational lifting [36] have also been mentioned as possible risk factors contributing to UI.

In terms of mobility impairment, women needing assistance to walk, or have immobility or reduced walking speed are all susceptible to suffer from UI [38,58]. The prevalence of risk factors and their impact on female UI however, is still not well documented in Malaysian women. Such documentation is necessary if we wish to effectively prevent or manage this health-related problem. There appears a clear need for the use of a standardized questionnaire using standardized widely accepted terminologies and proper study designs

if we are to get a better measure of symptoms in women with pelvic floor distress and UI. The Pelvic Floor Distress inventory-20 (PFDI) [78-80] is a reliable validated condition-specific QOL instrument.

Although UI is often associated with significant physical morbidity, loss of independence, decreased QOL and decreased participation in social and domestic activities [44,62,78], very little is however known about changes in its severity over time, including remission or improvement of symptoms, especially in younger and middle-aged women. This information is of great importance for the management of UI in general. Without appropriate treatment or management, UI may lead to serious psychological and social complications such as depression, anxiety, embarrassment and low self-esteem in these women [64]. There is little information on the risk factors contributing to UI in the Malaysian women. Further studies are necessary to document the prevalence of UI, together with the identification of the potential risk factors, or exacerbating factors in Malaysian women. Health related quality of life (HRQOL) represents the patient's evaluation of the impact of a health condition (menopausal symptoms) and its treatment on daily life.

Some earlier studies have reported that there might be ethnic differences in women reporting their urinary symptoms and the type of UI they are inflicted with [3,21-23]. Little has been explored on this in the multi-racial Malaysian population. Additional risk factors predisposing women to UI have been noted in recent studies. Overweight or obesity and sedentary lifestyle have been associated with UI but very few studies have been conducted in Malaysian women to confirm the association of these risk factors with UI. A difference in treatment seeking behavior has also been reported between women from developing and developed countries as well as women from high and low income category. But this has not been explored in greater detail in Malaysian women. Cross-cultural differences in the attitude and perception by women with UI exist but no phenomenology study has been undertaken in Malaysian women.

Health-related Quality of Life (HRQOL) of women with incontinence

The PRO Harmonization Group definition of HRQOL was used as a reference point in the study of Zollner et al. [80], reviewing various questionnaires used to assess HRQOL during and after menopause. HRQOL represents the patient's evaluation of the impact of a health condition and its treatment on daily life. The perception that it is "normal" for women to have incontinence [41,63,81] and that the condition is perceived by the public as more of a women's health problem than men's needs to be explored particularly among Malaysian women as it could influence the approach to its prevention and management. Another common view shared by both public and health workers is that UI is associated with ageing, which may prevent its early recognition and therefore its early management or may prevent many younger women with UI from seeking help [52,82] It has been reported that female UI, urgency and frequency significantly impair the QOL of both young and older women and also has negative effect on the partner's relationship [2,83]. The impact of UI on a woman's own emotional health is increasingly apparent. There are many studies showing the association between involuntary urine loss and indicators of psychological distress or subjective burden [2,84-89]. The effect of UI on the emotional health of partners and family and spousal caregivers in particular has been relatively neglected. It would be interesting to examine the psychosocial impact on the onset of

spouse's incontinence and also to look at the relationship between UI and marital disharmony or divorce.

Among adult patients, discussions about UI are usually avoided because they evoke feelings of embarrassment, fear, shame, and the loss of independence [72]. UI has been associated with falls, functional decline, nursing home admissions, social isolation, and depressive symptoms [7,27]. Patients are not always comfortable talking about the subject with their doctors, so it can be a challenge for clinicians to inform the afflicted woman about the condition and her treatment options. Another perspective predominantly observed in women living in countries like Malaysia, Pakistan and Indonesia is that UI is equated with uncleanness or poor hygiene [90]. Efforts are often made to conceal it. There is a huge barrier of denial and concealment that must be overcome through health awareness before QOL can be improved. Similarly, pelvic floor distress (PFD) symptoms are often recognized as a complaint that can significantly impact the well-being and QOL of women. In addition to the negative impact of PFD on the QOL of women, there is now a growing belief that complaints associated with PFD appear a lot earlier in life than previously thought and progressively worsen with age in some women [37]. In order to better understand and manage this complaint, the Psychological General Wellbeing Index (PGWBI) was used in an Australian study [89]. It covers five domains namely depression, anxiety, tension/stress, health and general wellbeing. Women with UI had a lower total PGWBI score than did women with no UI. The total PGWBI mean score was significantly lower in women with SUI and MUI compared with no UI. No significant difference was observed in the mean total scores between women with UUI and women without UI. SUI was negatively associated with PBWBI subdomains of self-control, general health and vitality whereas those with MUI had lower scores with all the subdomains. Their study concluded that the community-dwelling women with UI have significantly reduced well-being but also the relationship between different types of UI and well-being appears to differ.

Treatment-seeking behavior

There is little doubt that UI is a problem that often goes unreported by the majority of adults who are anxious to conceal the problem or are reluctant to discuss it [63,68]. Many therefore shy away from seeking treatment and only a low percentage of patients seek help for their problem. Of those who did not seek medical treatment, majority revealed that the major reason was a lack of understanding of urinary symptoms and the availability of effective treatment [13]. In addition, the factors that resulted in treatment seeking behavior by patients with FLUTS were not the same as those with risk factors for FLUTS. There is, therefore, a need for a systematic and effective dissemination of information regarding FLUTS through a properly structured healthcare system targeted at groups at risk.

Although the psychosocial and socioeconomic burden of PFD remains poorly estimated, recent reports, albeit preliminary, nevertheless suggest that these complaints are associated with significant direct and indirect financial costs arising from both the loss of output and treatment of these complaints [20,68,77]. With increasing life-span, which now stands at over 81 years for women in some developed nations, this burden has certainly increased with time as the number of women in a given population increases. In addition to that, treatment-seeking women do report that PFDs seriously disrupt their lives [63]. Complaints associated with PFDs, particularly UI, therefore can no longer be placed as affecting a small minority but

are complaints that affect a significant fraction of the population, albeit the precise prevalence remains to be clearly established.

Conclusions

In conclusion, a review of the literature on the studies on UI in Malaysian women reveals wide ranging prevalence rates. The reason/s for this is not immediately apparent but it might be due to the study design, the type of questionnaires used, the terminologies and definitions used, and the population group under study. There is little that has been examined on the risk factors, treatment-seeking behavior or the impact of UI on the QOL. Appropriate study design with the use of correct terminologies is paramount, particularly the sampling strategies as it also influences the estimates of UI. The location of the research needs to be based upon non-UI-focused surveys among the representative participants. There is a vital need for a national population based study using a validated standardized symptom-based questionnaire in appropriate languages to document accurately the prevalence, current risk factors, QOL and treatment seeking behavior associated with urinary symptoms including UI, urgency and frequency in Malaysia. In view of the magnitude of the health problem, it is imperative that more attention is paid to early intervention (primary intervention) as this might help to alleviate the complaints, or reduce suffering and burden of UI as well as reduce its impact on the QOL. Finally, QUID has used the terminology from the International Continence Society 2002 guidelines and was recognized as a standardized instrument. It was used in an Australian study [20], and Dhillon et al. [89] has translated the English language QUID to the Malay language to document the validity and reliability of this instrument in the Malaysian population. This pilot study [86] had further confirmed that the prevalence of UI is higher in Malaysian women than that reported by previous local studies and SUI was more prevalent than UUI. Studies are currently underway using QUID to estimate the prevalence and risk factors of UI in the Malaysian women living in Selangor.

Declaration

Ethics Approval

Ethics approval was obtained from the Medical Research and Ethics Committee, Ministry of Health Malaysia (Project no. NMRR-11-149-8830). Monash University Human Research Ethics Committee Certificate of Approval was obtained from August 2011-2016 (Project no.CF10/1725-2010000963). During recruitment written informed consent was obtained from all participants who met the inclusion criteria.

Competing interests

The authors declare that they have no competing interests.

Authors' contribution

HKD had made substantial contributions towards literature review and drafting of the manuscript, HJS, QKF and GK revising it critically for important intellectual content. AZMZ and RBN had thoroughly commented on the final draft and given final approval of the version to be published.

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Availability of Data and Materials

The data and material are the intellectual property of Monash University Malaysia.

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