

The Prevalence of Urinary Incontinence and Overactive Bladder among Iranian Women: A Systematic Review and Meta-Analysis

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ABSTRACT

Purpose: Urinary incontinence (UI) is characterized by any involuntary loss of urine, which can result in significant hygiene, emotional, and social challenges for individuals. This review and meta-analysis aimed to update the current understanding of the prevalence of UI and overactive bladder(OAB) among Iranian women.

Materials and Methods: We conducted an electronic search of databases included PubMed, Embase, Scopus, Web of Science, Google Scholar, Medline, Cochrane, CINAHL, and Biosis from January 1990 to february 2026. We targeted women aged 15 years and over who are living in Iran and used a set of keywords, including UI, Stress Urinary Incontinence , Urge Urinary Incontinence , Mixed Urinary Incontinence , OAB, epidemiology, prevalence, frequency, women, and Iran. A total of 23 cross-sectional studies were included in the review, with 22 articles, encompassing

27,690 participants. The quality of the studies was assessed using “Methodological guidance for systematic reviews of observational epidemiological studies reporting prevalence and cumulative incidence data from the Joanna Briggs Institute.” The I^2 index was used to estimate quantitative heterogeneity. Since the results showed high heterogeneity, the random-effects model was used. We used Egger’s test to evaluate the publication bias of the selected studies. Data analysis was performed using the statistical software of MedCalc.

Results: This study estimated the overall prevalence of UI to be 39.98% (95% CI: 30.54–49.82). The most prevalent subtype was SUI, affecting 26.88% (95% CI: 20.00–34.37) of women. OAB and UUI affected 20.13% (95% CI: 15.70–24.95) and 17.09% (95% CI: 9.38–26.55) of women, respectively. Furthermore, MUI followed, with a prevalence of 14.99% (95% CI: 6.62–25.98).

Conclusion: Considering the relatively high prevalence of UI and OAB among Iranian women, further research is needed to explore the underlying factors and to develop effective prevention, management, and treatment strategies in society. A clearer understanding of the epidemiology of UI and OAB can support the health policy planning and development of responsive healthcare services.

Keywords: Urinary Incontinence, Overactive Bladder, Epidemiology, women, Iran, Systematic review and Meta-analysis.

1. INTRODUCTION

Urinary incontinence (UI), defined as the complaint of any involuntary leakage of urine [1], is one of the most common chronic health problems. It is mostly common in women of all ages and can negatively impact their quality of life by disrupting daily activities, psychosocial and sexual health, and emotional well-being [2-4]. Moreover, it can cause a financial burden on the health care system [1]. According to the International Continence Society (ICS), UI is classified into three main types. Stress Urinary Incontinence (SUI) is defined as the involuntary leakage of urine during physical activities that increase intra-abdominal pressure (coughing, sneezing, laughing, exercise). Urge Urinary Incontinence (UUI) involves involuntary leakage of urine associated with a strong, sudden urge to urinate. Mixed Urinary Incontinence (MUI) refers to a combination of SUI and UUI [1-3]. Additionally, the ICS defines OAB as a subset of lower urinary tract symptoms (LUTS), characterized by the presence of urgency, with or without UUI, typically accompanied by frequency and nocturia [1]. UI is a multifactorial condition influenced by factors such as aging, obesity, smoking, chronic illnesses, pelvic surgery, and gender, with women being more susceptible [5-8]. In women, pregnancy, childbirth, and menopause are key risk factors, with

postpartum UI affecting 3–40% of women within the first three months after delivery. The risk is influenced by delivery type, number of births, and previous UI history [9-13]. The previous systematic review and meta-analysis indicated a broad range of UI prevalence among women, varying from 12% to 57% across different world regions [14, 15]. A systematic review and meta-analysis report the total prevalence of 25.7% in developing countries [16]. In Asian countries, 26.4% of women from China, Taiwan, and South Korea reported UI symptoms, with MUI being the most common type [17]. In India and Pakistan, the reported prevalence of UI was 21.8% and 11.5%, respectively, with SUI being the most common type [18, 19]. The prevalence of UI in Iran is estimated based on several hospital-based and a limited number of population-based studies conducted throughout the country [20-37]. While the prevalence of UI was 39.5% among postmenopausal women in Tabriz [29], it rose to 62.2% among women over 60 years old in Yazd [30]. UI prevalence was estimated at 63% in Kerman, with a higher rate among the elderly (79%) compared to younger individuals (41%) [20]. According to a systematic review published in 2019 (in Persian), the overall prevalence of UI among Iranian women was 46%, with SUI accounting for 34%, UUI for 19%, and MUI for 24% [38]. In a study conducted across five low- and middle-income countries, SUI was identified as the most common type of UI among Iranian women at 38.7%, followed by UUI at 32.1% and MUI at 21.1% [39]. However, this study included participants of both genders; all 883 participants from Iran were women.

Global prevalence of OAB was estimated at approximately 20%. Limited studies have reported the prevalence of OAB among Iranian women to range between 18.2% and 23.3% [21, 40-42]. Differences in prevalence rates may be influenced by various factors, including the geographical region, the study design, the definitions of UI used, and the assessment methods used [16, 38, 39]. Although UI and OAB prevalence have been studied in various regions of the country, there

remains limited information regarding the overall prevalence of UI in the Iranian female population. To develop comprehensive programs for the prevention and treatment of UI, the healthcare system requires updated data on this condition. Therefore, this study aimed to review the prevalence of UI and OAB among Iranian women aged 15 years and over, based on a systematic review and meta-analysis.

2. MATERIALS AND METHODS

2.1 Search terms and strategy

The search strategy and all subsequent procedures in this review were conducted following the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) statement [43]. We conducted a systematic electronic search of English and Persian language databases related to urinary incontinence from January 1990 to March 2025. The databases included are PubMed, Embase, Scopus, Web of Science, Google Scholar, Medline, Cochrane, CINAHL, and Biosis. We utilized the following MeSH terms: urinary incontinence, stress urinary incontinence, urge urinary incontinence, mixed urinary incontinence, overactive bladder, epidemiology, prevalence, frequency, women, and Iran.

2.2 Eligibility criteria

The searches were limited to Iranian women aged 15 years and over. Full-text cross-sectional, prospective and cohort articles in both English and Persian languages were included in the study.

All titles and abstracts were reviewed by two authors (NS and FD). Full texts were obtained for studies that appeared to be relevant. Following the keyword search, we carried out a background search by reviewing the reference lists of all articles obtained. The exclusion criteria included lack of access to the full text of the article, irrelevant or incomplete data, and duplication.

2.3 Screening and data extraction

After collecting the studies, two authors performed a full-text review to extract the required information. This data included the surname of the first author, the year of publication of the article, the city of research, the number of samples, the average age of participants, and the overall prevalence of OAB , UI and each of its subtypes.

2.4 Quality Assessment and Risk of Bias

Two reviewers independently evaluated the quality of the studies using the Methodological Guidance for Systematic Reviews of Observational Epidemiological Studies Reporting Prevalence and Cumulative Incidence Data from the Joanna Briggs Institute . This checklist consisted of nine questions, which covered aspects such as the appropriateness of the sample frame for the target population, sample collection method, sample size, participant characteristics, study location, sample and subgroup analysis, research tools used, research conditions, accuracy of statistical analyses, and the overall adequacy of the article. The selected studies were divided into three qualitative groups based on the score obtained for each study(41-45).

To assess the publication bias of the selected studies, Egger's test was used through statistical analysis. Findings were presented narratively, including tables and graphs.

2.5 Statistical analysis

The heterogeneity was analyzed statistically using the standard χ^2 test with a significance level of less than 0.1. We used the I^2 index to estimate quantitative heterogeneity, with results showing significant heterogeneity (greater than 50%) between studies. based on the findings of heterogeneity tests, Random-effects meta-analysis was performed and between study variance (τ^2) was estimated using the DerSimonian-Laird method implemented in MedCalc software (version 22.009). To address the non-normal distribution of the untransformed proportion, the Freeman-Tukey double arcsine transformation was applied prior to pooling, and the pooled estimates were subsequently back-transformed to the original proportion scale for interpretation.

3. RESULTS

3.1 Study characteristics

First, sixty articles were selected through electronic searching as well as, eight more articles were added by reviewing their references and bibliographies. In these sixty-eight articles, twelve were duplicates, and thirty-three did not meet the inclusion criteria. Reviewing the full texts of the remaining articles revealed 23 articles about the UI prevalence or one of its subgroups. Of these, one article did not include sufficient information for meta-analysis. Finally, 22 articles met the inclusion criteria, and were selected for quantitative synthesis (meta-analysis) to estimate the prevalence of UI. The PRISMA diagram (Figure 1) provides an overview of the search results and the selection of included articles. Descriptive findings of the twenty-three reviewed articles are shown in Table 1. Six studies were done in Tehran [22, 23, 25, 26, 44, 45], five in Tabriz [13, 27-29, 46], one in Esfahan [21], one in Yazd [30], one in Dezful [31], one in Qashqai's Tribe [32], one in Rasht [47], one in Babol[33], one in Ahvaz [34], one in Birjand [35], one in South Khorasan

[36], one in Kerman [20], and the last one all over Iran [48]. In fifteen studies, data collection was done through a questionnaire [13, 20, 23, 26-31, 33, 34, 36, 37, 45-47]. A questionnaire with an interview was used in three studies [22, 24, 35]. In one study, a questionnaire and physical examination [25] and, in three studies, an interview and physical examination [32, 41, 48], and in one study only interview [37] was used, respectively. All studies included nulliparous, primiparous, and multiparous women except for two studies [23, 27] that contained only pregnant nulliparous women.

3.2 Quality assessment and risk of bias

All reviewed articles underwent methodological quality assessment (Table 2). Each question had four answer options (yes, no, unclear, and not applicable), with only 'yes' receiving a score of one, while the other options were assigned a score of zero. The scores ranged from zero (worst case) to nine (best case). Articles with a score of zero to four were categorized as low quality, five to seven as moderate, and over seven as high quality, respectively (Table 2). The quality assessment that the majority of included studies met most of the JBI criteria suggesting and overall moderate to high quality of evidence.

Based on the results of Egger's test, there was no publication bias in disseminating outcomes for any types of UI in women (Table 3). Figure 2 shows the funnel plot for publication bias.

3.3 Heterogeneity Assessment

The I^2 index was used to estimate quantitative heterogeneity, and the outcomes revealed significant heterogeneity (greater than 50%) between studies. Since an I^2 value above 50% indicates high heterogeneity, we applied the random effects model and performed subgroup analysis. The results

of the I^2 index were reported in Table 4.

3.4 Prevalence of UI

Analyses of the reviewed articles show an overall prevalence of UI estimated at 39.98% (95% CI: 30.54-49.82) (Figure 3).

Figure 4 shows the pooling of studies reporting SUI, estimating its prevalence to be 26.88% (95% CI: 20.00–34.37). The UUI prevalence was estimated to be 17.09% (95% CI: 9.38–26.55) by pooling the results of studies on UUI (Figure 5). The prevalence of MUI was estimated at 14.99% (95% CI: 6.62–25.98) (Figure 6). The OAB was estimated to have a prevalence of 20.13% (95% CI: 15.70–24.95) based on the results of three studies (Figure 7). Given the small number of included studies for OAB pooled prevalence, the standard DerSimonian–Laird random-effects model may underestimate uncertainty, leading to overly narrow confidence intervals, and alternative approaches such as the Hartung–Knapp–Sidik–Jonkman (HKSJ) and modified HKSJ methods have been recommended[49, 50] . However, we conducted a sensitivity analysis using a leave-one-out approach by sequentially excluding individual studies to assess the robustness of pooled estimates. The pooled estimates remained stable across all analyses (range: 18.90–21.89) with overlapping 95% confidence intervals, indicating that the results were not driven by any single study. Therefore, the conclusions of the meta-analysis appear robust despite the limited number of included studies.

The prevalence of UI in the third trimester of pregnancy and the postpartum period was reported as 39.4% and 31%, respectively [27]. Table 5 shows the prevalence of all types of UI in detail.

4. DISCUSSION

This meta-analysis article was conducted to review the prevalence of both UI and OAB among

Iranian women. A total of 22 articles, including 27,690 participants, were included in the study. The overall prevalence of UI and OAB was estimated at 39.98% and 20.13%, respectively. SUI was the most prevalent subtype, with a prevalence of 26.88%, followed by UUI at 17.09%, and MUI at 15%. A recent study conducted in five low- and middle-income countries found that among Iranian women, SUI was the most prevalent type at 38.7%, followed by UUI at 32.1% and MUI at 21.1% [39]. Like the present study, SUI was the most common subtype, while MUI was the least common. Although the study included both men and women overall, all 883 participants from Iran were female [39]. A systematic review and meta-analysis investigated the prevalence of female UI in the developing world, which also includes Iran [16]. The total prevalence of UI was estimated at 25.7%, and the prevalence rates for stress, urgency, and MUI were 12.6%, 5.3%, and 9.1%, respectively [16], which is significantly lower than the UI percentages obtained in the present study. The only published systematic review on Iranian women (in Persian) reported an overall prevalence of UI at 46%, with SUI accounting for 34%, UUI for 19%, and MUI for 24% [38]. However, while the overall rates of UI and their types differ somewhat from those reported in the present study, both indicate that SUI is the most common type. Batmani et al., in a meta-analysis of 29 studies involving a total sample of 518,465 individuals, reported a global prevalence of UI among women over 55 years to be 37.1% (95% CI: 29.6–45.4%) [51]. A systematic review by Almousa et al. reported a wide variation in UI prevalence among women, ranging from 1% to 42.2%, with SUI being the most common subtype, 12.5%–79% [52]. Based on Cerruto et al.'s study, the prevalence of UI in European countries ranged from 14.1% to 68.8%, which is increasing with age. Such differences in prevalence mainly depend on heterogeneity of studies and methodological variation in prevalence estimation, as well as demographic characteristics of samples. Also, the maternal age,

Body Mass Index, family history of UI, and parity are recognized as main risk factors for UI in pregnancy [53]. As an another covariate, studies found a positive association between UI and back or pelvic girdle pain for at least one type of incontinence which mainly depends on pain and incontinence subtypes[54, 55]. This point could be take into account in futre research of prevalence in Iran.

relationship in their clinical practice.

In another published article on 24 studies in the Western world, including 35,064 women, the weighted mean prevalence of UI in postpartum women was 31.0%. Although prevalence initially decreased by three months postpartum, it rose again to 32% by one year, nearing levels seen in the third trimester of pregnancy. SUI, with a rate of 54%, was the most common type [56]. More than 60% of community-dwelling adult women in the United States experience some form of UI, representing an increase from earlier estimates of 38%–49% based on data from 1999 to 2004. Over 20% report moderate to severe symptoms. Among these cases, SUI accounts for 37.5%, UUI for 22%, and MUI for 31.35%. The rising prevalence of UI may be attributed to population aging and increasing rates of obesity [57]. Based on a telephone survey of 1,000 individuals in Canada (52% women and 48% men), 34.5% of women reported experiencing urinary leakage of varying severity, compared to 12% of men. The overall distribution of UI in Canada has remained unchanged since 2004 [58]. A meta-analysis of 32 published articles in both English and Chinese languages reported a 26% prevalence of postpartum UI (95% CI: 21%–30%). Also, vaginal delivery and neonates with a weight over 4 kg are identified as significant risk factors for postpartum UI [59]. A study in Saudi Arabia found a 32.4% prevalence of UI among 516 women, with risk factors including age, marital status, BMI, childbirth, and vaginal surgery. Despite its

impact on social, household, and work activities, few women sought medical help, and over half reported no improvement after consultation [60]. A systematic review of studies from countries in the Persian Gulf region found that the prevalence of UI among women ranged from 20.3% to 54.5%, with SUI being the most reported type. Chronic respiratory conditions and constipation were identified as the primary predisposing factors [61].

UI prevalence varies widely across regions, likely due to cultural differences and varying research methods [51, 62]. It is primarily linked to anatomical, physiological, and functional changes in the pelvic floor [59, 63]. Key risk factors include age, parity, mode of delivery, menopause, limited mobility, and certain chronic conditions, particularly diabetes, which is associated with UI due to bladder neuropathy [51, 53, 64, 65]. Hysterectomy and pelvic surgeries also contribute to UI risk, while the roles of obesity and assistance or vaginal delivery remain debated [57, 66]. Musculoskeletal issues such as arthritis and varicose veins show significant associations, with possible links to joint pain, osteoporosis, and cardiovascular conditions [67]. In Iran, UI is notably common among women of reproductive age, especially those with higher parity or specific delivery modes [29]. SUI is more prevalent in younger and middle-aged women, whereas urge and mixed types are more common in older women [16, 38, 39].

In the present study, the overall prevalence of OAB was estimated at 20.13%. This aligns with findings from limited studies conducted among Iranian women, which have reported prevalence rates ranging from 18.2% to 23.3% [13, 21, 48]. A recent meta-analysis of 53 studies involving 610,438 participants estimated the global prevalence of OAB at 20% (95% CI: 18–21%), which was 21.9% in women (95% CI: 0.20–0.24) [42]. It is estimated that OAB affects between 1.4 and 2.5 million women in Canada [68]. OAB was also more prevalent among individuals who were

overweight, obese, aged 60 or older, and those living in middle-income countries compared to high-income countries [42].

Comparing findings across studies remains challenging due to the absence of standardized definitions and consistent, reproducible methods for assessing UI and OAB. Consequently, reported prevalence rates for both conditions vary depending on the definitions and diagnostic approaches used. To our knowledge, no comprehensive epidemiological study has assessed UI prevalence in the general female population of Iran; most existing studies are based in clinical settings and focus on women during their postpartum or reproductive ages. Our study assessed the prevalence of UI and OAB among all women aged 15 and older, without classification by age, postpartum status, menopausal status, or physical activity level.

In the present study, some limitations are acknowledged; Conventional funnel plots (effect estimate vs standard error) were used to assess publication bias. We note that MedCalc does not provide funnel plots of study size against log odds, which have been suggested as a more accurate approach for meta-analyses of proportions[69]. This limitation is acknowledged in the interpretation of the results. Another limitation was the inability to apply population weights for inverse probability weighting, along with limited access to unpublished data sources. Besides, the substantial heterogeneity observed across studies may be attributed to differences in study populations, age distributions, menopausal status, and assessment methods. However, formal exploration of these sources through subgroup analysis or meta-regression was limited by inconsistent reporting and methodological variability among the included studies. Prediction intervals, which may better reflect the dispersion of true effects when heterogeneity is high, could be considered when interpreting the pooled estimates. Also for future studies it is suggested to

develop a standardized protocol considering standard definitions of UI, measurement tools, and population-based studies in Iran. As a suggestion, future epidemiological studies should systematically collect and report individual-level risk factors for urinary incontinence, including parity, body mass index, and mode of delivery to enable more comprehensive evidence synthesis.

5. CONCLUSIONS

Urinary incontinence represents a significant public health burden. This study aimed to provide an updated overview of the prevalence of UI among women aged 15 years and over in the general population of Iran by reviewing existing research. The findings can inform the development of targeted healthcare programs for women with UI. A clearer understanding of the general epidemiology and associated risk factors will enable the healthcare system to deliver more effective and responsive treatment services.

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Competing interests

The authors declare that they have no conflicts of interest.

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Availability of data and material

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

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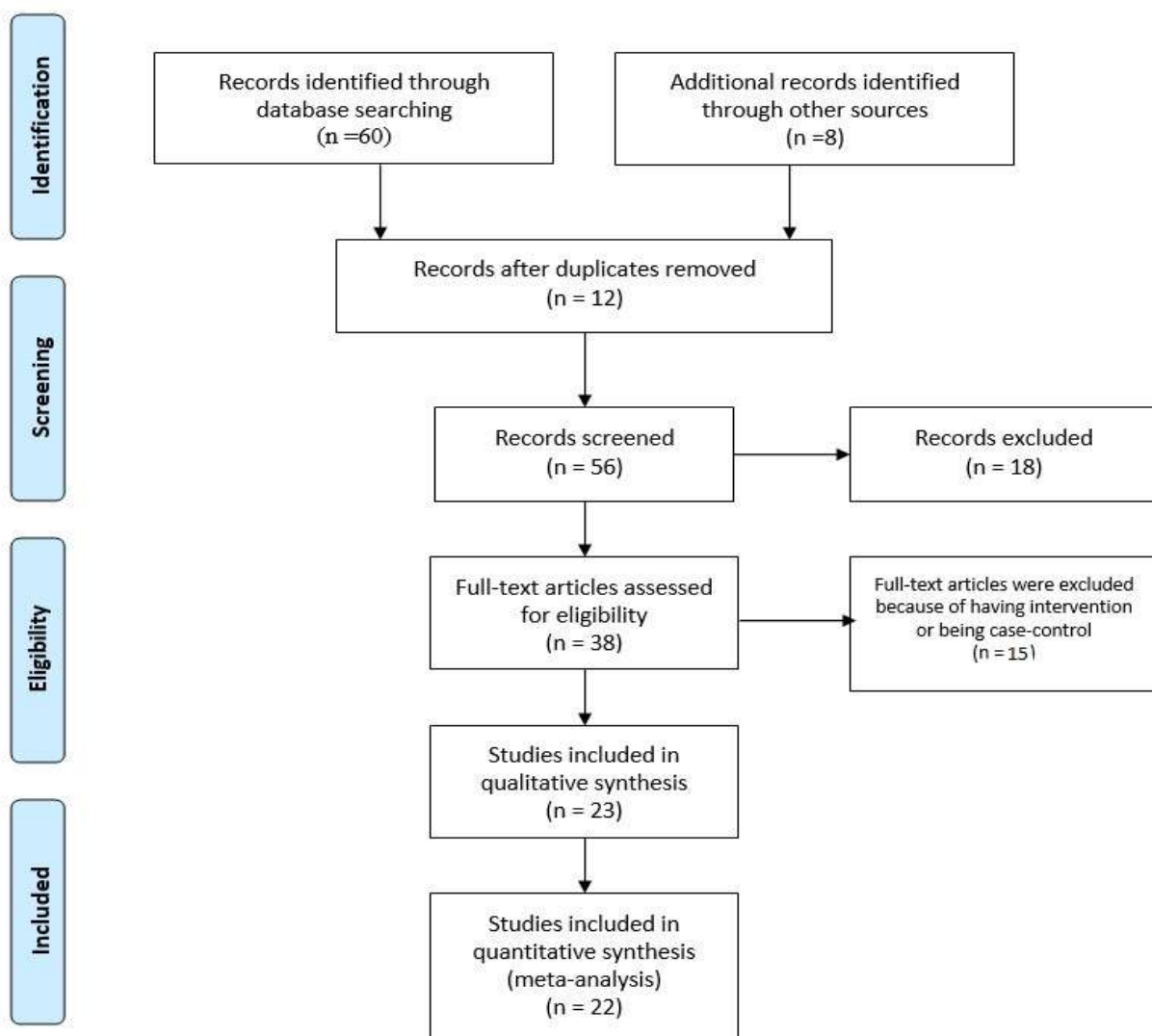


Figure. 1 PRISMA diagram outlining the literature search

Table 1. The main characteristics of studies											
Author/ year	Study region	Study design	Data collection	Sample size = n	Age	UI type	UI prevalence (%)				
							Overall	SUI	UII	MIXED	OAB
Sadeghi-Hassanabadi 1998	Qashqa’I Tribe	cross-sectional survey	Interview & vaginal examination	1010	---	Overall UI	27				
Eftekhar 2006	Tehran	prospective study	Designed questionnaire	1000 primiparas	---	postpartum SUI	14.1				
Nojomi 2008	Tehran	cross-sectional survey	interview by a structured questionnaire	411	30-70	Overall UI, SUI, UII, MUI	27	18.7	4.1	4.1	
Sobhgol 2008	Tabriz	cross-sectional survey	interview by a structured questionnaire and vaginal examination	330	15–49	SUI, UII, MUI and OAB		31.8	25.5	19.4 23.3	
Safarinejad 2009	Iranian women	cross-sectional study	Interview and physical examination	8748	15-55	OAB				18.2	
Ahmadi[70][69][68][69][69][69][68][67][66][65][64][64][64][64] 2010	Tehran	cross-sectional study	Interview and questionnaire	800	53.96±9.96	Overall UI	38.4				
Hajebrahimi 2012	Tabriz	cross-sectional study	ICIQ-UI SF	123	46/30±13/14	SUI, UII, MUI		34.1	30.9	35	
Eftekhar[71][70][69][70][70][70][70][69][68][67][66][65][65][65][65] 2012	Tehran	cross-sectional study	Questionnaire and physical examination	304	40-55	Overall UI, MUI		24		8	
Momenimovahed 2013	Tehran	cross-sectional study	Questionnaire for Urinary Incontinence Diagnose (QUID)	400	46±10.13	SUI, UII, MUI		55.8	24.2	20	
Mallah	Tabriz	cohort study	designed	441	28.1±	Overall UI	39.4% in the				

2014			questionnaire	nulliparous	3.7		third trimester of pregnancy. 31% in the postpartum period				
Pakgohar 2014	Rasht	cross-sectional study	Questionnaire for Urinary Incontinence Diagnose (QUID)	313 postmenopausal women	52.9±3.68 years (45–60)	SUI, UI, MUI	24.3	27.2	48.6		
Vasaghi-Gharamaleki 2015	Tehran	cross-sectional study	self-report questionnaire	195 athletes' women	24.18±8.70	SUI	10.77				
Morowatisharifabad 2015	yazd	cross-sectional study	ICIQ-SF questionnaire	127	≥ 60	Overall UI, SUI, UI, MUI	62.2	39.4	5.5	3.1	
Barat 2015	Babol	cross-sectional study	Interview	750	48.24±9.95	SUI, UI, MUI	26.67	45	22.5	32	
Komeilifar 2017	Dezful	cross-sectional study	ICIQ-SF questionnaires.	2000	33.6±8	Overall UI, SUI, UI, MUI	57.7	38.2	16.9	44.9	
Moudi 2017	Babol	cross-sectional study	urinary incontinence questionnaire	590	≥60 (68.2 ± 6.8)	Overall UI	32.9				
Javadifar 2018	Ahvaz	cross-sectional study	ICIQ-SF questionnaires.	2000	33.6±8.75	Overall UI	57.7				
Zargham 2020	Isfahan	cross-sectional study	ICIQ-FLUTS	2609	40.5 ± 12.24	SUI, UI, OAB	44.5	36.3		21.69	
Hakimi 2020	Tabriz	cross-sectional study	Pelvic Floor Distress Inventory-20	340 menopausal women	54.3 ± 4.0	SUI and UI	50.9	49.8			
Daneshpajooh 2021	kerman	cross-sectional study	urinary incontinence questionnaire	3100	15-80 (46)	Overall UI	63				
Zare-Bidaki 2021	Birjand	cross-sectional study	researcher-made questionnaire	3028	32.70±11.49	Overall UI, SUI, UI, MUI	27.3	18.1	3.4	5.9	

			and interview							
Najafi 2022	Tabas, South Khorasa n	cross-sectional study	ICIQ-UI SF questionnaires	369	≥ 60 (70.86 ± 8.27)	Overall UI, SUI, UII, MUI	24.9	10	8.1	3
Alizadeh 2023	Tabriz	cross-sectional study	ICIQ-UI SF, Questionnaire for urinary incontinence diagnosis (QUID)	433 postmeno pausal women	54.5 $\pm$ 2.2	Overall UI, SUI, UII, MUI	39.5	20.6	10.4	8.5

Table 2. Quality scoring results with the JBI Critical Appraisal Checklist for Studies Reporting Prevalence Data consisting of nine questions (Q1-Q9, see Supporting Information Appendix 2). The questions with answer “yes” are shown with green circle, with answers “no” as red circle, and answer “unclear” as orange circle.

	Authors	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Quality
1	Sadeghi-Hassanabadi (1998)	●	●	●	●	●	●	●	●	●	High
2	Eftekhar (2006)	●	●	●	●	●	●	●	●	●	High
3	Nojomi (2008)	●	●	●	●	●	●	●	●	●	Moderate
4	Sobhgol (2008)	●	●	●	●	●	●	●	●	●	High
5	Safarinejad (2009)	●	●	●	●	●	●	●	●	●	High
6	Ahmadi (2010)	●	●	●	●	●	●	●	●	●	Moderate
7	Hajebrahimi (2012)	●	●	●	●	●	●	●	●	●	High
8	Eftekhar (2012)	●	●	●	●	●	●	●	●	●	Moderate
9	Momenimovahed (2013)	●	●	●	●	●	●	●	●	●	High
10	Mallah (2014)	●	●	●	●	●	●	●	●	●	Moderate
11	Pakgozar (2014)	●	●	●	●	●	●	●	●	●	High
12	Vasaghi-Gharamaleki (2015)	●	●	●	●	●	●	●	●	●	Moderate
13	Morowatisharifabad (2015)	●	●	●	●	●	●	●	●	●	Moderate
14	Barat (2015)	●	●	●	●	●	●	●	●	●	High
15	Komeilifar (2017)	●	●	●	●	●	●	●	●	●	High
16	Moudi (2017)	●	●	●	●	●	●	●	●	●	Moderate
17	Javadifar (2018)	●	●	●	●	●	●	●	●	●	High
18	Zargham (2020)	●	●	●	●	●	●	●	●	●	High
19	Hakimi (2020)	●	●	●	●	●	●	●	●	●	High
20	Daneshpajoo (2021)	●	●	●	●	●	●	●	●	●	High
21	Zare-Bidaki (2021)	●	●	●	●	●	●	●	●	●	High
22	Najafi (2022)	●	●	●	●	●	●	●	●	●	High
23	Alizadeh (2023)	●	●	●	●	●	●	●	●	●	High

Table 3. Publication bias results

Type of UI	Egger's test p-value
Overall UI	P = 0.28
SUI	P = 0.71
UUI	P = 0.74
MUI	P = 0.92
OAB	P = 0.43

1

Table 4. Heterogeneity test results

Type of UI	I ² (inconsistency)	P value	95% confidence interval
Overall UI	99.28%	P<0.001	99.13-99.41
SUI	98.74%	P<0.001	98.47-98.97
UUI	99.28%	P<0.001	99.13-99.40
MUI	99.32%	P<0.001	99.18-99.43
OAB	95.54%	P<0.001	90.19-97.97

2

3

Table 5. Prevalence of all types of incontinence

Type of incontinence	Prevalence (%)	95% confidence interval	
		Lower limit	Upper limit
Overall UI	39.98	30.54	49.82
SUI	26.88	20.007	34.37
UUI	17.09	9.38	26.55
MUI	14.99	6.62	25.98
OAB	20.13	15.70	24.95

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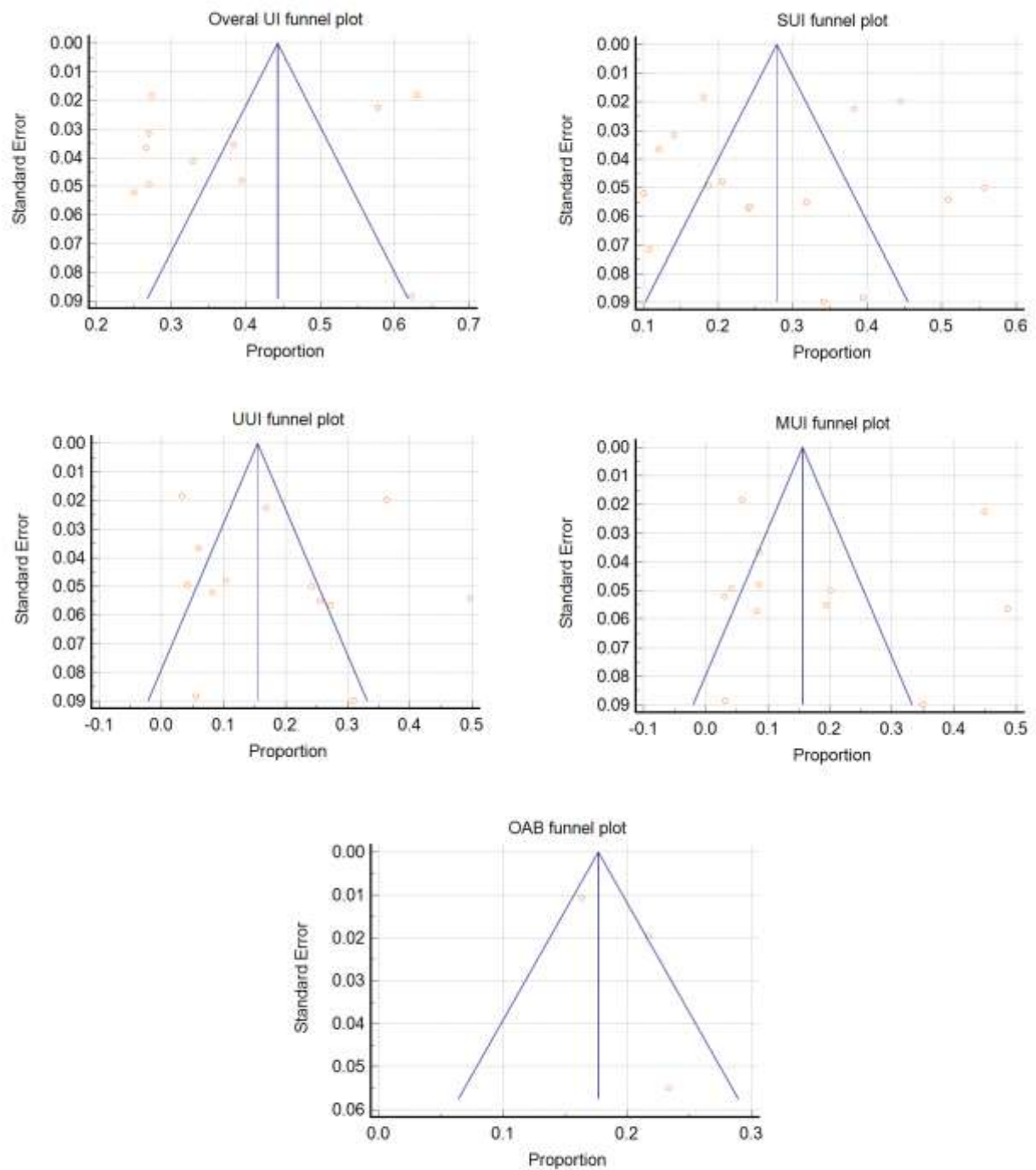


Figure 2. Funnel plots of publication bias assessment

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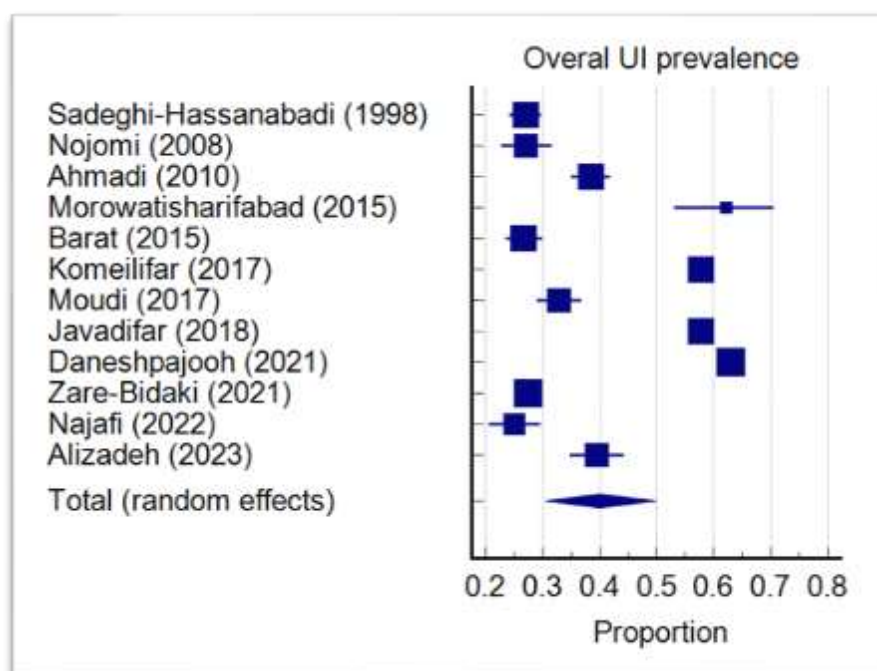


Figure 3. Overall UI Prevalence.

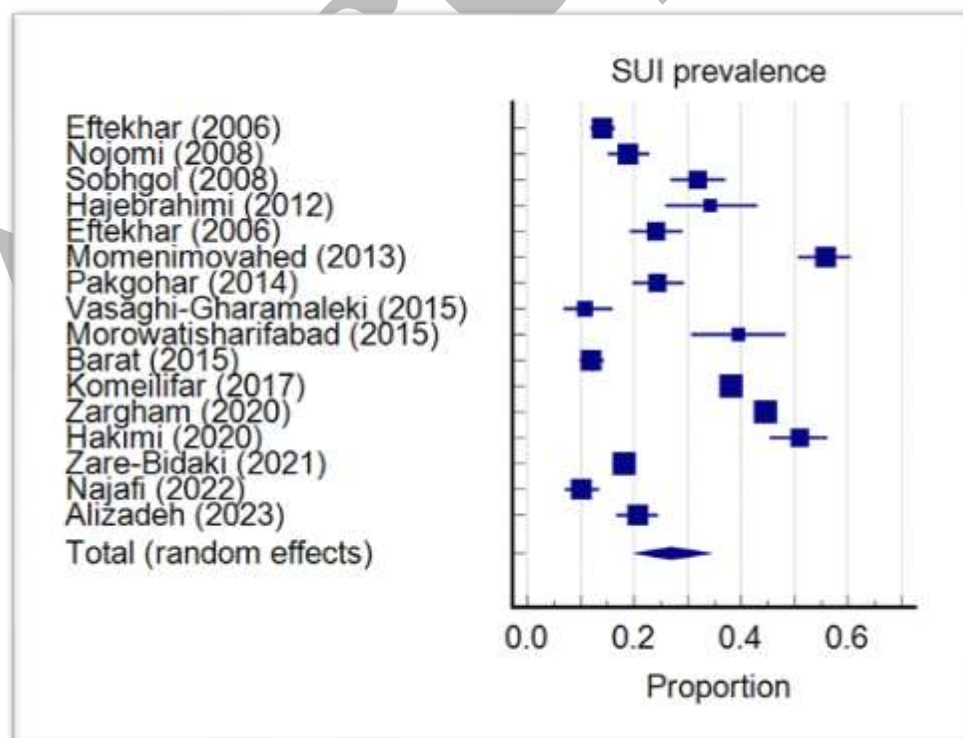


Figure 4. SUI Prevalence.

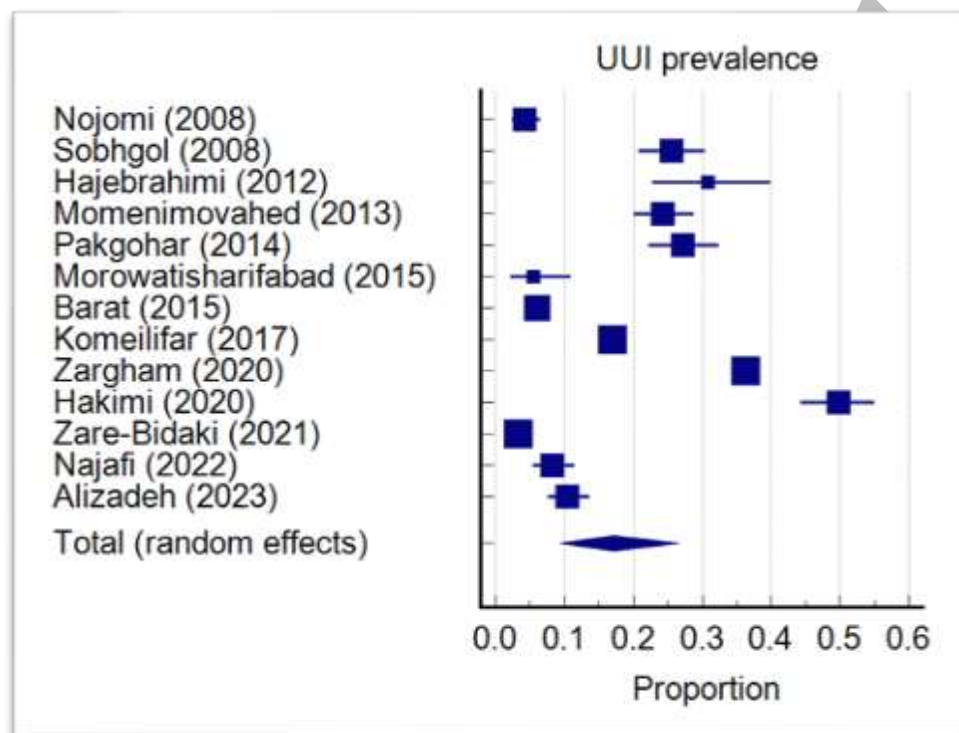


Figure 5. UUI Prevalence.

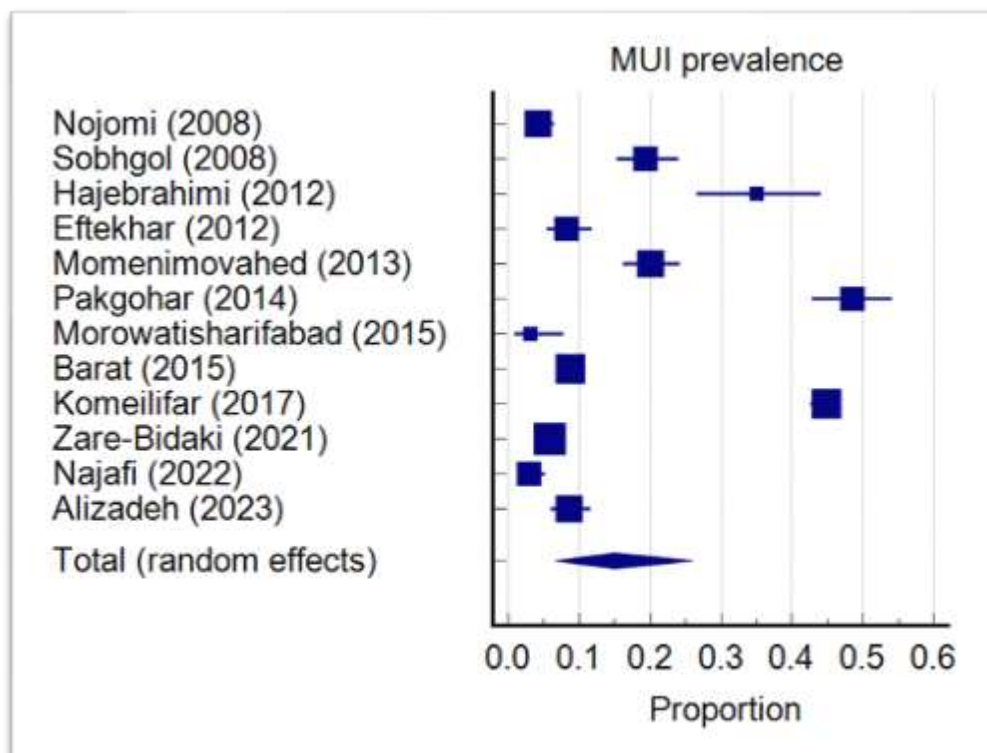


Figure 6. MUI Prevalence.

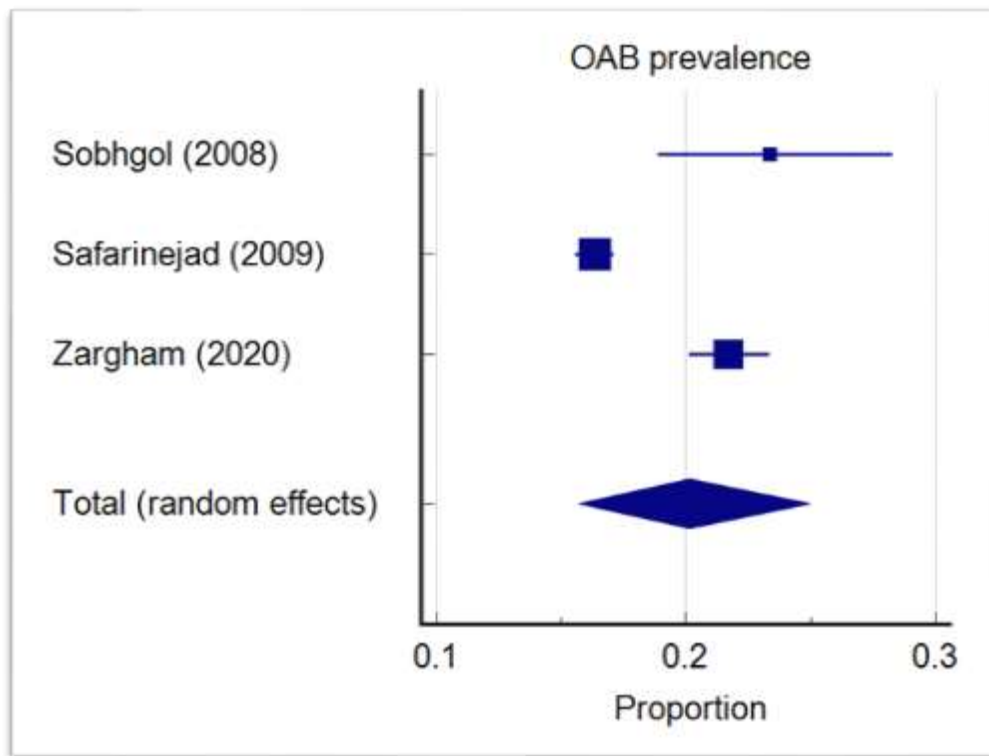


Figure 7. OAB Prevalence.