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ORIGINAL ARTICLE

Health-related quality of life in parous women with pelvic organ prolapse and/or urinary incontinence in Bangladesh

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Abstract

Introduction and hypothesis We assessed the association of pelvic organ prolapse (POP) and urinary incontinence (UI), alone and in combination (POP-UI), and related factors with health-related quality of life (HRQOL) in parous women in Bangladesh.

Methods The study included 357 parous women: 107 with POP alone, 124 with POP-UI, and 126 with UI alone. Data were collected on sociodemographic characteristics, comorbidities, symptom duration, UI severity and type, POP stage, and the 12-item Short-Form Health Survey (SF-12).

Results The median scores of the SF-12 Physical and Mental Component Summary (PCS and MCS) were 29.1 and 35.7 for POP alone, 28.0 and 35.1 for POP-UI, and 33.9 and 42.0 for UI alone, and there were significant differences among the three groups ($p < 0.001$). Participants with mixed UI had lower scores on both components than those with stress or urgency UI. UI severity was associated with lower MCS scores, but not with POP stage. Multiple regression analysis showed that the coexistence of POP and UI was associated with significantly worse PCS scores than UI or POP alone and worse MCS scores than UI alone. Age ≥ 46 years was associated with lower PCS scores, and not completing primary school was associated with lower MCS scores.

Conclusion POP and UI were associated with HRQOL, especially in those who had POP-UI, were older, and had a low educational level, mixed UI, and severe UI. Healthcare providers should understand the significance of these illnesses and address them to improve women's HRQOL.

Keywords Pelvic organ prolapse · Urinary incontinence · Quality of life · Bangladesh

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Abbreviations

POP	pelvic organ prolapse
UI	urinary incontinence
POP-UI	pelvic organ prolapse and urinary incontinence
HRQOL	health-related quality of life

Introduction

The burden of pelvic organ prolapse (POP) and urinary incontinence (UI) on women's health and their daily lives has not yet been recognized as a public health problem in many developing countries. On average, POP and UI affect 19.7% and 28.7% of women in developing countries, respectively [1]. Although they are not life-threatening diseases, they have the potential to severely affect women's health-related quality of life (HRQOL) through restrictions on physical, social, and sexual activities, psychological distress, and increased financial burden related to healthcare [1–3]. Additionally, POP and UI often coexist [4]. This may negatively impact the already

reduced HRQOL in women with one of these conditions. However, there is limited information on the impact of the combination of these illnesses on HRQOL.

The effect of illnesses on HRQOL in women in low-income countries may be more severe than in high- and middle-income countries. Women's traditionally poor position in family and society, with their value being equated with childbearing and housework, may be worsened by these illnesses, which impair their ability to perform basic activities in daily life [1, 2]. Despite their deleterious effects and available treatment options, many women do not seek care for reasons such as the perception of these illnesses as normal consequences of childbirth or part of the aging process, shyness, expenses associated with care, and so on [1–3]. In many cultures, husbands and families restrict women from seeking modern health care [1].

In Bangladesh, like other low-income countries, the impact of POP and/or UI on women's HRQOL is not well known because of the limited number of studies on the subject. One study involving 94 postpartum women found a 45.0% prevalence of UI and a significant inverse relationship between UI symptoms and HRQOL [5]. Another qualitative study revealed that women with uterine prolapse or UI experienced emotional and sexual abuse owing to the inability to do housework and satisfy their husbands' sexual demands [6].

This study aimed to assess the association of POP and UI, alone and in combination (POP-UI), and related factors with HRQOL in affected parous women in Bangladesh. HRQOL was also examined by POP stage and UI severity and type.

Materials and methods

This cross-sectional study was part of a community-based maternal morbidity research project in collaboration with a non-governmental development organization, BRAC. BRAC offers promotional, preventive, and basic curative health services to impoverished residents nationwide through community health workers and clinics. The study was conducted in the pre-urban Gazipur sub-district in Gazipur, northern Dhaka. Parous women experiencing POP symptoms were identified through household visits by 102 BRAC community health workers known as "Shasthya Kormi" (SK). The identified women were referred from the community to the BRAC clinic located at the study site between October 2015 and April 2016 for physical examination by a female obstetrician. Women diagnosed with POP at a BRAC clinic were included in this study. Pregnant women were excluded. For recruitment of women with UI, during their regular household visits in the period between August 2015 and February 2016, BRAC SK working in the study area asked resident parous women if they had any involuntary leakage. Women who responded affirmatively were included in the study. Pregnant women and those who complained of POP symptoms were excluded from the recruitment process of women with UI (to assess the HRQOL in women with pure UI without POP symptoms). Trained research assistants conducted structured questionnaire-based interviews for eligible women at the clinic or their homes.

Questions covered participants' sociodemographic characteristics such as age, educational level, marital status, employment, religion, economic status [7], and number of deliveries. Additionally, data on comorbidities and symptom duration were obtained.

The women reporting UI were further asked about the frequency and amount of leakage and UI types (stress, urge, mixed, or other). The severity of UI was assessed using the validated Sandvik Severity Index, and responses were aggregated into four frequency levels (1, less than once a month; 2, once or more per month; 3, once or more per week; 4, every day and/or night) and three levels (1, drops; 2, small amounts; 3, more) [8]. Scores were calculated by multiplying the frequency of leakage by the amount of urine lost, with total scores ranging from 1 to 12 (1 to 2: slight, 3 to 6: moderate, 8 to 9: severe, and 12: very severe) [8]. For the purpose of the analysis, "slight" and "moderate" were merged into a single category, and the same was done for "severe" and "very severe." Stress UI was defined as urine leakage caused by sneezing, coughing, exercising, lifting, or physical activities [9]. Urge UI was defined as either an urge to urinate but being unable to reach the toilet before leaking or experiencing a strong sudden urge to go to the toilet to urinate with no advance warning [9]. Mixed UI was defined as at least one stress and one urge symptom [9]. Incontinence not associated with either an activity or a sense of urgency was defined as another UI. Women with POP were also asked about the presence of UI. POP stages (0: no prolapse, 4: complete eversion) [10] were obtained from the participants' medical records.

HRQOL was assessed using the 12-item Short-Form Health Survey (SF-12) [11], a generic instrument that is widely used in many countries. The SF-12 provides a Physical Component Summary (PCS) score and a Mental Component Summary (MCS) score using eight scales: physical functioning, role limitations due to physical health, role limitations due to mental health, mental health, body pain, general health, vitality, and social functioning. Each component score has been standardized to range from 0 (worst) to 100 (best) and have a mean of 50 and a standard deviation (SD) of 10 in the general American population [11]. Scores above or below 50 can be indicated as above or below the general population norms. The mean normative scores for American women were 49.1 for PCS and 49.4 for MCS [11]. The Bengali version of the SF-12 was used in this study [12]. The questionnaire was pretested, and minor modifications were made. Cronbach's alpha was 0.68 for the PCS and 0.61 for the MCS. Ethical approval was obtained from the James P Grant School of Public Health, BRAC University, Bangladesh, and Nagasaki

University in Japan. All participants provided written informed consent before the interviews.

Statistical analysis was performed using the Stata/IC version 14.0. Descriptive statistics were calculated for sociodemographic, disease-related, and HRQOL variables. The Kruskal-Wallis test or Pearson's chi-square test was used to assess the differences in characteristics among the three groups (POP, POP-UI, and UI), and either the Mann-Whitney U test or the Kruskal-Wallis test was used to assess the relationship between sociodemographic and disease-related variables and the SF-12's two summary scores. Multiple linear regression analysis with stepwise selection was performed to identify factors independently associated with SF-12 scores. Variables with a p value < 0.25 in the univariate analysis were added to the multiple regression model. A p value < 0.05 was considered statistically significant.

Results

A total of 358 parous women participated in the study. The data analysis was conducted in 357 women after exclusion of one respondent owing to missing data on HRQOL. The participants' mean age was 46.5 years (SD = 12.3), ranging from 17 to 80 years. The total sample included 231 women with POP and 126 with UI. Of the women with POP, 124 (53.7%) had UI symptoms (POP-UI) and 107 (46.3%) did not have UI symptoms (POP). The POP, POP-UI, and UI groups significantly differed in age, educational level, marital status, economic status, number of deliveries, and symptom duration (Table 1). Women with UI were younger, married, and had a higher educational level, higher economic status, fewer number of deliveries, and shorter symptom duration than the other two groups.

Table 2 provides the POP stage and UI severity and type in the participants. Approximately half (45.0%) of the women diagnosed with POP had stage 3 prolapse and greater. There were significant differences in POP stage (≤ 2, ≥ 3) between the POP and POP-UI groups (data not shown; $p = 0.016$); women with only POP were more likely to have advanced POP. The mean UI severity score among the POP-UI and UI groups ($n = 250$) was 7.2, ranging from 1 to 12. Nearly half (51.6%) of the women with POP-UI and UI had severe and very severe UI symptoms (≥ 8), and the predominant UI types were stress (49.2%) and mixed (44.4%). There was no significant difference in UI severity (≤ 6 and ≥ 8) between the POP-UI and UI groups (data not shown; $p = 0.997$); however, there was a significant difference in UI type, indicating that those with POP-UI were more likely to have mixed UI than women with UI alone (data not shown; $p < 0.001$).

The associations between sociodemographic and disease-related variables and PCS and MCS scores are presented in Table 3. Higher scores indicate better health perception. The overall median HRQOL scores among all participants were 29.4 (mean 31.2, SD = 6.9) for PCS and 38.0 (mean 38.6, SD = 8.1) for MCS; in the POP group, they were 29.1 (mean 31.1, SD = 7.4) for PCS and 35.7 (mean 37.3, SD = 8.9) for MCS; in the POP-UI group, they were 28.0 (mean 29.0, SD = 5.8) for PCS and 35.1 (mean 35.7, SD = 7.3) for MCS; and in the UI alone group, they were 33.9 (mean 33.4, SD = 6.8) for PCS and 42.0 (mean 42.5, SD = 6.5) for MCS. There was a significant difference in PCS and MCS scores among the three disorder groups ($p < 0.001$); women with POP or POP-UI had lower scores than those with UI alone. All PCS and MCS scores shown in the table were lower than the norm in American women. Advanced age, lower educational level, being divorced/separated/widowed, experience of a higher number of deliveries, presence of comorbidities, and longer symptom duration were associated with lower PCS scores ($p < 0.05$). Advanced age, lower educational level, divorced/separated/widowed, lower economic status, experience of a higher number of deliveries, and longer symptom duration were associated with lower MCS scores ($p < 0.05$).

Table 4 presents the association of HRQOL with POP stage and UI severity and type. POP stage was not associated with HRQOL ($p = 0.235$, PCS; $p = 0.933$, MCS). Regarding UI severity, women with severe and very severe UI had lower scores on both components than those with moderate severity or less. However, only MCS scores differed significantly between the two groups ($p < 0.001$); PCS score did not ($p = 0.083$). Women with mixed UI had significantly lower scores on both components than those with stress, urge, or other UI alone ($p = 0.038$, $p < 0.001$, respectively).

Stepwise linear multiple regression showed that age $\geq$ 46 years was significantly associated with lower PCS scores ($p = 0.011$), while not completing primary school was associated with lower MCS scores ($p = 0.046$) (Table 5). Women with POP-UI had significantly lower PCS scores than those with UI by 3.58 points ($p < 0.001$) and those with POP by 2.35 points ($p = 0.006$). Regarding the association of diseases with MCS scores, women with POP-UI scored significantly lower than those with UI by 6.31 points ($p < 0.001$).

Discussion

The present study assessed the impact of POP and UI on HRQOL among parous women with these illnesses. We found that the studied women had poorer HRQOL than the norm, and the factors associated with lower HRQOL were the coexistence of POP and UI, increased age, and a low educational level. The severity of UI was also associated with HRQOL, but POP stage was not associated with it.

Overall, the mean PCS and MCS scores on the SF-12 in the studied women were lower (poorer) than the norm in American women (PCS: 31.2 in the studied population vs.

Table 1 Characteristics of the study population ($N = 357$)

Characteristic	All (N = 357) N (%)	POP ($n = 107$) n (%)	POP-UI ($n = 124$) n (%)	UI ($n = 126$) n (%)	p value
Age, years mean (SD) [range]	46.5 (12.3) [17–80]	49.9 (10.7) [25–80]	49.1 (11.4) [25–80]	41.2 (12.6) [17–80]	< 0.001[a]
≤ 45	186 (52.1)	35 (32.7)	59 (47.6)	92 (73.0)	< 0.001[b]
≥ 46	171 (47.9)	72 (67.3)	65 (52.4)	34 (27.0)	
Educational level					< 0.001[b]
None/not completed primary	273 (76.5)	94 (87.9)	104 (83.9)	75 (59.5)	
Primary school or higher	84 (23.5)	13 (12.1)	20 (16.1)	51 (40.5)	
Marital status					0.013[b]
Married	259 (73.0)	69 (63.5)	88 (71.0)	102 (81.0)	
Divorced/separated/widowed	98 (27.0)	38 (36.5)	36 (29.0)	24 (19.0)	
Employment status					0.844[b]
Employed	69 (19.3)	21 (19.6)	22 (17.7)	26 (20.6)	
Unemployed	288 (80.7)	86 (80.4)	102 (82.3)	100 (79.4)	
Religion					0.410[b]
Islam	341 (95.6)	103 (96.3)	116 (93.5)	122 (96.8)	
Hinduism	16 (4.4)	4 (3.7)	8 (6.5)	4 (3.2)	
Economic status					< 0.001[b]
Low	178 (49.9)	66 (61.7)	65 (52.4)	46 (36.8)	
High	179 (50.1)	41 (38.3)	59 (47.6)	79 (63.2)	
Number of deliveries, mean (SD) [range]	3.9 (1.9) [1–13]	4.3 (2.0) [1–11]	4.2 (1.8) [1–13]	3.2 (1.7) [1–8]	< 0.001[a]
≤ 3	171 (48.0)	44 (41.1)	43 (34.7)	84 (66.7)	< 0.001[b]
≥ 4	186 (52.0)	63 (58.9)	81(65.3)	42 (33.3)	
Comorbidity					0.604[b]
Yes	65 (18.2)	18 (16.8)	26 (21.0)	21 (16.7)	
No	292 (81.8)	89 (83.2)	98 (79.0)	105 (83.3)	
Duration of symptom, months, mean (SD) [range]	89.1 (92.4) [3–636]	105.5 (96.0) [5–480]	109.9 (99.0) [3–480]	54 (71.4) [3–636]	< 0.001[a]
≤ 84 (7 years)	231 (64.7)	61 (57.0)	66 (53.2)	104 (82.5)	< 0.001[b]
≥ 96 (8 years)	126 (35.3)	46 (43.0)	58 (46.8)	22 (17.5)	

POP pelvic organ prolapse, *UI* urinary incontinence, *SD* standard deviation

[a] Kruskal-Wallis test; [b] Pearson's chi-square test

norm of 49.1. and MCS: 38.6 vs. 49.4, respectively) [11]. When compared with patients with other chronic diseases such as hypertension, congestive heart failure, myocardial infarction, and type 2 diabetes, the participants in this study had lower scores on both components (PCS, 31.2 for studied population vs. reference of 40.0–46.5; MCS, 38.6 vs. 51.2–53.0, respectively) [11]. The low scores indicate that these illnesses were detrimental to HRQOL in the studied population. This is understandable considering the consequences of POP and UI, such as difficulty in performing housework, distress, embarrassment, and restriction of social activities [1]. There are no normative SF-12 data pertaining to the Bangladeshi general population, and it may thus be necessary to interpret the results considering cultural influences on health status perceptions when making comparisons with other countries. HRQOL in the Bangladeshi general population may already be poorer than that among Americans. For example, a community study investigating the prevalence of chronic disease and HRQOL in Bangladeshi residents aged ≥ 30 years reported that the mean SF-12 scores among participants without chronic kidney disease, who formed the reference group, were lower than the American norm (PCS, 40.2, MCS, 41.1) [13].

Participants with POP alone had decreased HRQOL, and POP was associated with physical health to a greater degree than mental health. Similarly, in a study using another common quality of life (QOL) instrument (Nottingham Health Profile), POP symptoms were significantly associated with poor QOL on all six dimensions of physical, emotional, and social distress [14]. A study by Jelovsek et al. showed that women with POP had

Table 2 POP stage and severity and type of UI of the study population

	n (%)
POP stage (*n* = 231)	
1	51 (22.1)
2	76 (32.9)
3	77 (33.3)
4	27 (11.7)
UI severity (*n* = 250)	
Mean (SD) [range]	7.2 (3.6) [1–12]
Slight (1–2)	28 (11.2)
Moderate (3–6)	93 (37.2)
Severe (8–9)	66 (26.4)
Very severe (12)	63 (25.2)
UI type (*n* = 250)	
Stress	123 (49.2)
Urgency	13 (5.2)
Mixed (co-existing stress and urgency)	111 (44.4)
Other UI	3 (1.2)

decreased SF-12 PCS scores compared with normal controls, while MCS scores were similar in both groups [15]. The physical restrictions associated with the disease, together with psychosocial and financial barriers, may be an obstacle to seeking treatment. Regarding POP stage, we found no significant association with HRQOL, indicating that the severity of prolapse did not play a direct role in the daily lives of women with POP. A previous study also showed no association between POP stage and HRQOL measured by the SF-36; however, general health was significantly worse in women with POP stage 2 than in those with more advanced POP [16]. Other studies evaluating the correlation between increasing POP stage and impairment of HRQOL using condition-specific QOL questionnaires have shown contradictory results; some studies have demonstrated a correlation [17] while others have not [18]. Thus, there is no strict correlation between the anatomical severity of POP and HRQOL. This suggests that it may be important to consider symptoms, their severity, and their impact on daily life beyond anatomical findings when assessing and providing treatment options for women with POP because the goal of treatment for POP is improvement of QOL [17].

In accordance with previous studies, our results showed that UI, regardless of its type and severity, was negatively associated with HRQOL, presenting lower scores than the norm. This indicates that involuntary urine loss is a debilitating symptom that can impair HRQOL. A case-control study reported that both the PCS and MCS scores on the SF-12 among Italian women with UI who visited a gynecology clinic were lower than those in women without UI [19]. In a study in Bangladesh in which the SF-36 was used to investigate the impact of UI on postpartum women aged 18–44 years, participants reported impaired HRQOL compared with the American norm [5].

Different UI types may exert varying levels of influence on QOL because of different pathophysiological mechanisms. Our data indicated that women with mixed UI were more likely to have worse physical and mental HRQOL than those with stress or urge UI alone. This result is consistent with a previous study showing that mixed UI had a greater impact on women's HRQOL than other types [19]. The reason for this may be that mixed UI is a combination of two conditions, the effects of which are additive [20], leading to more frequent and greater urine loss, affecting daily life more negatively than a single symptom.

UI severity is also an important factor in HRQOL in women with UI. Past studies have shown an association between symptom severity and lowering of QOL [21]. The present results confirmed that in nearly half of the women with UI, the condition was severe or very severe, and in these women, there was a greater association with MCS scores than in those affected to a less severe degree, whereas PCS scores did not significantly differ between them. A qualitative study reported that Bangladeshi women with stress incontinence experienced emotional abuse, such as being ridiculed and treated with disgust by people and sexual violence from their husbands [6]. Muslim women experience additional emotional distress because UI is a barrier to the physical cleanliness required for daily prayers [22].

Multiple regression analysis showed that POP and UI were significantly associated with HRQOL. The coexistence of POP and UI displayed a greater negative association with physical HRQOL than either UI or POP alone and with mental HRQOL than UI alone, even after adjusting for other sociodemographic and potentially confounding variables. In this study, around half of the women with POP had UI symptoms. The combination of the two conditions may lead to greater limitations in physical and social activities and psychological burden compared with the effect of a single condition, as is the case with mixed UI. Deteriorated HRQOL in women with two conditions may be attributable to the fact that women with UI alone can cope with the symptoms in their daily lives and are able to manage to a better extent than those with concomitant POP. Similar to our study, Markland et al. investigated the effects of the dual condition of urge UI and anal incontinences on HRQOL [23]. As per their results, women with dual incontinence had significantly worse SF-12 PCS scores than women with urge UI alone; however, there was no significant difference in MCS scores [23]. Additionally, studies on patients with other chronic diseases showed that dual conditions not only affect QOL but also increase medication use [24]. Healthcare providers need to understand these effects and pay special attention to women with coexisting POP and UI.

The associations between demographic variables and HRQOL in the multiple regression analysis were consistent with findings of previous studies. Old age is a predictor of worse physical health, and higher educational levels have a

Table 3 Association between studied variables and SF-12 scores ($N = 357$)[a]

Variable	N	Physical component summary		Mental component summary	
	(%)	Score	*p* value[b]	Score	*p* value[b]
Age, years			< 0.001		0.003
≤ 45	186 (52.1)	31.3 [19.5–49.6]		38.8 [17.4–62.5]	
≥ 46	171 (47.9)	28.1 [17.3–51.6]		36.8 [22.1–61.7]	
Educational level			< 0.001		< 0.001
None/not completed primary school	273 (76.5)	30.5 [17.3–51.6]		37.2 [17.4–61.6]	
Primary school or higher	84 (23.5)	33.0 [18.7–47.7]		41.5 [24.5–62.5]	
Marital status			0.031		0.046
Married	259 (73.0)	30.5 [18.8–51.6]		38.3 [17.4–62.5]	
Divorced/separated/widowed	98 (27.0)	28.4 [17.3–49.3]		36.6 [24.5–61.5]	
Employment status			0.970		0.740
Employed	69 (19.3)	31.4 [18.4–51.5]		38.0 [25.8–59.6]	
Unemployed	288 (80.7)	29.3 [17.3–51.3]		37.8 [17.4–62.4]	
Religion			0.08		0.175
Islam	341 (95.6)	29.3 [17.3–51.6]		38.0 [17.4–62.5]	
Hinduism	16 (4.4)	32.3 [25.4–47.7]		35.6 [26.1–58.4]	
Economic status			0.400		0.032
Low	178 (49.9)	29.3 [17.3–51.6]		36.5 [17.4–61.6]	
High	179 (50.1)	29.7 [19.5–49.6]		38.7 [25.0–62.4]	
No. of deliveries			0.001		< 0.001
≤ 3	171 (48.0)	31.1 [19.4–49.6]		39.2 [17.4–62.5]	
≥ 4	186 (52.0)	28.3 [17.3–51.6]		36.4 [22.1–61.6]	
Comorbidity			0.011		0.296
Yes	65 (18.2)	28.1 [17.3–48.2]		37.4 [24.9–55.4]	
No	292 (81.8)	30.2 [17.8–51.3]		37.7 [16.9–56.5]	
Duration of symptom, years			< 0.001		< 0.001
≤ 7	231 (64.7)	31.0 [17.3–51.5]		38.8 [17.4–62.5]	
≥ 8	126 (35.3)	27.7 [18.4–51.6]		27.7 [18.4–51.6]	
POP	107 (30.0)	29.1 [17.3–51.6]	<0.001c	35.7 [22.1–61.6]	< 0.001c
POP-UI	124 (34.7)	28.0 [18.4–47.7]		35.1 [17.4–58.4]	
UI	126 (35.3)	33.9 [19.5–49.6]		42.0 [27.3–62.5]	
All	357	29.4 [17.3–51.6]		38.0 [17.4–62.5]	
US women norm		49.1(9.9)[d]		49.4(9.8)[d]	

SF-12 12-item Short Form Health Survey, *POP* pelvic organ prolapse, *POP-UI* pelvic organ prolapse and urinary incontinence, *UI* urinary incontinence

[a] Median [range] unless indicated otherwise

[b] Mann-Whitney U test

[c] Kruskal-Wallis test

[d] Mean (standard deviation)

positive effect on mental health in women with POP or UI [21, 25, 26]. In general, these factors have also been reported in other health conditions [27]. It is reasonable that advancing age would restrict physical function, and a high educational level would increase access to information and resources about the disease, which would help improve HRQOL. In univariate analysis, being unmarried and having a lower economic status, a higher number of deliveries, and longer

Table 4 Association between characteristics of POP and UI and SF-12 scores[a]

Variable	*N*	Physical component summary		Mental component summary	
	(%)	Score	*p* value[b]	Score	*p* value[b]
Stage of POP (*n* = 231)			0.235		0.933
≤ 2	127 (55.0)	29.0 [18.4–51.5]		35.5 [22.1–61.6]	
≥ 3	104 (45.0)	27.9 [17.3–51.6]		35.7 [17.4–61.6]	
UI severity (*n* = 250)			0.083		0.044
Slight to moderate (1–6 points)	121 (48.4)	31.0 [18.4–49.3]		40.4 [22.6–58.4]	
Severe and very severe (8–12 points)	129 (51.6)	28.8 [18.8–49.6]		37.4 [17.4–62.5]	
Type of UI (*n* = 250)			0.038		< 0.001
Stress only or urgency only or other UI	143 (57.2)	30.6 [20.0–49.6]		41.0 [22.6–62.5]	
Mixed (co-existing stress and urgency)	107 (42.8)	28.7 [18.4–47.7]		36.1 [17.4–58.4]	

SF-12 12-item Short Form Health Survey, *POP* pelvic organ prolapse, *POP-UI* pelvic organ prolapse and urinary incontinence, *UI* urinary incontinence

[a] Median [range] unless indicated otherwise

[b] Mann-Whitney U test

symptom duration were associated with poor physical and mental HRQOL, consistent with findings of previous studies [25, 26]. These socioeconomic and cultural factors play an important role in women's health and QOL, especially in developing countries such as Bangladesh where women have low status in patriarchal societies and are socially and economically dependent on husbands [28]. Disadvantaging factors such as having no husband may worsen symptoms and their HRQOL. In addition, despite their impaired functioning as a result of the disorders, many women do not seek appropriate care because of the perception that these conditions are natural consequences of childbirth, aging, shyness, and cost, among other factors [1–3]. Thus, affected women may remain untreated for a long period of time, potentially leading to detrimental effects on their HRQOL.

This study has several limitations. The data were collected using face-to-face interviews instead of the self-administration method used in most previous studies in developed countries. This variation in the method of questionnaire administration might have led to different results. In addition, overactive bladder as a co-occurring condition with a prevalence rate of 22.1% among women aged ≥ 40 years in Asian countries [29] was not assessed, which could have impacted the study findings. Other associated comorbidities which lead to intra-abdominal pressure, such as obesity and constipation [14, 22], as well as conditions impairing thyroid function [30], have not been considered in this study, which may also have influenced the severity of the symptoms and HRQOL. To improve the HRQOL of the studied women, it is necessary to investigate the presence of these associated conditions and manage them with or without medication. Furthermore, different skill and experience levels of health workers can lead to inter-observer variability in assessing and documenting women and their symptoms, which may have influenced our results. Despite these limitations, this study provides valuable information that adds to the body of knowledge about HRQOL in parous women with POP or UI, either alone or in combination, using a standardized instrument. Furthermore, we recruited women from the community and the local clinic of a non-governmental development organization which offers health services to economically disadvantaged people. Thus, the study findings would be useful for health workers

Table 5 Stepwise linear regression analysis of variables with SF-12 scores (*N* = 357)

Variable	Physical component summary		Mental component summary	
	Coef. (SE)	*p* value	Coef. (SE)	*p* value
Age, ≥ 46 years	- 1.83 (0.74)	0.011	–	
Education, primary school or higher	–		1.98 (0.99)	0.046
UI only (ref. POP-UI)	3.58 (0.87)	< 0.001	6.31 (0.98)	< 0.001
POP only (ref. POP-UI)	2.35 (0.87)	0.006	–	

Only variables with $p < 0.05$. are shown

Coef. coefficient, *SE* standard error

at the primary healthcare level to help improve the HRQOL of these affected women.

Conclusion

POP and UI are common among women, and affected women experience both physical and mental burdens in their daily lives. The results of our study enhance the understanding of HRQOL in women with POP, UI, or POP-UI in Bangladesh as well as in other developing countries, where these illnesses are often inadequately documented. Our findings demonstrated that POP and UI were negatively associated with HRQOL in parous women, particularly in those with both conditions. Older age, low educational level, more severe UI, and mixed UI were also associated with decreased HRQOL. Healthcare providers should be aware of the significance of these illnesses and adequately address them to improve HRQOL. Owing to the nature of the problem, women need to be encouraged to seek treatment and actively undergo examinations to identify these illnesses during visits for prenatal and postnatal care and other gyneobstetric services. The investigation of both POP and UI should be offered to women complaining of symptoms related to either disorder for effective treatment. Further research must include evaluation of HRQOL after surgical or non-surgical treatment, which is rare in Bangladesh.

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Author contributions

• Imoto: Protocol/project development, data collection or management, data analysis, manuscript writing/editing.

• Sarker: Protocol/project development, data collection or management, manuscript editing.

• Akter: Protocol/project development, data collection or management, data analysis.

• Matsuyama: Protocol/project development, data collection or management, manuscript editing.

• Honda: Protocol/project development, data analysis, manuscript editing.

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Compliance with ethical standards

Conflict of interest None.

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