Quality of Life in Women with Urinary Incontinence Seeking Care Using E-Health

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Abstract

Background

Quality of life (QoL) in women with urinary incontinence (UI) is mainly affected by severity of UI, but also by, for example, UI subtype, comorbidity, age, and socioeconomic status. Using e-health to provide treatment for UI is a new method. In this study we investigate what factors have the highest impact on QoL in women who turned to e-health for self-management of UI.

Methods

Baseline data from three randomized controlled trials (RCT) for evaluating e-health treatments for UI were used, including 373 women with stress urinary incontinence (SUI), and 123 women with urgency/mixed UI (UUI/MUI). All participants were recruited online, with no face-to-face contact. We used the questionnaires International Consultation on Incontinence Questionnaire-Urinary Incontinence Short Form (ICIQ-UI SF) to measure UI severity, and ICIQ Lower Urinary Tract Symptoms Quality of Life (ICIQ-LUTSqol) to measure condition-specific QoL. To evaluate factors impacting on QoL, a linear regression model was used.

Results

The mean ICIQ-LUTSqol score was 34.9 (SD 7.6). The ICIQ-UI SF score (0-21) affected the ICIQ-LUTSqol (19-76), with an adjusted mean increase of 1.5 for each 1.0 increase in the overall ICIQ-UI SF score ($p < 0.001$). UUI/MUI gave an adjusted mean increase of 2.5 in ICIQ-LUTSqol score compared with SUI ($p < 0.001$).

Conclusion

As in women seeking other methods of care for UI, a decreased QoL was found in those who turned to e-health for self-management of UI. The impact of condition-specific factors on their QoL was slightly lower than that of women with UI who sought help in ordinary care, suggesting that e-health might reach a new group of women in need of treatment. Severity of the leakage had greater impact on QoL than type of UI.

Background

Urinary incontinence (UI) is common among women. It is defined as any involuntary leakage of urine, [1] and affects about 25% of adult women. There are three types of UI: stress urinary incontinence (SUI), urgency urinary incontinence (UUI), and mixed urinary incontinence (MUI). [2] SUI is leakage occurring with physical activity, sneezing or coughing; UUI is leakage associated with, or immediately preceded by, a sudden need to void; and MUI is a combination of the symptoms of SUI and UUI. [1] Of the incontinent women, about one in ten leaks urine every day. Both prevalence and severity of UI increase with age. [2] SUI is the most common type, affecting about 50% of women with UI, with symptoms highest among the middle-aged, and thereafter decreasing with age. UUI and MUI have a higher incidence in older women, increasing with age. [3]

First line treatment for all types of UI is pelvic floor muscle training (PFMT). About two in three women are cured or improved by PFMT. [4] For UUI and MUI, bladder training can be a complement to the PFMT treatment. [5] Before treatment, type and severity of UI can be diagnosed using patient-reported measurements, including questionnaires, voiding diaries, and validated rating scales. [6]

Quality of life (QoL) is recommended as an outcome measure for evaluation of treatment of UI, [7] and can be measured in different ways, including generic and condition-specific questionnaires. Women with UI show a lower estimated QoL than women in general, decreasing with severity of UI. The type of UI affects QoL to different degrees, with UUI the subtype that demonstrates the highest negative impact, and other factors – such as age, socioeconomic parameters, concurrent medical conditions, and duration of UI-symptoms – all have a negative impact on condition-specific QoL. [8] Even so, only a minority of women with UI seek care. [9] Reasons for not seeking help include having low expectations of the treatment and being too embarrassed. [10, 11] Also, there is a belief that UI comes with age, should be accepted as normal, and that nothing can be done to improve the symptoms. There is a social stigma regarding UI, as well as a distrust in healthcare from some women. [11] New, easily accessible ways of treatment are therefore needed.

E-health is defined by the World Health Organization as the use of information and communication technologies for health. It is a growing field that may increase access to healthcare for those who, for example, have limited access to ordinary care or are unwilling or too embarrassed to seek care. [12] Both diagnostics and training programmes for self-management of UI can be performed without face-to-face contact, using e-health. [6, 13, 14]

Women seeking care using e-health are younger, have a higher level of education, and a higher income than people in general. [15] What is not known is whether women with UI seeking care using e-health experience the same impact on QoL as women seeking care for their UI in other ways.

The purpose of this project was to evaluate condition-specific QoL in women who turned to e-health for self-management of UI. We wanted to investigate whether the severity of UI would have the highest impact on QoL in the women in this population. We also wanted to investigate whether QoL would be affected by type of UI, age, education, and comorbidity, and if UUI/MUI would give a lower QoL than SUI.

Materials And Methods

eContinence.se

This project is based on data collected at baseline in three different randomized controlled trials (RCT) in the eContinence research project at Umeå University, Sweden, registered on clinicaltrials.gov (ID: NCT01032265, NCT01848938, NCT03097549), including a total of 496 participating women. The eContinence project aims to develop, evaluate, and implement treatment programmes for UI using e-health. The principal investigator responsible for eContinence.se is Eva Samuelsson, professor at Umeå University. [16]

The three RCTs were conducted between 2009 and 2018, with the aim to evaluate self-management of SUI via the Internet (RCT one) and via the app Tät® (RCT two), and to evaluate self-management of MUI and UUI via the app Tät® II (RCT three). Community-dwelling women were recruited from all over Sweden, via the project's website (www.tät.nu), and throughout the process there was no face-to-face contact between the study participants, researchers, and healthcare providers in any of the three RCTs. The treatments have been evaluated with regard to effectiveness in the short (three months) [17−19] and long (up to two years) term. [20, 21] UI treatment focusing on mainly PFMT, provided via internet or a mobile app, showed clinically relevant symptom improvement as well as improvement in QoL. [17−21]

In Table 1, enrolment process information and inclusion and exclusion criteria for the three RCTs can be found. Further information is also available in the original articles. [17−19]

Table 1

Overall information, inclusion and exclusion criteria, and enrolment process, in three randomized studies for women with urinary incontinence (UI) using e-health.

	RCT one	RCT two	RCT three
Time span	2009–2011	2013–2014	2017–2018
Inclusion criteria	- Female - Ability to read and write Swedish - Access to internet/smartphone/e-mail		
	- Age 18–70 years - SUI ≥ 1 episode/week	- Age ≥ 18 years - SUI ≥ 1 episode/week for the last 6 months	- Age ≥ 18 years - UUI/MUI ≥ 2 episode/week for the last 12 months
Exclusion criteria	- Pregnancy - Previous UI surgery - Macroscopic haematuria - Known malignancy in the lower abdomen - Difficulties with passing urine - Intermenstrual bleedings - Impaired mobility or sensibility in the legs or lower abdomen		
	- Severe psychiatric disorders, or HADS score > 15 for depression or anxiety - Max. voiding volume < ≈ 0.3L and mean micturition volume < ≈ 0.2L	- Severe psychiatric disorders - Max. voiding volume < 0.3L	- Use of another PFMT app - Use of mirabegron or antimuscarinic drugs - Painful urges or micturition - Previous pyelonephritis - ≥3 urinary tract infections in the last 12 months - Previous stroke, neurological disease, or diabetes. - Max. voiding volume ≤ 0.15L
Study invitations	- www.econtinence.se		

RCT Randomized controlled trial; *UI* Urinary incontinence; *SUI* Stress UI; *UUI/MUI* Urgency UI/Mixed UI; *HADS* Hospital Anxiety and Depression Scale; *PFMT* Pelvic Floor Muscle Training

	RCT one	RCT two	RCT three
	- Daily newspapers - Websites for medical advice	- Daily newspapers - On the web - Facebook - Posters at health centres and training centres	- Newspapers - Facebook - Radio - TV
Enrolment process	1. Screening questionnaire homepage (n = 684) 2. Postal questionnaire, informed consent, 2-day bladder diary (n = 287) 3. Telephone interview urotherapist (n = 277)	1. Screening questionnaire homepage (n = 805) 2. Informed consent, 2-day bladder diary, maximum voiding volume (n = 345) 3. Web-based questionnaire, telephone interview (n = 129)	1. Screening questionnaire homepage (n = 1241) 2. Informed consent, 2-day bladder diary, maximum voiding volume, web-based questionnaire, telephone interview incontinence nurse or general practitioner (n = 142)
Randomization	250 women	123 women	123 women
Age span	23–70 years	27–72 years	31–77 years
Randomization arms	- Internet-based treatment programme (n = 124) - Postal treatment programme (n = 126)	- Treatment app (n = 62) - Control group (n = 61)	- Treatment app (n = 60) - Information app (n = 63)

RCT Randomized controlled trial; *UI* Urinary incontinence; *SUI* Stress UI; *UUI/MUI* Urgency UI/Mixed UI; *HADS* Hospital Anxiety and Depression Scale; *PFMT* Pelvic Floor Muscle Training

Questionnaires

Baseline data collected in the RCTs included information about age, education, use of prescription drugs, and severity of leakage, using the International Consultation on Incontinence Questionnaire-Urinary Incontinence Short Form (ICIQ-UI SF), [22] as well as condition-specific QoL, using the International

Consultation on Incontinence Questionnaire Lower Urinary Tract Symptoms Quality of Life (ICIQ-LUTSqol). [23]

ICIQ-UI SF is a highly recommended [7] and validated questionnaire for evaluating symptom severity of UI. [22] It includes three items regarding frequency, amount of leakage, and overall impact on QoL, as well as a non-scored self-diagnostic item, to assess the type of UI. The scoring scale is additive, reaching from 0–21, with greater values indicating increased severity. The overall scores can be divided into four severity categories: slight 1–5 points, moderate 6–12 points, severe 13–18 points, and very severe 19–21 points. [24]

ICIQ-LUTSqol is a highly recommended [7] and validated questionnaire for evaluating condition-specific QoL. [23] It includes 19 scored items, each giving one to four points, with an additive overall score from 19–76, with greater values indicating increased impact on QoL. The ICIQ-LUTSqol items can be divided into six different domains, including role limitation, physical limitations, social limitations, personal relationships, emotions, and sleep. [25]

Definitions

We defined comorbidity as the regular use of any prescribed medication (RCT one and two) or any prescribed medication for heart and vessel diseases, oestrogen, hormonal IUD, or drugs to treat incontinence, depression, anxiety, or asthma (RCT three).

Educational level, i.e. university education or not, was used as a proxy for socio-economic status.

Statistics

For this study, we used the baseline datasets previously collected in the three RCTs. To save baseline overall scores in ICIQ-UI SF and ICIQ-LUTSqol, values for five missing items in RCT one, and for one missing item in RCT two, had been imputed from the first follow-up in each study. Values were only imputed when a single or a few answers were lacking; otherwise the overall score was set as missing.

For comparison between groups, Chi-square tests were used for categorical variables, and ANOVA or independent-samples t-tests for continuous variables. Kruskal-Wallis was used in case of non-normally distributed data and Fisher's exact test in those cases when the group sample size was small.

A linear regression model was used to evaluate which variable, including age, any university education, comorbidity, type of UI, or severity of UI, had the highest impact on the ICIQ-LUTSqol scores and thereby the highest impact on condition-specific QoL. Both unadjusted and adjusted analyses were performed, and 95% Confidence Intervals (CI) calculated. Significance level for all analyses were set at 0.05 and all p values below 0.05 were considered significant. SPSS statistics version 27 has been used for all analyses.

Results

Baseline characteristics for participants in each of the three RCTs and overall are presented in Table 2. The women in RCT three (UUI/MUI) were older, had a higher BMI, and more severe leakage with higher impact on QoL, than the women in RCT one and two (SUI). The highest level of education was found in the women in RCT two, followed by the women in RCT three.

Table 2
Baseline characteristics in women with urinary incontinence (UI) who have sought care using e-health, in three randomized studies

Variable	RCT one[c] (n = 250)	RCT two[c] (n = 123)	RCT three[d] (n = 123)	p values	Total (n = 496)
Age, years, mean (SD)	48.6 (10.2)	44.7 (9.4)	58.3 (9.5)	< 0.001[h]	50.1 (11.0)
BMI, kg/m^2, median (IQR)	23.5 (21.9–26.5)[a]	23.2 (21.4–25.9)	25.2 (23.2–28.6)	< 0.001[i]	23.9 (22.0-26.9)[a]
University education ≥ 3 years, n (%)	135 (54.0)	98 (79.7)	79 (64.2)	< 0.001[j]	312 (62.9)
Any university education, n (%)	188 (75.2)	107 (87.0)	105 (85.3)	0.008[j]	400 (80.6)
Daily smokers, n (%)	9 (3.6)	5 (4.1)	0 (0)	0.055[k]	14 (2.8)
Nulliparous, n (%)	16 (6.4)	9 (7.3)	15 (12.2)	0.145[j]	40 (8.1)
Comorbidity[e], n (%)	102 (41.1)[b]	52 (42.3)	43 (35.0)	0.428[j]	197 (39.9)[b]
ICIQ-UI SF score[f], mean (SD)	10.4 (3.3)	11.1 (2.8)	11.6 (3.3)	0.003[h]	10.9 (3.2)
Severity of UI:	14 (5.6)	3 (2.4)	3 (2.4)	0.095[k]	20 (4.0)
Slight, n (%):	170 (68.0)	78 (63.4)	73 (59.3)		321 (64.7)
Moderate, n (%):	66 (26.4)	42 (34.1)	47 (38.2)		155 (31.3)
Severe/Very severe, n (%):					
ICIQ-LUTSqol score[g], mean (SD)	33.6 (7.5)[a]	34.4 (6.1)	37.8 (8.2)	< 0.001[h]	34.9 (7.6)[a]

[a] One missing; [b] Two missing

[c] Women with Stress UI; [d] Women with Urgency UI/Mixed UI

[e] Comorbidity defined as regularly use of prescription drugs

[f] International Consultation on Incontinence Questionnaire-Urinary Incontinence Short Form (ICIQ-UI SF) measuring symptoms

[g] International Consultation on Incontinence Questionnaire Lower Urinary Tract Symptoms Quality of Life (ICIQ-LUTSqol) measuring condition-specific quality of life

Variable	RCT one[c] (n = 250)	RCT two[c] (n = 123)	RCT three[d] (n = 123)	p values	Total (n = 496)
[h] p values by ANOVA; [i] p values by Kruskal-Wallis test; [j] p values by Chi-square test; [k] p values by Fisher's exact test					
RCT Randomized controlled trial; BMI Body Mass Index; SD Standard Deviation; IQR Interquartile range					

Severity of UI and QoL are presented for the UI subtype groups in Table 3. Participants with UUI or MUI had more severe leakage (mean ICIQ-UI SF score 11.6 (SD 3.3) vs. 10.6 (SD 3.2)), with higher impact on QoL (mean ICIQ-LUTSqol score 37.8 (SD 8.2) vs. 33.9 (7.1)), compared to those with SUI.

Table 3
ICIQ-UI SF score, severity of UI and ICIQ-LUTSqol score for women with stress urinary incontinence (SUI) versus urgency or mixed urinary incontinence (UUI/MUI), who have sought care using e-health

Variables	SUI (n = 373)	UUI/MUI (n = 123)	p value
ICIQ-UI SF score, mean (SD)	10.6 (3.2)	11.6 (3.3)	0.004[b]
Severity of UI:	17 (4.6)	3 (2.4)	0.136[c]
Slight, n (%):	248 (66.5)	73 (59.3)	
Moderate, n (%):	108 (29.0)	47 (38.2)	
Severe/Very severe, n (%):			
ICIQ-LUTSqol score, mean (SD)	33.9 (7.1)[a]	37.8 (8.2)	< 0.001[b]
[a] One missing; [b] p values by independent-samples t-test; [c] p value by Fisher's exact test			
UCIQ-UI SF International Consultation on Incontinence Questionnaire-Urinary Incontinence Short Form; ICIQ-LUTSqol International Consultation on Incontinence Questionnaire Lower Urinary Tract Symptoms Quality of Life; SD Standard deviation			

Overall, the greatest impact on QoL was seen in the domains of physical limitations (mean score 4.6 (SD 1.2), 57.5 % of maximum score), role limitation (mean score 4.1 (SD 1.4), 51.3 % of maximum score), and emotions (mean score 5.1 (SD 1.8), 42.5 % of maximum score). In Fig. 1, the impact of the leakage on the different ICIQ-LUTSqol domain scores are presented for the three RCTs. Women with UUI/MUI showed significantly greater impact on domains concerning role limitation, social limitations, emotions, and sleep, compared with women with SUI.

The results of the linear regression model are presented in Table 4. The more severe the leakage, the more impact on QoL, with a mean increase of 1.5 in the overall ICIQ-LUTSqol score for each increase of 1.0 in the overall ICIQ-UI SF score. Regarding type of UI, UUI/MUI rendered an increase of 2.5 in the overall ICIQ-LUTSqol score, compared with SUI. Participants without any university education had a mean of 2.1 higher ICIQ-LUTSqol score than those with university education. For the participants with comorbidity, the

mean ICIQ-LUTSqol score was 1.2 higher than for those without any comorbidity. Age showed no significant difference in the model. The results were all adjusted for age, university education, comorbidity, type of UI, and ICIQ-UI SF score.

Table 4

Regression analysis summary for factors impacting on ICIQ-LUTSqol scores, for women with UI, using e-health

Variable	Unadjusted B[a]	95% CI	p value	Adjusted B[a]	95% CI	p value
Age (n = 495) (continious variables 23–77)	0.1	0.0-0.1	0.038[c]	< 0.1	0.0-0.1	0.377[c]
Any university education (n = 495) (yes or no)	2.4	0.7–4.1	0.005[c]	2.1	0.9–3.4	0.001[c]
Comorbidity (n = 493) (no comorbidity compared to having comorbidity)	1.9	0.5–3.3	0.006[c]	1.2	0.2–2.2	0.023[c]
Type of UI (n = 495) (SUI compared to UUI/MUI)	3.9	2.4–5.4	< 0.001[c]	2.5	1.2–3.7	< 0.001[c]
ICIQ-UI SF score (n = 495) (continious variables 0–21)	1.6	1.4–1.7	< 0.001[c]	1.5	1.3–1.7	< 0.001[c]
Adjusted total no: 493						
International Consultation on Incontinence Questionnaire Lower Urinary Tract Symptoms Quality of Life (ICIQ-LUTSqol) is a continious variable valued at 19–76						
[a] B: regression coefficient						
[b] Comorbidity defined as regularly use of prescription drugs						
[c] p values by Linear regression						
UI Urinary incontinence; SUI Stress UI; UUI/MUI Urgency UI/Mixed UI; ICIQ-UI SF International Consultation on Incontinence Questionnaire-Urinary Incontinence Short Form; CI Confidence Interval						

Discussion

In this secondary analysis using baseline data from three RCTs, we found that QoL was decreased in women seeking care for UI using e-health, and that it was the severity of the leakage that had the highest impact on QoL. Type of UI also affected QoL, but not to the same extent. Lack of university education and comorbidity both had a negative impact on QoL, but age itself had no significant effect.

In our study, the mean ICIQ-UI SF score for all included women was 10.9, which corresponds to a moderate leakage [24], and the mean ICIQ-LUTSqol score was 34.9. Slightly lower scores were found in a survey from 2015 that included women in the age 45–60 years in the UK, France, Germany, and the USA, with unspecified subtypes of UI, who filled out a questionnaire via the Internet. These results showed a moderately severe leakage (overall ICIQ-UI SF score 8.7) with a mean ICIQ-LUTSqol score of 32.8 for the 1,203 participants. [26] Comparing to studies including women who sought care for their UI in ordinary ways, an RCT from urban parts of Malaysia, including baseline data from 120 women with SUI receiving non-surgical treatment for their UI, showed a mean ICIQ-UI SF score of 10.0 and a mean ICIQ-LUTSqol score of 39.0, giving it a slightly lower impact on severity, but slightly higher impact on QoL compared to our study population. [27] Moreover, an RCT including 600 women with newly clinically diagnosed SUI or MUI, conducted in centres providing continence care in the UK, showed slightly higher mean ICIQ-UI SF score (12.4), but still moderate severity, as well as somewhat higher mean ICIQ-LUTSqol score (42.9) compared to our study. [28] Thus, the level of severity was moderate in all the studies, but our study population experienced a slightly higher impact on QoL compared to the women in the survey, as well as a slightly lower impact on QoL compared to those who sought care for their UI in ordinary ways. These results could indicate the possibility to partly reach a new group of women that perhaps would not have sought care in ordinary ways, but still have a clear impact on their QoL.

Overall, the participants in our study saw the highest impact on QoL in the domains concerning physical limitations, role limitations (including household tasks and daily activities), and emotions. The women with UUI/MUI had more severe leakage and a higher impact on social limitations, emotions, role limitation, and sleep, than the women with SUI. We have found no other studies comparing SUI to UUI/MUI that considers the ICIQ-LUTSqol domains. However, in a study by Abrams et al. from 2015, the domains have been compared, with the participants divided into severity categories, and for the women with more severe UI, the greatest impact on QoL was shown in the domains social limitations and emotions. [26]

The regression analysis showed that in our population, the severity of the leakage was the factor that had the greatest impact on QoL, which, as other studies have shown the same result, was expected. A large study from 2007 on women seeking care in ways other than e-health, showed severity being the single most important predictor on QoL for women with UI, regardless of type of UI. [8] In another study from 2018 exploring the relationship between mental health, sleep, and physical function and type of UI and severity, it was shown that in 510 women seeking help for UI symptoms, severity of UI rather than type had the greatest impact on anxiety, depression, and stress. [29] In our study, it may at first sight look as though the type of UI is the most important factor since the adjusted beta is 2.5, while adjusted beta for severity is only 1.5. However, it should be borne in mind that type of UI is a dichotomous variable, where the increase can only take place once, while severity according to ICIQ-UI SF is a continuous variable that allows greater variation and thus a much greater potential impact on the ICIQ-LUTSqol score.

Strengths

To our knowledge, this is the first study to evaluate condition-specific QoL specifically in women with UI seeking care using e-health. One strength of this study is the relatively large number of participants, in combination with only a few missing values. Another strength is that the participants were actively seeking treatment, and thus represent a clinically relevant group. Moreover, the research group conducting the studies has solid clinical competence, and the diagnoses of SUI as well as UUI/MUI are well established. In the analyses, we were able to include many variables that possibly affect QoL, and we worked in close collaboration with statisticians. For easier comparison with other studies, we have used validated and recommended questionnaires to measure severity of UI and condition-specific QoL. [7, 22, 23]

Limitations

There are also some possible limitations in this study. There was a considerably smaller group of participants with UUI/MUI than with SUI (123 versus 373 women), and this might have affected the results. Also, 80.6% of the participating women had a university education, compared to 47% of all Swedish women aged 25–64 years in 2015, [30] and there is a risk that our population is not comparable to other women with UI in need of treatment. However, since e-health to date is mostly used by those with higher education [15], our population may well represent other women seeking care using e-health. Another limitation is that we were restricted to the data collected in the previous RCTs, and there might be other, for us unknown, factors that also influence the QoL of our participants. For example, psychological illness may have an impact on condition-specific QoL, but questions about anxiety and depression were only included in the baseline questionnaires in two of the three RCTs, and thus could not be further explored. Moreover, there is a risk that we underestimate the presence of comorbidity (e.g. endocrinological diseases etc.), especially in RCT three, by the definition used. The reason for our choice of definition was that different wording was used in the questions regarding prescribed medication and concurrent diseases in the three RCTs. The data concerning prescription drugs versus diseases in RCT one and three were comparable, and therefore prescribed medication was used as a marker of comorbidity. Finally, from the start of the first RCT to the third RCT, eight years have passed. During this time-span, the fast-growing field of e-health has developed rapidly, and this may have affected the results.

Clinical implications and future perspectives

The results in our study show that women with UUI/MUI and women with SUI, who seek care using e-health, have an impact on their condition-specific QoL, mainly related to severity, and not type, of UI. Since treatment of UI can decrease the symptom severity and therefore improve QoL, effective and easily accessible treatments for everyone with UI, regardless of subtype, is important. An individual assessment of each UI patient is also needed, with a careful assessment of the severity of their leakage to provide adequate help to them.

A considerable amount of research has been performed considering QoL in women with UI in general, but not specifically of those who seek medical care for UI through e-health. Our study contributes to new

knowledge about this group of women, which may help to develop and improve this kind of treatment. Providing treatment using e-health could contribute to new and cost-effective ways to help women with UI, and lead to both financial savings and to increased QoL for the individual. Easily accessible self-management treatment programmes by Internet or mobile applications may facilitate the access to medical care for this group of patients and at the same time relieve pressures on primary care.

For future research, factors that separate this study population from those who seek care in other ways could be worth investigating further.

Conclusion

Women who turned to e-health for self-management of UI had a decreased QoL, but with slightly lower impact of condition-specific factors than that of women with UI who sought help in ordinary care, suggesting that e-health might reach a new group of women in need of treatment. Although UUI/MUI had a greater impact than SUI, it was the severity of the leakage that affected QoL the most in this population.

Abbreviations

BMI, Body Mass Index; CI, Confidence Interval; HADS, Hospital Anxiety and Depression Scale; ICIQ-LUTSqol, International Consultation on Incontinence Questionnaire Lower Urinary Tract Symptoms Quality of Life; ICIQ-UI SF, International Consultation on Incontinence Questionnaire-Urinary Incontinence Short Form; IQR, Interquartile range; MUI, Mixed Urinary Incontinence; PFMT, Pelvic Floor Muscle Training; QoL, Quality of Life; RCT, Randomized Controlled Trial; SD, Standard deviation; SUI, Stress Urinary Incontinence; UI, Urinary Incontinence; UUI, Urgency Urinary Incontinence

Declarations

Ethics approval and consent to participate

The Swedish Ethical Review Authority approved the project (nr 2020-06300). All study participants gave their written informed consent before inclusion in the RCTs.

Consent for publication

Not applicable.

Availability of data and material

The datasets used during the current study are available from the corresponding

author on reasonable request.

Competing interests

Funding

Author's contributions

IA and MS were the main contributors in the data collection. All authors contributed in the analysis and interpretation of the data. YÅ and MS were the major contributors in the writing of the manuscript. All authors read and approved the final manuscript.

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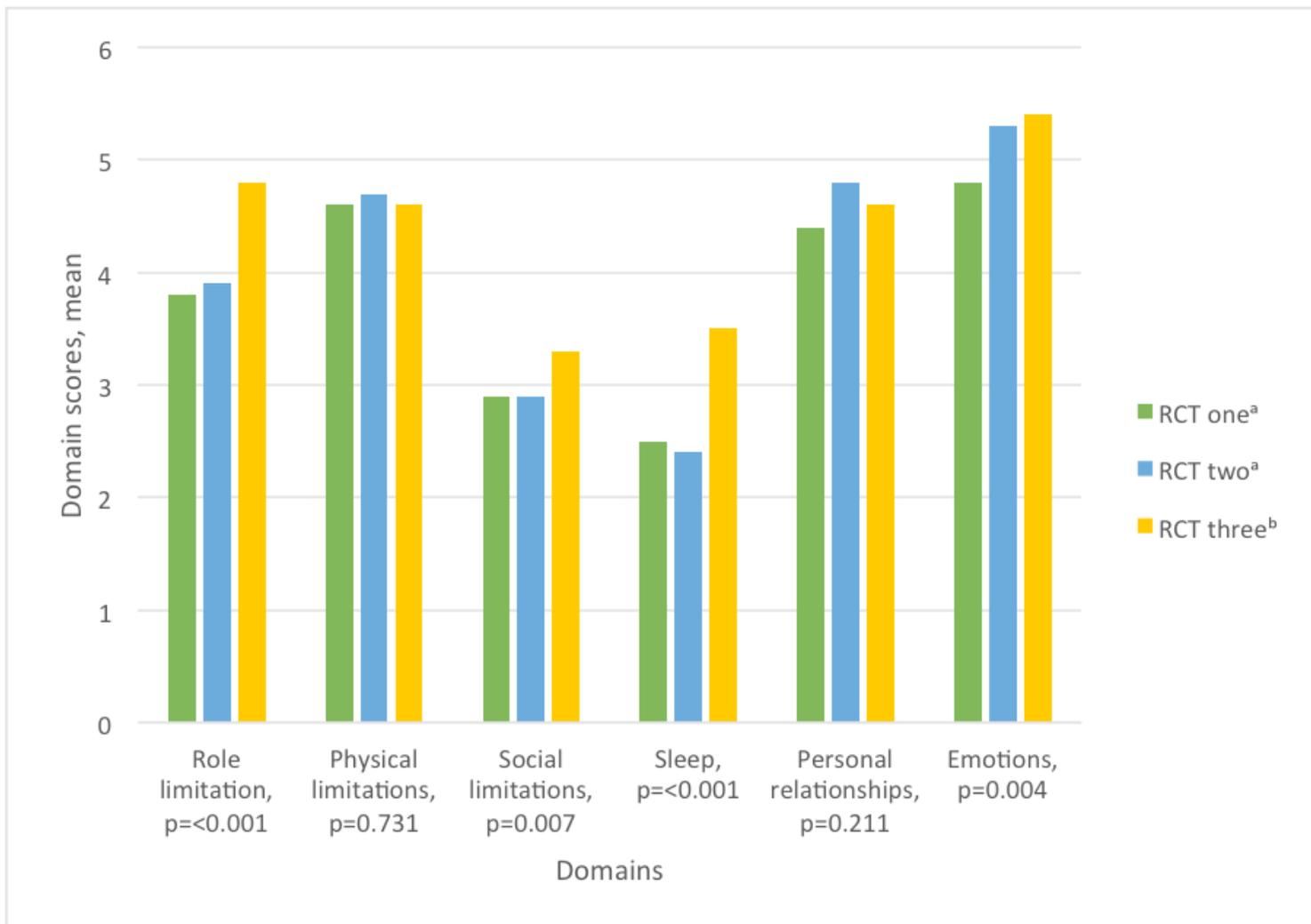
Figures

Figure 1

ICIQ-LUTSqol domain scores for women with urinary incontinence (UI), who have sought care using e-health, in three different randomized controlled studies (RCT)