Effect of Nano-Teaching on Knowledge and Practices of Multipara Women Regarding Stress Urinary Incontinence

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Abstract

Background: Despite stress urinary incontinence isn't a life-threatening condition, it has the potential to significantly affect various aspects of multipara women's health-related quality of life, encompassing their physical, psychological, and social well-being. **The aim of this study:** was to assess the impact of nano-teaching on knowledge and practices of multipara women regarding stress urinary incontinence. **Subjects and Method:** A quasi-experimental research design was used to conduct this study and the study was carried out in the outpatient clinics of Tanta University Hospital, El-Menshawy Hospital, and EL-Mabara Hospital. The study sample consisted of 100 multipara women with stress urinary incontinence, selected purposively from the aforementioned healthcare settings. Data collection was conducted using **four tools**, **Tool I** Multipara Women's knowledge regarding stress urinary incontinence structured questionnaire, **Tool II:** Multipara Women's Self-care practices regarding stress urinary incontinence, **Tool III:** The Incontinence Severity Index (ISI), and **Tool IV**: Quality of life questionnaires among women with stress urinary incontinence (QOL). **Results:** There was a significant statistical improvement in the overall knowledge, practices, severity of incontinence, and quality of life scores of multipara women following the implementation of nano teaching (P=0.0001). Additionally, there was a significant positive correlation between total knowledge scores and total practice scores before and after the introduction of nano teaching. **Conclusion:** The knowledge and practices of multipara women regarding stress urinary incontinence improved after the implementation of nano teaching. **Recommendation:** It is recommended to develop and implement training programs for multipara women with stress urinary incontinence in order to enhance, update, and improve their knowledge and practices.

Introduction

Urinary incontinence, a condition characterized by the involuntary release of urine, has a significant impact on an individual's health and quality of life. There are five distinct types of urinary incontinence, namely stress urinary incontinence, urge urinary incontinence, mixed urinary incontinence, overflow urinary incontinence, and functional urinary incontinence (Seshan et al., 2023). Among multipara women, stress urinary incontinence (SUI) is a commonly observed health issue. While not life-threatening, SUI can greatly diminish individuals' physical, psychological, and social well-being, thus affecting their overall quality of life in a broader sense when compared to other medical conditions (Wang et al., 2022).

The International Urogynecological Association (IUGA) and the International Continence Society (ICS) define stress urinary incontinence (SUI) as the involuntary leakage of urine in the presence of increased intra-abdominal pressure without detrusor activation **(AlQuaiz et al., 2023).** Stress urinary incontinence is the result of weakening or damage of the pelvic floor muscles and the urethral sphincter. There are multiple risk factors that cause weakening of the pelvic floor muscles such as gestational diabetes mellitus, constipation, maternal age, obesity, smoking, hysterectomy, menopause, heavy physical work and gruelling physical training. In addition to pregnancy and childbirth complications, such as excessive number of pregnancies, parity, interventional births, episiotomy, spontaneous tears or lacerations **(Sawaqed et al., 2020; Dinc 2018).**

Although the different risk factors, pregnancy and childbirth are considered the primary predisposing factors for stress urinary incontinence. The prevalence of SUI during pregnancy has been identified as a predictor of UI even up to 5 years after delivery, regardless of the mode of delivery. Pregnancy brings about various changes in maternal anatomy, physiology, and biochemistry to accommodate the developing fetus. Hormones related to pregnancy, such as relaxin, collagen, and progesterone, also contribute to the occurrence of urinary incontinence (Syeda et al., 2022; Gari et al., 2023).

The prevalence of SUI is significantly higher in women compared to men, affecting 17-45% of women globally. SUI accounts for 48% of all cases of urinary incontinence. In a study conducted at Assuit governorate, Egypt, the prevalence of urinary incontinence among women was found to be 54.8%. Among these cases, the

prevalence of urge incontinence, stress incontinence, and mixed incontinence were 15%, 14.8%, and 25%, respectively. However, obtaining consistent epidemiological data on urinary incontinence is challenging due to feelings of shame, embarrassment, and fear of discrimination (Soliman et al., 2020; Fathy and Atef, 2020).

Signs and symptoms of SUI divided into three groups: storage symptoms (urgency, frequency and nocturia), voiding symptoms (hesitancy, slow stream, intermittent stream, straining and terminal dribbling), as well as post micturition symptoms (feeling of incomplete evacuation and post micturition dribble). Stress urinary incontinence could cause physical and psychological complications such as urinary tract infection, skin rash, loss of self-esteem, sleep disturbance, depression, social isolation, limited daily activities and reduced quality of life. However, appropriate and timely diagnosis are helpful in evaluating and treating the affected women and improving their quality of life and preventing the occurrence of the complications **(Yang et al., 2023; Rushidova et al., 2023)**.

Treatment of SUI subdivides into behavioral, pharmacological, and surgical management. Behavioral methods include: practicing kegel exercise to strength the pelvic floor muscle; life style modification such as avoid constipation, cough and avoid carrying heavy objects; maintain a healthy weight; avoid bladder irritants such as (caffeine, alcohol and acidic foods) and bladder retraining through regular scheduling of urination which lead to an empty bladder for longer periods throughout the day. Additionally, electro stimulation via acupuncture needles for 30 minutes weekly for 12 weeks followed by monthly maintenance sessions and the use of pessaries. While pharmacological treatment includes, estrogen and anti-cholinergic drugs **(Patel et al., 2023; Charette et al., 2023)**.

Despite the fact that SUI is a stressful problem, multipara women may not seek for treatment. The reasons for not seeking treatment are multifaceted such as embarrassment, stigma, and lack or insufficient knowledge among the affected women. The nurse as an important professional person in the care of women with urinary incontinence could provide emotional support and help women to express their fears and worries. The nurse also acts as an educator who should provide health education for women and their families about pelvic floor muscle training exercises, behavior and life style modification **(Tunn et al., 2023)**.

Nano-teaching, a novel approach in nursing education, has emerged as a strategy to address decreasing attention spans. This approach involves delivering knowledge in smaller portions and shorter durations, typically ranging from 5 to 15 minutes. By utilizing brief video tutorials or infographics,

important and complex health information, such as stress urinary incontinence, can be visually presented in an appealing manner that is easily comprehensible. This method has gained support as it aligns with patient-centered care and aids in counseling, as endorsed by the American College of Obstetricians and Gynecologists (ACOG) (Aburizaizah and Albaiz, 2021; El-Kurdy et al., 2022; Curreli and Rakich, 2020; McKinney et al., 2022). Therefore, the utilization of nano-teaching sessions is considered an effective and practical approach to impart knowledge to this specific group of women.

Significance of the Study

Stress urinary incontinence is a highly prevalent issue worldwide that causes significant distress and embarrassment to individuals and societies. In Egypt, half of the female population experiences urinary incontinence **(Central Agency for Public Mobilization and Statistics (CAPMAS) 2021)** with 86% of cases had sexual problems, 15% of them had sleep disturbance and 25% of them were suffering from social isolation. Moreover, there is a universal agreement about the significance of the problem in terms of human suffering and economic cost (**Gouda et al., 2022).**

Despite its common occurrence, urinary incontinence remains a neglected problem with inadequate healthcare-seeking behavior. It is estimated that 50-70% of women with stress urinary incontinence do not seek medical evaluation and treatment due to the social stigma associated with it.

Thus, it becomes an increasingly vital to educate the women about stress urinary incontinence and its complication. This empowers the affected women to seek health care in order to decrease the implications of SUI on women's physical, psychological and economic status **(Helmy et al., 2022; Soysal et al., 2023)**. So, the aim of the current study was to determine the effect of nano-teaching on knowledge and practices of multipara women regarding stress urinary incontinence.

Aim of the study:

The aim of this study was to determine the effect of nano-teaching on knowledge and practices of multipara women regarding stress urinary incontinence.

Research hypotheses:

Multipara women's knowledge and practices were expected to be improved after implementation of the nano-teaching regarding stress urinary incontinence.

Sub hypotheses:

- Multipara women's severity of urinary incontinence was expected to be decreased after implementation of the nano-teaching regarding stress urinary incontinence.
- The implementation of nano-teaching on stress urinary incontinence was expected to improve the quality of life for multiparous women.

Subjects and Method:

Research design: A quasi-experimental research design was employed for this study.

Settings: Study was conducted at the outpatient clinics of:

- Tanta University hospital affiliated to Ministry of Higher Education and Scientific research.
- El-Menshawy hospital affiliated to Ministry of Health and Population.
- EL- Mabara Hospital affiliated to the Health Insurance.

The gynecological outpatient clinics at Tanta University Hospital located in the outpatient clinics building in the second floor which consisted of two gynecological clinics. El-Menshawy General Hospital consisted of two gynecological outpatient clinics and EL- Mabara Hospital consisted of one gynecological outpatient clinic. There was a lecture room in each outpatient clinics equipped with computer and data-show where the researchers met the studied women.

Subjects:

A purposive sample of 100 multipara women who suffer from stress urinary incontinence were chosen from the aforementioned settings based on the following inclusion criteria.

- Multipara women.
- Women who aged from 35 to 60 years old.
- Women who diagnosed with stress urinary incontinence or pelvic floor organ prolapse for at least two months ago.
- Women who suffered from at least one episode of SUI per week.
- Women who are willing to participate in the study.

Exclusion criteria:

- Women who had neurological problems.
- Women with urinary tract infection, diabetes mellitus, hepatitis, and ascites.

The sample size was calculated using Epi-Info software statistical package created by World Health Organization and center for Disease Control and Prevention, Atlanta, Georgia, USA version 2002.

The criteria used for sample size calculation were as follow:

- 95 % confidence limit.
- 80% power of the study.
- Expected outcome 90% after nano-teaching compared to 65% before.

$$n = \frac{\left(\frac{z}{d}\right)^2 \times (0.50)^2}{1 + \frac{1}{N}\left[\left(\frac{z}{d}\right)^2 \times (0.50)^2 - 1\right]}$$

Where n = Community size, Z = the standard score corresponding to the significance level is 0.95 and is equal to 1.96 and D = mistake percentage.

Tools of data collection:

To achieve the aim of this study, four tools were developed and used for data collection:

Tool I: Multipara Women's knowledge regarding stress urinary incontinence structured questionnaire:

It was developed by the researchers after reviewing the recent related literatures **(Moustafa et al., 2022; Suchithra et al., 2020; Parra et al., 2023)** to collect the basic data regarding the study subjects as well as knowledge about stress urinary incontinence. It included four parts as follows:

- **Part one: Demographic characteristics of the studied multipara women:** This part was developed to collect basic data about general characteristics of the study subjects included: age, current marital status, age at marriage, religion, education, occupation, residence, telephone number, family income, and type of family.

- **Part two: Obstetrical history** which included gravidity, parity, place of antenatal care, and number of antenatal visits, attendance of antenatal care classes, mode of previous delivery and previous pregnancy as well as delivery complications.

- **Part three: Medical history of stress urinary incontinence:** included duration of stress urinary incontinence, signs of stress urinary incontinence and previous treatment of stress urinary incontinence.

- **Part four: Assessment of multipara women′s knowledge regarding stress urinary incontinence:** This part developed to assess multipara women's knowledge about stress urinary incontinence which included definition, signs and symptoms, complications and management of women with stress urinary incontinence.

The scoring system for women′s knowledge was categorized as follows:

- Correct and complete answers were scored as (2 marks).
- Correct and incomplete answers were scored as (1 mark).
- Incorrect and didn't know were scored as (zero).

The total score level of women′s knowledge was calculated. Then, it was categorized as follows:

- High level of knowledge ≥ 75%.
- Moderate level of knowledge 60 % - <75%.
- Low level of knowledge <60%.

Tool II: Multipara women′s self-care practices regarding stress urinary incontinence:

It was developed by the researchers after reviewing the recent related literatures **(Abu Raddaha and Nasr 2022; Curillo-Aguirre and Gea-Izquierdo 2023)** to measure multipara women′s self-care practices regarding stress urinary incontinence which included:

- **Practice bladder training:** The woman is asked to urinate at regular intervals, slowly the time interval is increased. This causes the bladder to stretch and hold more amount of urine.

- **Practice pelvic floor muscle exercise (kegel exercise):** First the women empty the bladder, then sit or lie down. Tighten the   pelvic floor muscles. Hold tight and count 3 to 5 seconds, then relax the muscles and count 3 to 5 seconds. Repeat this step 10 times, 3 times a day (morning, afternoon, and night). The women breathe deeply and relax the body when doing these exercises.

- **Life style modification** which included avoid constipation, cough and carrying heavy objects; try to maintain a healthy weight; avoid bladder irritants such as caffeine, alcohol and acidic foods; avoid drinking water at bed time; entering bathroom before bed time and avoid the occurrence of infection through perineal care and wear cotton underwear.

The scoring system for women′s self-care practices was categorized as follows:
- Done correctly and complete was scored as (2 marks).
- Done correctly and incomplete was scored as (1 mark).
- Done incorrectly or not done at all was scored as (zero).

The total score of women′s self-care practices was calculated. Then, it was categorized as follows:
- Satisfactory practice ≥ 75 %.
- Average practice (50 % to 75%).
- Unsatisfactory practice < 50%.

Tool III: The incontinence severity index (ISI): It was adopted from **(Sharma et al., 2022).** It was used to assess the severity of the stress urinary incontinence among multipara women. It was consisted of two questions:

I. First question: How often do women experience urinary leakage?

The scoring system was categorized as follows:
- Never do not leak urine was scored as (zero),
- Less than once a month was scored as (1mark),
- Few times a month was scored as (2 marks),
- Few times a week was scored as (3 marks)
- Every day and/or night was scored as (4 mark)

II.The second question: How much urine was lost each time?

The scoring system was categorized as follows:
- None, I do not leak urine was scored as (zero)
- Drops was scored as (1mark)
- Small Splashes was scored as (2 marks)
- More was scored as (3 marks).

The total score of women′s incontinence severity index was obtained by multiplying the score of the two questions (ISI Score = I × II) and then categorized as follows:

- Slight stress urinary incontinence =from 1-2 marks,
- Moderate stress urinary incontinence = from 3-6 marks,
- Severe stress urinary incontinence = from 8-9 marks,
- Very severe stress urinary incontinence= 12 marks.

Tool IV: Quality of life questionnaires among women with stress urinary incontinence (QOL):
It was adapted from **(Elbana et al., 2018)** after reviewing the related literature to evaluate the distress and impact of the stress urinary incontinence among the multipara women in three domains: avoidance and limiting behavior (eight items), social embarrassment (five items) and psychosocial impact (nine items):

A. **The avoidance and limiting behavior** included concerns about not reaching the toilet on time, worry about coughing and sneezing, caution when standing up after sitting down, anxiety about locating toilets in unfamiliar places, frequent trips to the toilet, the need for detailed planning due to incontinence, difficulty obtaining a satisfactory night's sleep, and being mindful of what they drink.

B. **Social embarrassment** included being worries about unpleasant odors, the belief that incontinence worsens with age, fear of embarrassment or humiliation due to incontinence, concerns about wetting oneself, and a sense of lacking control over the bladder.

C. **Psychosocial impact** was another significant aspect, included feelings of depression, limitations in leaving the home for extended periods of time, frustration due to the interference of urinary incontinence with desired activities, constant preoccupation with incontinence, a sense of being unhealthy, helplessness caused by urinary incontinence, reduced enjoyment of life due to UI, restricted clothing choices, and concerns about sexual activity.

The scoring system of women′s quality of Life questionnaires regarding Stress Urinary Incontinence (QOL). It was categorized as follows:
- Extremely was scored as = 1 mark,
- Quite a bit was scored as =2 marks,
- Moderately was scored as =3 marks,
- A little was scored as = 4 marks,
- Not at all was scored as =5 marks

The total score level of women′s quality of Life questionnaires regarding Stress Urinary Incontinence (QOL) was calculated. Then, it was categorized as follows:
- Good quality of life ≥ 75%.
- Medium quality of life 60 % - <75%.
- Poor quality of life <60%.

Method

1. **Official approval:** to ensure the study's legitimacy, an official letter outlining the study's purpose was obtained from the Faculty of Nursing at Tanta University and submitted to the administrators of obstetric and gynecological departments at the three settings (Tanta University Hospital, El-Menshawy, and El-Mabara Hospitals) to obtain their approval and cooperation for conducting the study.

2. **Ethical considerations** in the form of maintaining privacy, confidentiality of the collected data, the ability of the studied women to withdraw from the study at any time and the data was solely used for the purpose of the present study were thoroughly taken into account throughout the study. Plus obtaining the Ethical approval from the Scientific Research Ethical Committee of Faculty of Nursing, Tanta University before starting the study (Ethical Code: 318-10-2023).

3. The study tools **(I, II)** were developed by the researcher after reviewing the recent related literature, tool **(III)** was adopted from **(Sharma et al., 2022) and tool (IV)** was adapted from **(Elbana et al., 2018) after** reviewing the recent related literature.

4. **Validity and reliability of the study tools:**
   - The face and content validity of the study tools were assessed through a jury test conducted by five experts in the field of Maternal and Neonatal Health Nursing. This evaluation aimed to determine the relevance and appropriateness of both individual items and the entire instrument in measuring the desired outcomes. The questionnaire's face validity was determined to be 93.16% based on expert opinions, while the content validity index (%) for its items was 94% for knowledge, 91.50% for practice, and 87.7% for QOL questionnaires. In terms of reliability, the questionnaire was tested among pilot subjects, and Cronbach's Alpha coefficients were calculated. The values obtained were 0.845 for knowledge, 0.841 for practice and 0.813% for QOL questionnaires

5. **Pilot study:** Before the actual data collection, a pilot study was conducted on 10% of the sample (10 women) from the aforementioned settings. This pilot study aimed to test the feasibility and applicability of the study tools as well as to estimate the time required to complete them. The data collected from the pilot study and subjects were included in the final study sample as no significant critical changes or modifications were made to the tools.

6. **Data collection:**
-The data collection period for this study took place from October 2023 to the beginning of February 2024. The researchers visited the previous selected settings 3 days/week until the predetermined sample size was achieved.

-The process of nano teaching comprised four phases: assessment, planning, implementation, and evaluation.

A) **The assessment phase** involved inviting women to participate in the study and providing them with a comprehensive explanation of the study's aim and importance to obtain their acceptance and cooperation, as well as their informed consent. A pre-test structured questionnaire was then administered individually to each woman at the beginning of the nano teaching through a 15–20-minute interview.
   - The researcher used: **Tool (I) Multipara women's knowledge regarding stress urinary incontinence structured questionnaire**: **part (1)** Demographic characteristics of the studied multipara women, **part (2)** obstetric history of the women and **part (3)** medical history of stress urinary incontinence among the studied women.
   - In addition, **Tool (I) Part (4):** Assessment of multipara women's knowledge regarding stress urinary incontinence was used to assess women's level of knowledge regarding stress urinary incontinence before implementation of the nano teaching.
   - **Tool II**: **Multipara women's self-care practices regarding stress urinary incontinence** was used to assess multipara women's self-care practices regarding stress urinary incontinence before implementation of the nano teaching.
   - **Tool III**: **The incontinence severity index (ISI)** was used to assess the severity of the stress urinary incontinence problem among multipara women's before implementation of the nano teaching.
   - **Tool IV: Quality of life questionnaires among women with stress urinary incontinence (QOL)** was used to evaluate the distress and impact of urinary incontinence before implementation of the nano teaching.

B) **In the planning phase**, the nano teaching sessions were developed by the researcher based on the findings from the assessment phase and relevant literature. The content of the nano teaching program was presented in three sessions, either individually or in groups, with a range of 5 to 6 participants. These sessions included one theoretical and two practical sessions. Each session lasted between 5 and 15 minutes, with time allocated for discussion.

Goals and objectives for the program were set by the researchers.

a. **The goal of the nano teaching sessions was to:**
   - Enhance women's knowledge as well as practice regarding stress urinary incontinence.

b. **Objectives of the nano teaching sessions:**
   - Determine the effect of nano-teaching on knowledge and practices of multipara women regarding stress urinary incontinence to reduce

the severity of SUI among the studied women and improve their quality of life.

c. Preparation of the content of the nano teaching sessions:

The content of the nano teaching sessions was developed by the researchers and distributed to the women to increase their knowledge and quality of self-care practice regarding stress urinary incontinence. Various teaching methods, power-point, demonstrations and re-demonstrations, were prepared for the women, along with instructional materials included infographics and tutorial videos, to be used during the sessions.
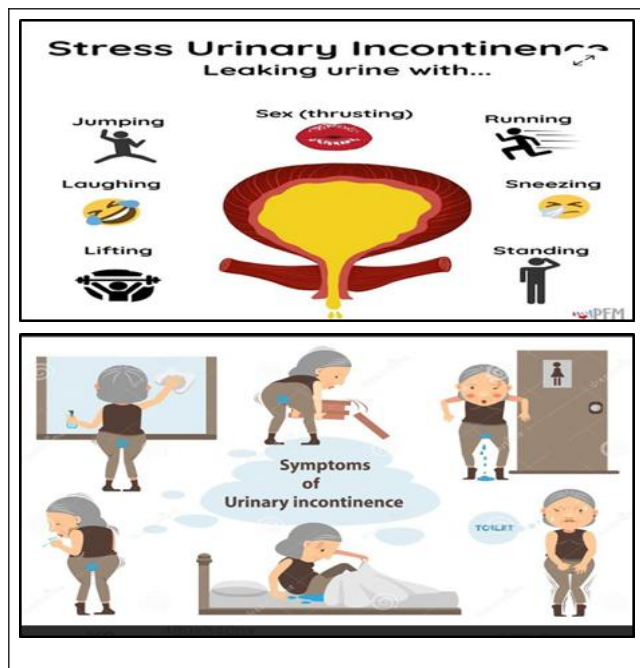
C) Implementation phase:

- **The first session (theoretical session):**
  The aim of this session was to explain the goal and objective of the nano teaching program and also provide the women with knowledge regarding stress urinary incontinence which included definition, causes, signs and symptoms, complications as well as management of stress urinary incontinence. This session lasted 15 minutes.

- **The second session (practical session):** The aim of this session was to enhance women′s skills and practice regarding stress urinary incontinence which included practicing bladder training (the woman is asked to urinate at regular intervals, slowly the time interval is increased); practicing **kegel exercise**: first the women empty the bladder, then hold the contraction for 3 to 5 seconds before relaxing the muscles and counting to 3 to 5 seconds. The women were advised to repeat this step 10 times, three times a day (morning, afternoon, and night), additionally, breathe deeply and relax their bodies while performing this exercise. This session lasted 15 minutes.

- **The third session (practical session):** The aim of this session was to continue enhance women′s practice regarding stress urinary incontinence which

included life style modification: avoid constipation, cough carrying heavy objects; try to maintain a healthy weight; avoid bladder irritants such as caffeine, alcohol and acidic foods; avoid drinking water at bed time; entering bathroom before bed time and avoid occurrence of the infection through perineal care and wear cotton underwear. This session lasted for 10 minutes.

- Each session commenced with providing feedback and demonstrating again the content from the previous session, followed by an introduction to the objectives of the new session.

- After the sessions illustrated colored infographics about SUI were given to the studied women to be used as guide for them.

D) Evaluation phase:

After the implementation of the nano teaching sessions the following was evaluated:

- Women′s knowledge and self-care practice regarding stress urinary incontinence were evaluated using **Tool I part (4) and Tool II**.

- The incontinence severity index was evaluated using **Tool III**.

- Quality of life among women with stress urinary incontinence (QOL) was evaluated using **Tool IV**.

- Comparison was done in relation to women's knowledge, practice, stress urinary incontinence severity as well as women's quality of life before and after implementation of the nano teaching to identify the effect of nano-teaching on knowledge and practices of multipara women regarding stress urinary incontinence.

Statistical analysis:

- The collected data were coded, entered, tabulated and analyzed using SPSS (Statistical Package for Social Science) version 25 (IBM Corporation, Armonk, NY, USA) .

- For quantitative data, the range, mean and standard deviation were calculated. For qualitative data, which describe a categorical set of data by frequency, percentage or proportion of each category, comparison between two groups and more was done using Chi-square test (x^2) .

- For comparison between related more than two means of non-parametric data (before, immediate after and one month after implementation of educational guidelines), Friedman Test (x^2 value) was calculated .

- For comparison between means of two groups of non-parametric data of independent samples, Z value of Mann-whitney test was used. For comparison between more than two means of non-parametric data, Kruskal-Wallis (x^2 value) was calculated. Correlation between variables was evaluated using Pearson's correlation coefficient (r).

Limitation of the study
- Waiting for women until finish their examination.

Results

Table (1): Displayed that more than half of the studied multipara women (52%) were aged from 56- 60 years old with a **mean age ± SD =42.56±5.61** years, more than three quarters of them (78%) were married and more than half of them (51%) were married at age less than 20 years old. The table also showed that more than half of them (58%) can read and write while most of the studied women (85%) were housewives. Regarding women's residence, it is noticed that more than three fifths of them (64%) were living in urban areas, also the most of the studied women (86%) had enough income from their point of view and more than three quarters of them (76%) lived in extended family.

Table (2): Demonstrated that nearly three fifths of the studied women (58%) get pregnant three times, slightly more than one half of them (55%) experienced two previous deliveries, and the private clinic was the most commonly place of antenatal care mentioned by nearly three quarters of the studied women (73%). The table also showed that nearly one half of them (47%) had two antenatal care visits and the majority of them (93%) didn't attend antenatal care classes. Also, the table pointed out that cesarean section was mentioned by nearly three quarters of them (73.4%) as the mode of previous delivery and the majority of them (92% and 93.4% respectively) didn't have previous pregnancy and delivery complications.

Table (3): displayed that more than three fifths of the studied women (67%) had stress urinary incontinence (SUI) for period less than three months. Leakage of urine when the women cough and sneeze or laugh were the most commonly signs mentioned by (70% and 66%) of the studied women respectively. Also, most of them (88%) didn't have any previous treatment of SUI.

Table (4): Illustrated that there was a statistically significant positive improvement among the studied multipara women's knowledge regarding stress urinary incontinence after implementation of the nano teaching compared to pre- nano teaching for all the knowledge items regarding stress urinary incontinence with p <0.001*.

Figure (1): Showed a statistically significant difference between the total score level of knowledge regarding stress urinary incontinence, which improved from 13% among the studied multipara women who had high level of knowledge regarding stress urinary incontinence pre-program to 84% after implementation of the nano teaching.

Figure (2): Revealed that 16% of the studied women with stress urinary incontinence had satisfactory level of practice pre-implementation of the nano teaching which increased to 85% after implementation of the nano teaching.

Table (5): Illustrated that there was a statistically significant positive improvement among the studied multipara women's severity of stress urinary incontinence after implementation of the nano teaching compared to pre- nano teaching with p <0.001*.

Figure (3): Demonstrated that only 3% of the studied women had slight level of stress urinary incontinence pre-implementation, that increased obviously to 75% after implementation of the nano teaching.

Figure (4): Revealed that 6% of the studied women had good quality of life pre-implementation, compared to 78% after implementation of the nano teaching.

Table (6): displayed that there was significant positive correlation between the studied multipara women' total score level of knowledge, practice and quality of life pre and after implementation of the nano teaching. It was also observed that there was significant negative correlation between the studied multipara women' total score level of knowledge, practice and quality of life and severity of urinary incontinence pre and after implementation of the nano teaching.

Table (1): Distribution of the studied multipara women according to their demographic characteristics (n=100).

Demographic characteristics	Studied multipara women (n=100)	
	N	%
Age		
35- < 45	18	18.0
45- < 55	30	30.0
55-60	52	52.0
Range	**35-60**	
(Mean±SD)	**42.56±5.61**	
Marital status		
Married	78	78.0
Divorced	12	12.0
Widowed	10	10.0
Age at marriage		
<20	51	51.0
20-<30	33	33.0
30 -40	16	16.0
Range	**19-40**	
(Mean±SD)	**26.12±3.41**	
Duration of current marriage		
Less than 10 years	12	12.0
10-20 years	43	43.0
More than 20 years	45	45.0
Range	**6-24**	
(Mean±SD)	**11.7±3.9**	
Level of education		
Illiterate	7	7.0
Read and Write	58	58.0
Primary school	6	6.0
Secondary school	16	16.0
University	13	13.0
Occupation		
Working	15	15.0
House wife	85	85.0
Residence		
Urban	64	64.0
Rural	36	36.0
Family income from women view		
More than enough	9	9.0
Enough	86	86.0
Not enough	5	5.0
Type of family		
Nuclear	24	24.0
Extended	76	76.0

Table (2): Distribution of the studied multipara women according to their obstetric history (n=100).

Obstetrical history of the women	Studied multipara women (n=100)	
	N	%
Gravidity		
Twice	31	31.0
Three times	58	58.0
Four times	11	11.0
Parity		
Twice	55	55.0
Three times	45	45.0
Attendance of antenatal care		
Yes	97	97.0
No	3	3.0
Place of antenatal care		
Government hospital	7	7.0
Private hospital	1	1.0
Private clinic	73	73.0
Maternal and child health care	16	16.0
Number of antenatal care visits		
1	22	22.0
2	47	47.0
3	26	26.0
4	2	2.0
Attendance of antenatal care classes		
Yes	6	6.0
No	94	94.0
If the answer is yes, who is giving the course?	**(n=6)**	**(n=6)**
Doctor	1	16.6
Nurse	5	83.4
Mode of previous delivery	(n=75)	
Normal vaginal delivery	20	26.6
Cesarean section	55	73.4
Previous pregnancy complications		
Yes	8	8.0
No	92	92.0
If the answer is yes, mention the complications?	**(n=8)**	**(n=8)**
Hyperemesis gravidarum	3	37.5
Pre-eclampsia	2	25.0
Eclampsia	1	12.5
Bleeding	2	25.0
Previous delivery complications	(n=75)	
Yes	5	6.6
No	70	93.4
If the answer is yes, mention the complications?	**(n=5)**	**(n=5)**
Intrapartum hemorrhage.	1	20.0
Fetal distress	3	60.0
Umbilical cord prolapse	1	20.0

Table (3): Distribution of the studied multipara women according to their medical history of stress urinary incontinence (n=100).

Medical history of stress urinary incontinence	Studied multipara women (n=100)	
	N	%
Duration of stress urinary incontinence		
Less than three months	67	67.0
3 month- 1year	23	23.0
More than one year	10	10.0
Signs of stress urinary incontinence		
Leakage of urine when the women (more than one answer*)		
Cough or sneeze	70	70.0
Laugh	66	66.0
Bend over	23	23.0
Lift something heavy	45	45.0
Exercise	10	10.0
Have sex	16	16.0
All of the above	41	41.0
Previous treatment of stress urinary incontinence		
Yes	12	12.0
No	88	88.0
If the answer is yes, mention	(n=12)	(n=12)
Medication	11	91.7
Exercise	1	8.3
Surgery	0	0.0

* More than one answer

Table (4): Distribution of the studied multipara women′s according to their knowledge regarding SUI before and after implementation of the nano teaching (n= 100).

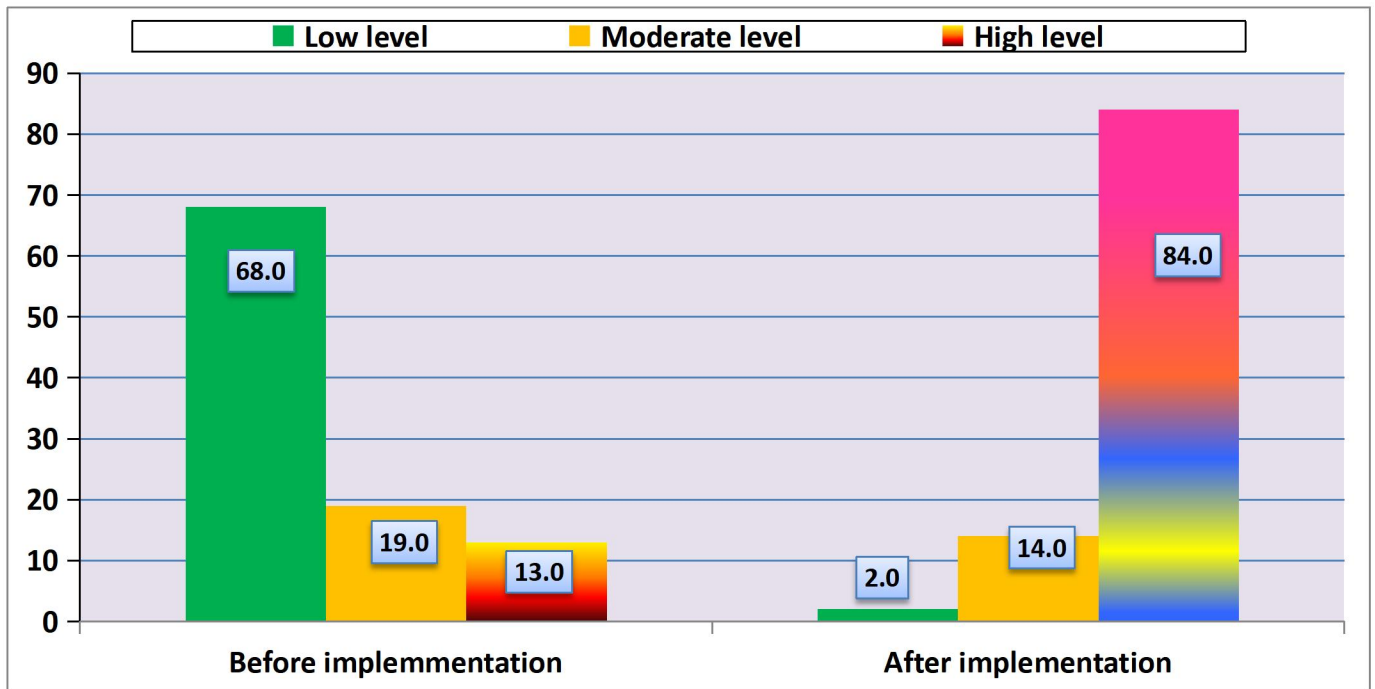| Multipara women′s knowledge regarding stress urinary incontinence		Before Implementation		After Implementation		Chi-square	
		N	%	N	%	X^2	P-value
Definition of SUI	Incorrect	64	64.0	2	2.0	133.176	<0.001*
	Correct & incomplete	24	24.0	15	15.0		
	Correct & complete	12	12.0	83	83.0		
Signs and symptoms of SUI	Incorrect	70	70.0	1	1.0	139.237	<0.001*
	Correct & incomplete	20	20.0	13	13.0		
	Correct & complete	10	10.0	86	86.0		
Complications of SUI	Incorrect	67	67.0	3	3.0	136.226	<0.001*
	Correct & incomplete	21	21.0	17	17.0		
	Correct & complete	12	12.0	80	80.0		
Management of women with SUI	Incorrect	73	73.0	4	4.0	143.155	<0.001*
	Correct & incomplete	16	16.0	12	12.0		
	Correct & complete	11	11.0	84	84.0		

*Statistically significant (P<0.05)

Figure (1): Distribution of the studied multipara women′s according to their total score level of knowledge regarding SUI before and after implementation of the nano teaching (n= 100).
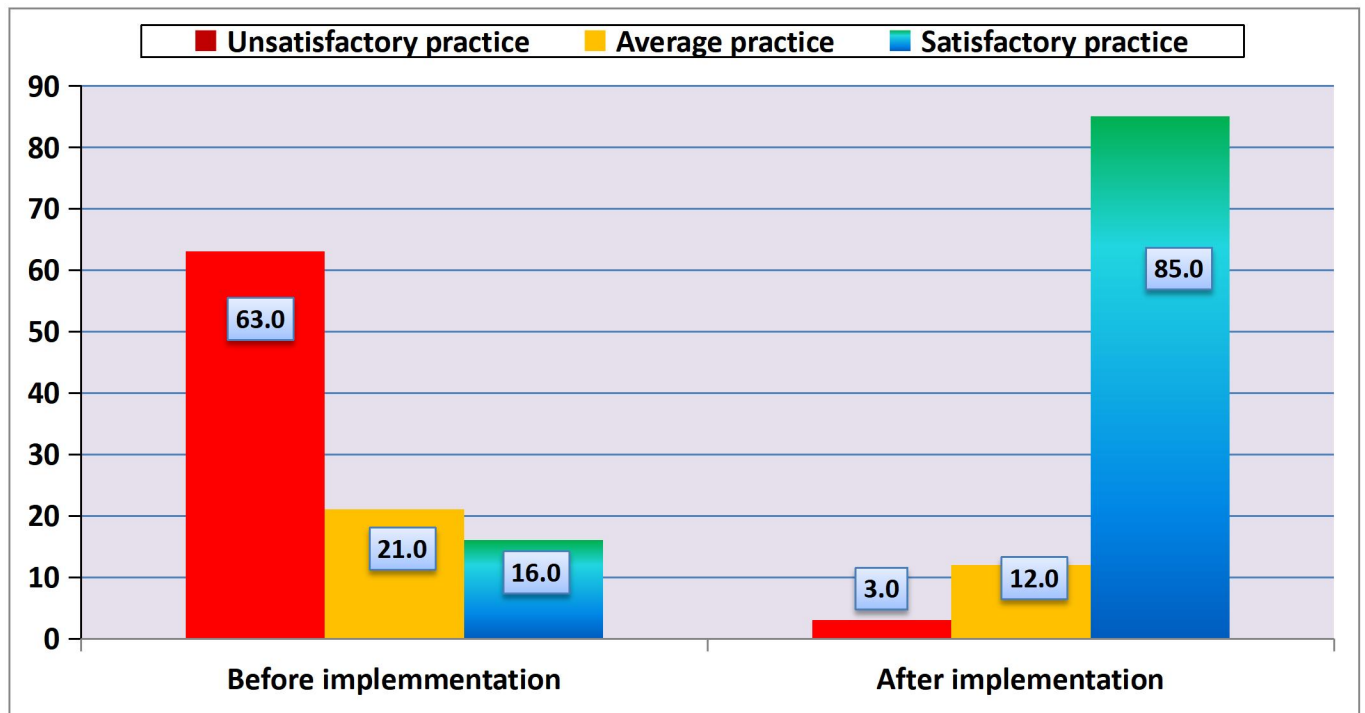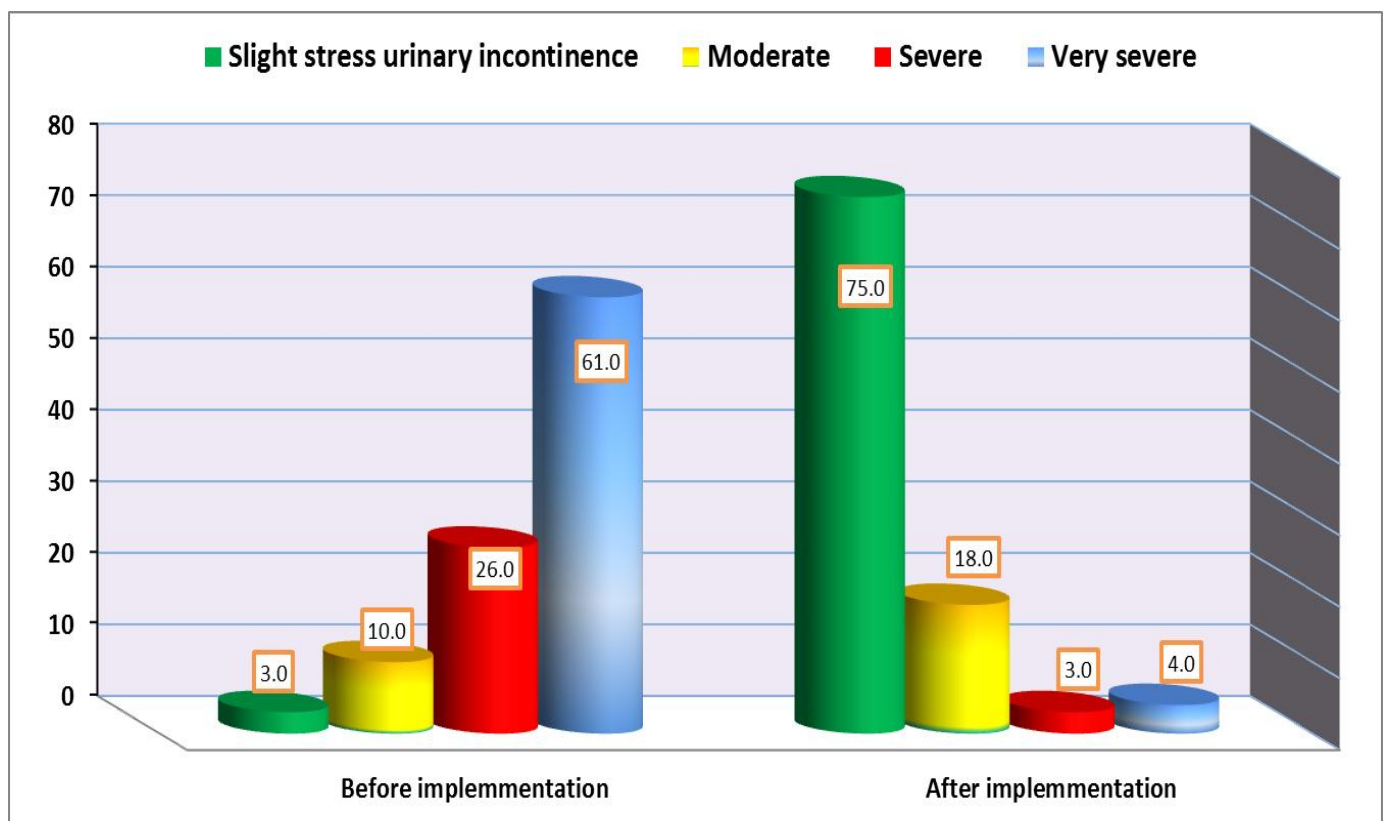

Figure (2): Distribution of the studied multipara women′s according to their total score level of self-care practices regarding stress urinary incontinence before and after implementation of the nano teaching (n= 100)

Table (5): Distribution of the studied multipara women′s according to their severity of stress urinary incontinence before and after implementation of the nano teaching (n= 100).

The incontinence severity among the studied women (n=100)	Before Implementation		After Implementation		Chi-square	
	N	%	N	%	X²	P-value
How often do you experience urinary leakage						
Never, I do not leak urine	1	1.0	25	25.0		
Less than once a month	3	3.0	41	41.0		
A few times a month	6	6.0	14	14.0	147.537	<0.001*
A few times a week	15	15.0	7	7.0		
Every day and/or night	75	75.0	13	13.0		
How much urine do you lose each time						
None, I do not leak urine	5	5.0	47	47.0		
Drops	9	9.0	42	42.0		
Small Splashes	19	19.0	4	4.0	108.045	<0.001*
More	67	67.0	7	7.0		

***Statistically significant (P<0.05)**

Figure (3): Distribution of the studied multipara women′s according to their total score level of their severity of stress urinary incontinence before and after implementation of the nano teaching (n= 100).
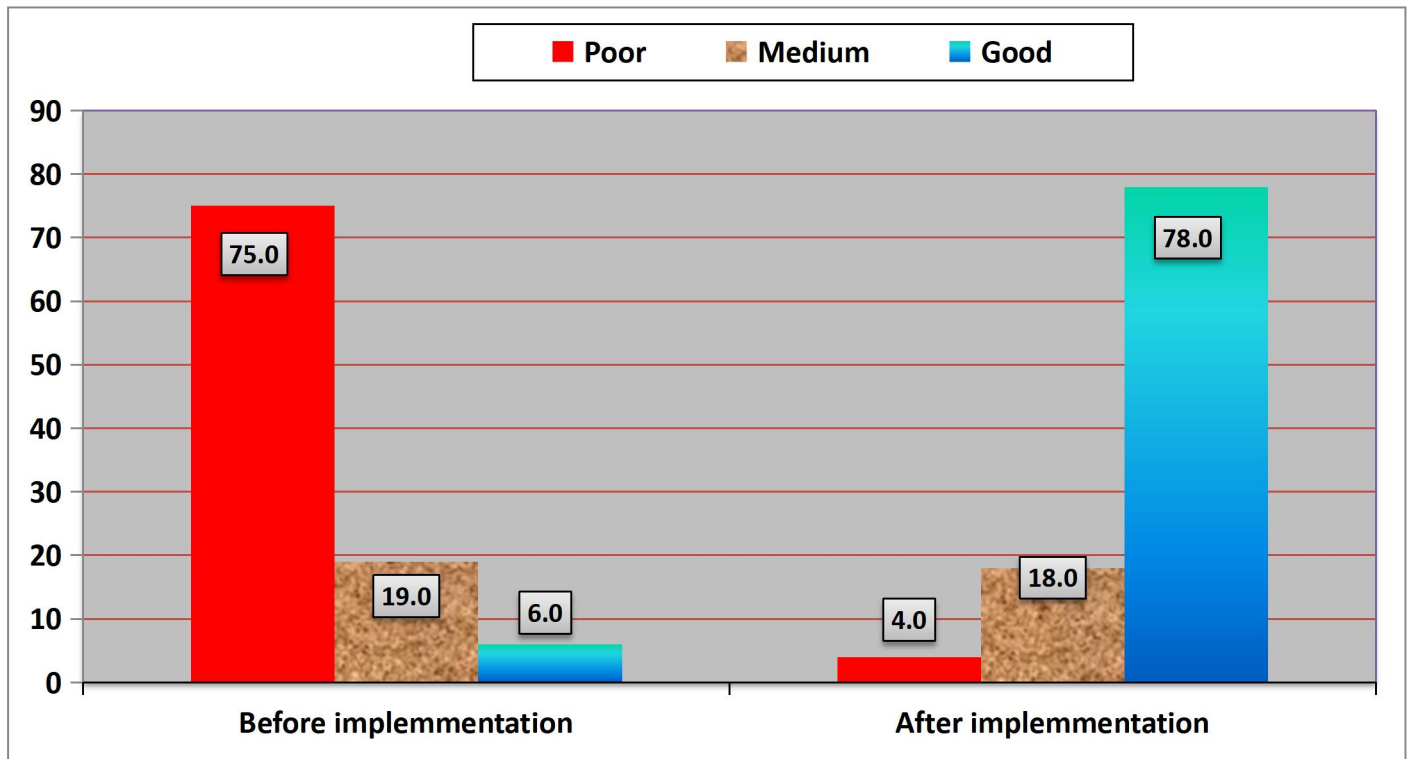
Figure (4): Distribution of the studied multipara women′s according to their total score level of quality of life with urinary incontinence before and after implementation of the nano teaching (n= 100).

Table (6): Correlation between the studied multipara women′s total knowledge, practice, quality of life and urinary incontinence severity scores before and after implementation of the nano teaching (n= 100).

Variable	Knowledge		Practice		Severity of urinary incontinence	
	r	P-value	R	P-value	r	P-value
Before implementation						
Practice	0.427	<0.001*				
Urinary incontinence severity	-0.169	0.015*	-0.430	<0.001*		
QOL	0.198	0.035*	0.284	<0.001*	-0.129	0.201
After implementation						
Practice	0.356	<0.001*				
Urinary incontinence severity	-0.332	<0.001*	-0.377	<0.001*		
QOL	0.230	0.004*	0.323	<0.001*	-0.234	0.003*

*Statistically significant (P<0.05)

Discussion

Stress urinary incontinence is a prevalent dysfunction that affects a varying percentage of individuals across different populations, irrespective of gender and age. This condition negatively impacts the quality of life and gives rise to a range of physical and psychological burdens. Physical complications associated with stress urinary incontinence include urinary tract infections, local perineum infection, and perineal skin irritation caused by ammonia in the urine. Psychological and social consequences include anxiety, anger, shame, guilt, depression, embarrassment, and low self-esteem, which can lead to social isolation.

(Wang et al., 2023; Scharp et al., 2023) Unfortunately, scarce research exists regarding stress urinary incontinence. So, this study supposes to provide an effective knowledge and intervention to help multipara women with stress urinary incontinence to manage their multi dimension problems.

Concerning demographic characteristics of the studied multipara women, the current study founded that more than half of them were aged from 55- 60 years old with a mean age ± SD= 42.56±5.61 years, as well as can read and write and most of them were housewife. This result agreed with the finding of a study done by **Elattar et al., (2022)**, entitled "educational program for multipara women with stress urinary incontinence", who illustrated that more than half of multipara women were in the age group of 55 to 60 years old, more than two fifth of them read and write and more than two thirds of them were housewives. Additionally, in study done by **Helmy et al., (2022)** entitled "the effect of video assisted teaching program on premenopausal women knowledge and practice regarding pelvic floor muscle exercises", who mentioned that nearly three quarters of the studied sample were housewives.

On contrast, Elbana et al., (2018), who studied the effect of urinary incontinence on quality of life and self-esteem of postmenopausal women, demonstrated that more than half of studied women were aged less 50 years old with a mean age ± SD=50.6±3.5 years. This discrepancy may be related to the different of setting where the study was conducted.

As regards to obstetric history of the studied multipara women, it was observed that nearly three fifths of the women were pregnant three times and nearly three quarters of them mentioned cesarean section as a mode of previous delivery. This study agreed with the finding of a study done by **Elbana et al., (2018)**, who revealed that more than three fifths of their subject were pregnant from one to three times. However, it was in contrast regarding the mode of previous delivery where nearly one half of their sample had normal vaginal delivery.

Concerning the medical history of the studied multipara women, the finding of the present study revealed that more than three fifths of

them had stress urinary incontinence (SUI) for period less than three months. **This study contradicts with Elbana et al., (2018)**, who illustrated that more than half of the sample had stress urinary incontinence for period from one to three years.

In relation to the studied multipara women's total level of knowledge regarding SUI, the current study stated that there was significant improvement in the total level of knowledge after implementation of the nano teaching with a statistically significant difference. This finding was in harmony with a study done by **Elattar et al., (2022)**, who reported that there was significant improvement of multipara women's total knowledge regarding SUI after implementation of the educational program.

Additionally; **Tarukallo et al., (2018)** conducted a study about "The Effect of Postpartum Pelvic Floor Muscle Training on Pelvic Floor Muscle Strength among Postpartum Women with SUI", demonstrated that women's overall knowledge about stress urinary incontinence improved following the implementation of the training program. From the researchers' point of view low level of knowledge regarding SUI before implementation of the nano-teaching may be attributed to the fact that the majority of the studied multipara women had low level of education, which affects negatively on their knowledge and self-care practices.

Furthermore, the increase in knowledge levels observed after the implementation of the nano-teaching program may due to the effect of the nano-teaching sessions, also, due to the participants' enthusiasm for learning and their desire to know and understand more about SUI, how this problem has a profound effect on their life and how to deal with it. This finding indicates that the nano-teaching program had a positive impact on enhancing the knowledge of the studied multipara women.

On contrast, **Worlanso and Shimray (2020)** who assessed the quality of life and health seeking behavior among the women with postpartum urinary incontinence, demonstrated that the majority of the women had satisfactory knowledge level. **Furthermore**, a study done by **Sidik et al., (2021)** who studied "effectiveness study of pelvic floor muscle training among incontinent women", emphasized that more than half of the studied women had satisfactory knowledge level before the program. This discrepancy in the current study may be related to the different educational level among the studied women.

In relation to the studied multipara women's total level of practices regarding SUI, the finding of the present study revealed that the minority of the studied women had satisfactory level of practice before implementation of the nano

teaching which significantly improved among the majority of them after implementation of the nano teaching. This result could be elucidated by the lack of knowledge about SUI among the studied multipara women which reflected negatively on their practice. On the other hand, implementing the nano-teaching sessions provided the studied women with the opportunity for training and re-demonstrating kegel exercise and improving their practice. This result was in proportion with a study done by **Sidik et al., (2021)**, who emphasized that less than half of the subjects had satisfied level of practice.

Additionally, **Helmy et al. (2022)** revealed that a high percentage of premenopausal women had limited experience with pelvic floor muscle exercises prior to the implementation of the video-assisted teaching program, which improved after its implementation. Moreover, a study conducted by **Debbarma (2021)** on the impact of pelvic floor muscle exercises on stress urinary incontinence among menopausal women in selected areas of Bhubaneswar, Odisha, found a statistically significant difference between the pretest and posttest scores among the experimental group regarding their level of practice.

Concerning severity of stress urinary incontinence, the finding of the present study revealed that there was a statistically significant positive improvement regarding the severity of stress urinary incontinence among three quarter of the studied multipara women after implementation of the nano teaching compared to pre- nano teaching. This may be attributed to the effect of regular performance of bladder training and kegel exercise that has proven to be an effective treatment for SUI with excellent results for reducing the frequency of urinary incontinence and relieving its symptoms **(Abd El-Aty and Hassan, 2021)**. In addition, the trial of the studied multipara women to modify their lifestyle after implementing the nano teaching sessions.

This result agreed with the findings of **Elattar et al., (2022)**, who illustrated that there was statistically significant improvement of the multipara women's total severity of SUI after implementation of the educational program.

Another study done by **Stafne et al., (2020),** entitled "antenatal pelvic floor muscle training and urinary incontinence", found that the majority of women had improvement regarding the severity of stress incontinence after implementation of the training program.

The current study also, revealed a significant improvement in the quality of life among the studied multipara women after implementing the nano teaching compared to pre-implementation. This could be related to the significant improvement of the severity of SUI after implementing the nano teaching. This in agreement with **Abd El-Aty and**

Hassan, 2021 who studied Effect of Kegel Exercise Training Program on Improving Quality of Life among Women with Urinary Incontinence, who concluded that there was positive improvement in quality of life after implementing Kegel exercise.

As regard the correlation between studied multipara women′ total knowledge and practice, The findings of the present study indicated a significant positive correlation between the level of knowledge and practice among the multipara women before and after the implementation of the nano teaching. These findings aligned with the study done by **Vasconcelos and Costa (2021),** who examined the frequency and factors associated with urinary incontinence among pregnant women and found a positive statistically significant correlation between total knowledge and total practice. Furthermore, in a study done by **Helmy et al., (2022)** there was a significant positive correlation between the knowledge and practice with statically significant differences as (p <0.05).

From the researchers' point of view, this strong relation between women' knowledge and their practices were highly expectable; whereas, their knowledge reflected on self-care practices which improved after implementing the effective nano teaching program regrading SUI. The finding of the present study contradicted with the finding of a study done by **Kebede and Kassaye (2020)** who studied the "Urinary Incontinence Prevalence during Pregnancy," they found that there was no statistically significant correlation between total knowledge and total practice.

Conclusion

The findings of the present study revealed that significant improvement was observed among the studied multipara women′s knowledge and practice after implementation of the nano-teaching regarding stress urinary incontinence. Furthermore, the severity of SUI was significantly reduced among the studied multipara women after the nano teaching resulted in a significant positive improvement in their quality of life. Thus, the research hypothesis and sub- hypothesis had been achieved after implementation of the nano-teaching.

Recommendations

Based on the findings of the present study, the following recommendations were proposed:

1. Health education about healthy life style should be provided for multipara women who are at risk for SUI. Planning and developing training programs for multipara women with SUI in order to improve update and refresh their knowledge and qualify their practices.
2. Holding monthly meetings for multipara women with SUI for follow up and exchange ideas and discuss the difficulties which face them.
3. Replication of the study under different circumstances, including larger sample sizes

and different settings, in Egypt, to ensure the generalizability of the study findings.

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