



## Assessment of Surgical Treatment Outcome of Women Patients with Stress Urinary Incontinence Managed in Jimma University Medical Center, Southwest Ethiopia

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**Received:** June 22, 2020

**Published:** July 30, 2020

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### Abstract

**Background:** Stress Urinary incontinence (SUI) is a common problem in women and with appropriate diagnosis stress urinary incontinence can most often be treated. Jimma University Medical Centre (JUMC) has been performing surgical treatment since the past four years and it was crucial to determine the clinical characteristics and outcomes of surgical treatment done for women with stress urinary incontinence JUMC.

**Objectives:** To determine outcomes of surgical treatment of women with stress urinary incontinence, and associated factors in Jimma University Medical Centre (JUMC).

**Methods:** Hospital based cross sectional study was conducted among 44 female patients with stress urinary incontinence admitted to gynecology ward and underwent surgical treatment in Jimma University Medical Centre (JUMC) over a period of 1 year and 7 months from 1 January/2018 to 30 July/2019 G.C. The collected data was entered into Epidata version 4.1, and then it was exported to SPSS (Version 20.0) for statistical analysis.

**Result:** The study showed that the age of the patients ranged from 14 to 65 years with mean of 35 ( $\pm$  13) years, 24 (54.5%) patients were house wife, 19 (43.2%) divorced, 33 (75%) were not sexually active, 30 (68.2%) multiparous and 30 (68.2%) patients gave birth by vaginal route. Forty two (95.5%) patients were from rural areas and 27 (61.4%) patients were having stress urinary incontinence for less than 36 months, 17 (38.6%) patients were having stress urinary incontinence for 36 months and above. Thirty nine (88.6%) patents were treated with pubovaginal sling and 36 (81.8%) patients on discharge were continent to urine and were cured of SUI after surgical treatment.

**Conclusion and Recommendations:** In this study the majority of patients had lived with stress urinary incontinence and were treated with Pubovaginal Sling and high success rate was achieved with vulvovaginal Sling procedure.

**Keywords:** Stress Urinary Incontinence; Pubovaginal Sling; Surgical Outcome

### Abbreviations

BMI: Body Mass Index; HRQOL: Health Related Quality of Life; IIQ: Incontinence Impact Questionnaire; ISD: Intrinsic Sphincter Defect; JUMC: Jimma University Medical Centre; LUTS: Lower Urinary Tract Symptoms; MMK: Marshall MarchettiKranz; MUS: Mid Urethral Sling; NHANES: National Health and Nutrition Examination

Survey; PFMT: Pelvic Floor Muscle Training; POR: Prevalence Odds Ratio; POPQ: Pelvic Organ Prolapse Quantitation system; PVR: Postvoid Residual Volume; PVS: Pubovaginal Sling; RCTC: Randomized Controlled Trial; SISTEr: Stress Incontinence Surgical Treatment Efficacy Trial; SUI: Stress Urinary Incontinence; TOT: Trans Obturator Mid Urethral Sling; TVT: Tension-free Vaginal Tape; UDI:

Urogenital Distress Inventory; UUI: Urgency Urinary Incontinence; UDS: Urodynamic Studies; VVF: Vesicovaginal Fistula

## Introduction

### Background

Stress urinary incontinence (SUI) is caused by loss of urethral and bladder neck support and intrinsic sphincter defect, which leads to involuntary leakage of urine with increases in intraabdominal pressure, which can be caused by activities such as sneezing, coughing, exercise, lifting, and position [1]. Women with SUI most often report an avoidance of lifting heavy objects and may even stop jogging/exercise for fear of involuntarily leaking urine [2]. Leakage is due to impaired pelvic supports or, less commonly, failure of urethral closure; the latter intrinsic sphincter deficiency occurs with trauma and scarring from anti-incontinence surgery or with severe urethral atrophy [3]. About 29 up to 75% of urinary incontinence is attributable to stress urinary incontinence (SUI). The commonest type of incontinence in younger women, but also occurs in older women. About 10% of all women experience urine leakage at least weekly, whereas 25-45% have occasional leakage with SUI accounting for 50% of all incontinence [4]. Key risk factors include age, obesity, smoking, medications that relax the urethral sphincter, pregnancy, childbirth menopause, chronically increased abdominal pressure; chronic cough, constipation, occupational and prior pelvic surgeries [5].

Stress urinary incontinence is most common complaint in every part of the world. It causes a great deal of distress and embarrassment, as well as significant costs, to families friends and societies [6,7]. Female urinary incontinence has a significant negative impact on women quality of life and on that of her family and friends. In reality, women always choose not to leave their home for fear and shame of losing urine in public, feeling wet and smelling, not finding a bathroom when they need to change clothes or their protective pad [8]. SUI exerts a significant negative impact on health related quality of life (HRQOL) and is an important contributor of anxiety and depression [9]. SUI is usually elicited through the performance of the cough test, with the patient supine. A positive cough test carried out with an empty bladder, patient in supine position, tends to indicate an intrinsic urethral sphincter deficiency. Urethral hypermobility is mostly assessed by eyeball observation. Classically it can also be diagnosed by performing a Qtip test, in which a cotton swab test, was undertaken historically to assess urethral mobility and is abnormal if a >30 degree change occurs

on straining. Post void Residual Volume; this volume is routinely measured during incontinence evaluation. After a woman voids, the post void residual (PVR) volume may be measured by transurethral catheterization or with a handheld sonographic bladder scanner. In these instances, or if a scanner is not available, transurethral catheterization may be used to confirm residual bladder volume. A large PVR volume may often reflect one of several problems including recurrent infection, urethral obstruction from a pelvic mass, or neurologic deficits. In contrast, a normally small PVR volume is often found in those with SUI. After continence surgery, PVR measurement is a helpful indicator of a patient's ability to completely empty her bladder [10,11].

For women with stress-predominant urinary incontinence undergoing surgical treatment, outcomes were no different 1 year later in those screened by UDS compared with those evaluated by a simple office evaluation. The office testing included demonstrable leakage during examination, urine analysis without infection, and PVR < 150 mL [12].

### Statement of the problem

Urinary incontinence (UI); which is the complaint of any involuntary leakage of urine, is a common symptom that affects women of all ages, with a different range of severity and nature. Even though not life-threatening, incontinence may seriously influence physical, psychological and social wellbeing of affected individuals. Its impact on the families and careers of women with UI may be profound, and the resource implication for the health care service is considerably high. In women between the ages of 45 and 70 years, the primary type of incontinence is stress urinary incontinence which describes involuntary leakage of urine that is associated with increases in abdominal pressure. Stress urinary incontinence has several repercussions in their emotional state, in sexual intercourse incontinence and it causes significant financial burden; in economic terms this translates to significant costs with an estimated annual direct cost of \$32 billion in the United State.

Treatment options include pelvic floor muscle training, pessaries, pharmacotherapy, and surgery. With advances in surgical techniques and in the safety of anaesthesia, women are more inclined to have surgical management of their stress urinary incontinence. The standard surgical treatments for stress urinary incontinence include; Burchcolposuspension, Marshall-MarchettiKrantzretropubicurethropepy, retropubicmidurethral sling and pubovaginal

sling. In most continence surgery the benefit of restoring continence is often at the expense of developing new symptoms, or exacerbating existing lower urinary tract symptoms.

Jimma Medical Center has started female Urogynecology and Pelvic Reconstructive Surgery fellowship program in 2016. There is no published information on outcome of surgical treatment for women who were admitted with stress urinary incontinence in Jimma Medical Centre and underwent surgical treatment.

Following the recent WHO international consultation on incontinence, it was stated that: there is now recognition that outcome from surgery for stress incontinence is not simply an issue of cure of the stress incontinence. The primary objective of our study is to determine the overall success of the surgical procedures in achieving urinary continence and voiding function. The secondary purpose of this study is to establish postoperative complications.

### Significance of this study

Jimma University Medical Centre has been providing surgical treatment service on urinary incontinence since the past four years and it was crucial to determine the clinical characteristics and outcomes of surgical treatment done for women with stress urinary incontinence JUMC. Knowledge of patients with stress urinary incontinence admitted to gynecology ward in Jimma Medical Centre on local demographic data, risk factors of stress urinary incontinence at the time of anti-incontinence surgery and outcomes of surgical treatment, will help in outlining the plans for early detection, diagnosis and management of stress urinary incontinence. The information in the present study might be considered as a baseline data of stress urinary incontinence in Jimma University Medical Centre. To the further knowledge of the investigators, there was no previous study done on outcomes of surgical treatment for stress urinary incontinence and factors associated with outcomes of surgical treatment in the study area. Hence the results of this study may serve as the cornerstone finding that creates insight among health care planners and administrators. Further Zonal and Jimma town health care sectors and stakeholders including health bureau and other concerned bodies may consume the findings while planning health care interventions. As this study will provide base line information regarding outcomes of surgical treatment done for stress urinary incontinence, as it helps other researchers for studies to be conducted in the future.

### Literature Review

Stress urinary incontinence (SUI) is a common health problem among women - approximately 12 - 55% of women will experience SUI at some point of their life. The most prevalent type of urinary incontinence (UI) was the stress UI (SUI), ranging between 13% and 50% [13,14]. The prevalence of UI increases with age, among 57 patients aged 25 to 40 years, SUI occurred in 12 women (21%), and in a subgroup of 56 patients aged 41 to 55 years, SUI occurred in 16 women (28%). The problem of stress urinary incontinence often concerned respondents aged  $\geq 41$  years and it took 1 to 19 years, an average of 5.4 years [15]. A follow up study of 38 women who had undergone fistula repair found only 2 (5%) women were divorced while suffering from a fistula, 27 (71%) women remained married and sexually active, seven (26%) were amenorrhoeic. Thirty-four (92%) were farmers, two (5%) were domestic workers and one (3%) was a potter [16]. The impact of pregnancy and childbirth on stress urinary incontinence is complex [17]. In another study most of the women had more than 2 deliveries and only 12.4% did not have children. In addition, 57.9% with children gave birth vaginally and 14.5% had both C-section and vaginal deliveries. Of the participants, 24% of those who had children had episiotomies and 17% had hysterectomies [18]. In a Comparative Clinical Study of 30 patients with stress incontinence their age ranged from 28 to 60 years; 25 patients developed stress incontinence in post-menopausal period, 3 following hysterectomy and 2 had their symptoms following delivery [19]. In one analytical study on incontinence data from the demographic and health surveys on socioeconomic background characteristics in the six countries show significance in the expected direction [20].

Systematic review studies identified the three most common associated risk factors of urinary incontinence as being BMI, childhood enuresis, and high impact exercising [21]. The prevalence of urinary incontinence (UI) in nulliparous women of childbearing age has been reported to be 10 - 15%. The overall prevalence of UI was 16.7% and it increased more than five-fold from 9.7% in the youngest women with a body mass index (BMI)  $< 25$  kg/m<sup>2</sup> to 48.4% among the oldest women with a BMI  $\geq 35$  kg/m<sup>2</sup> [22]. A study has found that 39% of the patients with preoperative SUI were cured after POP surgery. However, de novo SUI appeared in 22% of the patients without preoperative SUI [23]. In one Large Population-based Cohort study on Stress Urinary Incontinence Surgery after Pelvic Organ Prolapse Repair, a total of 1504 women

(3.6%) had a subsequent SUI procedure at a mean time of 1.4 years after their original POP repair [24]. Open retropubic colposuspension is associated with high rates of objective and subjective cure, especially in the long term. After 5 year, approximately 70% of women remained 'dry' [25]. In prospective observational study of 655 women randomized into Stress Incontinence Surgical Treatment Efficacy Trial, only a minority reported prior incontinence surgery (15%) or were found to have pelvic organ prolapse stage III/ IV (17%), during baseline assessment for the trial. The continence rates were lower in the Burch urethropexy group than in the fascial sling group as evidenced by the rates at five years: 24.1% compared to 30.8%, respectively. Fewer women in the fascial sling group experienced surgical retreatment compared to women in the Burch urethropexy group 2% vs. 12% [26]. In one study, urinary incontinence interfered with marital and sexual life in 7.5 - 33% of patients [27]. In 2001, Groutz employed the pubovaginal sling (PVS) procedure in 67 patients with genuine SUI and the patients were considered cured if there was no urinary incontinence in a 24-hour voiding diary and a negative pad test. Overall, 67% achieved a cure and 33% achieved improvement [28]. At one year after pubovaginal sling surgery, 82.1% of patients were cured of stress urinary incontinence. The majority (85.1%) of patients did not develop postoperative voiding dysfunction [29]. Vaginal sling procedures are indicated in the management of stress urinary incontinence secondary to both intrinsic sphincteric deficiency (ISD) and urethral hypermobility resulting in anatomical incontinence. Several long-term reviews have demonstrated that pubovaginal slings are among the most versatile and durable of the surgical approaches for stress incontinence [30]. In one study who underwent sling surgery for SUI, urinary retention occurred in 40% of patients [31]. In a multicenter, randomized trial to compare physiotherapy and midurethral-sling(MUS) surgery in women with stress urinary incontinence, a total of 65 adverse events occurred in 41 (9.8%) of 417 women; all adverse events were related to surgery. Intraoperative bladder perforation and vaginal epithelial perforations were successfully repaired during surgery. Three women had a recorded blood loss of 500 ml or more. One woman needed reoperation to loosen the synthetic sling because of persistent voiding difficulty [32].

A non-randomized clinical trial, 135 women with urge or mixed urinary incontinence were operated. The duration of the surgery lasted between 58 and 145 min, with a mean of 85 min.

The mean blood loss was less than 50 ml. but in 2 patients with a bleeding of the sacral venous plexus the blood loss was 1.2 and

1.5 liters [33]. At the end of pubo-vaginal sling operation for stress incontinence a catheter will be inserted via the urethra to rest the bladder for 24 hours. Patients stay in hospital may be up to 5 days [34]. A Hospital based cross sectional study on characteristics and repair outcome of patients with Vesicovaginal fistula managed in Jimma University teaching Hospital, Ethiopia, 71% of repair was done under spinal anesthesia, when compared with most studies in other African countries [35].

### Conceptual frame work

Stress Urinary Incontinence (SUI) is a common medical condition. It involves the involuntary loss of urine that occurs when physical forces on the bladder are increased during physical movement of the body. Examples of this include but are not limited to loss of urine with coughing, sneezing, exercising, or picking up heavy objects. SUI can interfere with quality of life. It may affect day to-day decisions about social activities. Women may be embarrassed about their bodies and hesitant to talk about urinary leakage to loved ones and friends. SUI can affect intimate relationships and may limit sexual interaction. Any of these issues can result in feelings of isolation and hopelessness. Knowledge of patients with stress urinary incontinence admitted to gynecology ward in Jima Medical Centre on local demographic data, quality of life, the severity of stress incontinence at the time of anti-incontinence surgery and outcomes of surgical repair, will help in outlining the plans for early detection, diagnosis and management of stress urinary incontinence [1] (Figure 1).

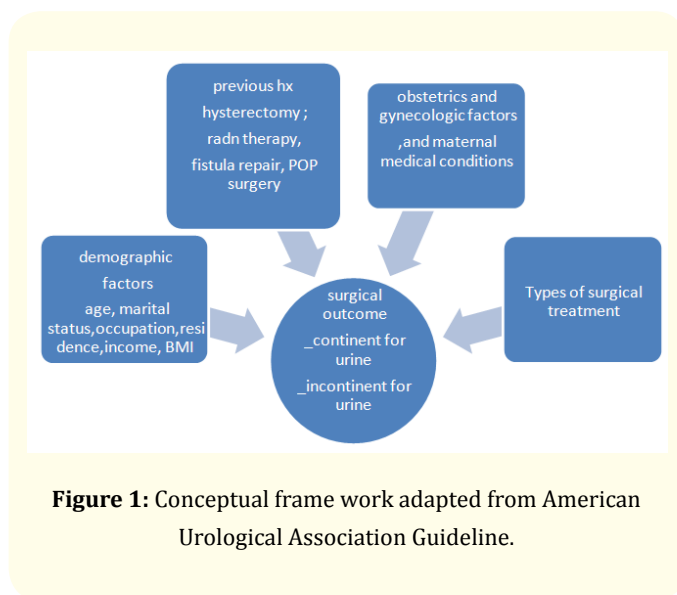


Figure 1: Conceptual frame work adapted from American Urological Association Guideline.

## Objectives of the Study

### General objectives

The main objective of the study was to determine outcomes of surgical treatment of women with stress urinary incontinence, and risk factors associated in JUMC.

### Specific objectives

- To assess risk factors of urinary incontinence,
- To identify the types of surgical treatment done for women with SUI in JUMC, and
- To determine the surgical outcome of stress urinary incontinence on urinary symptoms.

## Methods and Materials

### Study area

The study was conducted at Jimma University Medical Centre which is one of the higher institutions in Ethiopia. It is located in Jimma town which is about 335 kms southwest of Addis Ababa. And the main campus is situated to the east of the town at about 3kms from the down town, Jima Municipality and 4kms before reaching to King Abajifar Palace. Jimma University Medical Centre (JUMC) which is part of Jima University (JU), established in 1930, is located in the main campus. It is a referral hospital which provides services for approximately 9000 in patient and 80,000 outpatient attendances a year with a very wide catchment population of about 15 million people in southwest Ethiopia. The services given by the hospital includes clinical, pathology and laboratory, pharmacy and other services. It is attended by patients of different socio demographic characteristics.

In Ethiopia there are few health facilities including Jimma University Medical Centre (JUMC) performing stress urinary incontinence treatment with five urogynecology and reconstructive surgery fellows. The Hospital has been performing surgical treatment since the past four years and it is crucial to determine the clinical characteristics and outcomes of surgical treatment done for women with stress urinary incontinence JUMC.

### The study period

The Study was conducted from January 1/2018 to July 30/2019 G.C.

### Study design

Across sectional study of all patients with stress urinary incontinence admitted to gynecology ward and under gone surgical treatment within 1 year and 7 months.

### Population

- **Source population:** All patients with stress urinary incontinence admitted to gynecology ward and underwent surgical treatment.
- **Study population:** All patients with stress urinary incontinence who underwent surgical treatment from January 1/2018 to July 30/2019 G.C.

### Inclusion criteria and exclusion criteria

#### Inclusion criteria

- All cases with symptoms of stress urinary incontinence as defined by a positive response to any of the following three pelvic floor distress inventory items were included:
  - Experienced urine leakage related to coughing, sneezing, or laughing
  - Experience urine leakage related to walking, running
  - Experienced urine leakage related to lifting or bending over.
- Those Completed data collection per protocol, including written informed consent.

#### Exclusion criteria

All cases with mixed urinary incontinence were excluded by history and physical examination.

### Data collection

#### Data collection tool and technique

The questionnaire was initially prepared in English then translated to the local language, Amharic and Afaan Oromo, by professional and it also retranslated back to English in order to check consistence. Data was collected in two phases using questionnaire from the case notes of the participants' chart, which was filled up from the entry of the patient to the hospital till her surgery, and postoperative period until discharge.

### Data collectors

The data was collected by trained midwifery nurses in collaboration with data clerks in the liaison office. The principal investigator gave orientation to the data collectors before the collection period and closely supervised during the data collection.

### Data quality control

To assure the data quality, one day training was given for two data collectors. The data collection was supervised by the principal investigator. The quality of data was assured by properly designed and pretested questionnaires' among a small number of women who underwent surgical repair for SUI in JUMC prior to month of data collection to assess its clarity, length, completeness and consistency. Every day the computed questionnaires were reviewed and checked for completeness and relevance by principal investigator and the necessary feedback was offered to data collectors in the next morning before the actual procedure.

### Variables

#### Independent variables

- Socio-economic and demographic characteristics: age, education level, occupation, marital status, place of residence, income of the family in birr per month, religion and ethnicity.
- Maternal medical, Obstetrics and Gynecologic factors: medical illnesses, mental illnesses, Smoking, COPD, obesity, connective tissue disorders, parity at event and current respectively, number of living children, and mode of delivery.
- Previous history of pelvic surgeries done for POP or hysterectomy, stress treatment and fistula repair.

#### Dependent variables

Surgical treatment outcome of SUI.

#### Operational definitions

- The index patient: Defined as an otherwise healthy female patient who has elected surgical therapy for the correction of SUI.
- Surgical outcome: Assessed after the index surgery on discharge from JUMC, based on history and a cough stress test.
- A cough stress test: Positive; if there is observation of leakage of urine with coughing.

- A cough stress test: Negative; if there is no observation of leakage of urine with coughing.
- Continent: If there is no urinary incontinence on discharge based on history and negative cough stress test.
- Incontinent: If there is urinary incontinence on discharge based on history and positive cough stress test.
- Pubovaginal Slings (PVS): Are the most commonly used sling material, offering the advantage of maximum bio-compatibility, during SUI surgery. They are a strips of rectus muscle fascia obtained through a suprapubic incision and placed beneath the bladder neck or urethra to support and close the opening when abdominal stressors cause pressure on the pelvic floor.
- Burch Colposuspension: Another common surgery for SUI. It is also called a "retropubic suspension" and refers to a procedure that involves making an incision on the lower abdomen and suspending the neck of the bladder to a point behind ("retro") the pubic bone ("pubic").
- Family income: It was measured on daily income of workers based on 2013 millennium development report which was used to classify workers in developing country as extremely poor, moderately poor, near poor, developing middle class and developed middle class based on their daily income of (<\$1.25, ≥\$1.25 and \$2, ≥2 \$ and \$4, ≥\$4 and <\$13 and >\$13) dollars respectively.

#### Data processing and analysis

The collected data was entered into Epidata version 4.1, and then it was exported to Statistical Package For Social Sciences (SPSS) (Version 20.0) for statistical analysis. The univariate analysis such as proportions, percentages, ratios, frequency distributions and appropriate graphic presentations as well as measures of central tendency and measures of dispersion was used for describing data. Continuous variables expressed as mean and standard deviation values.

#### Ethical assurance and utilization and dissemination of the results

Ethical clearance was obtained from Jimma University ethical committee and a support letter was requested from the University hospital to the department for retrieval of individual medical records of patients. All the information obtained from the records was anonymous. Honesty was maintained during data collection analysis and interpretation. Written consent was obtained from the patient.

## Results

### Patients socio-demographic characteristics of patients with SUI who underwent surgical treatment from January 1/2018 to July 30/2019 G.C

#### Socio-demographic characteristics of patients

A total 44 patients with stress urinary incontinence underwent surgical treatment out of elective gynecologic surgeries during the study period.

The age of the patients ranged from 14 to 65 years with mean of 35 (±13) years. Thirty five (79.5%) patients were age 19 - 49 years. Twenty four (54.6%) patients were divorced/separated. Forty two (95.4%) patients were house wife. Concerning their residence 42 (95.5%) patients were from rural areas. Thirty eight (86.4%) patients have no formal education. Based on income per family per day, 23 (52.5%) patients earned < \$ 1.25 per day.

Thirty eight (86.4%) patients were having BMI between 18.5 to 24.9 Kg/m<sup>2</sup> (Table 1).

Variables		Frequency	Percent (%)
Age in category	<19	2	4.5
	19-49	35	79.5
	>49	7	16
Marital status	Currently married	19	43.2
	Single	1	2.3
	Divorced/Separated	24	54.6
Occupation	House wife	42	95.4
	Employed	1	2.3
	Others	1	2.3
Residence	Urban	2	4.5
	Rural	42	95.5
Education- al status	No formal education	38	86.4
	Read and write	1	2.3
	Primary	4	9.1
	Above secondary	1	2.3
Family Income	<\$ 1.25	23	52.3
	≥\$1.25 and \$2	11	25
	≥2 \$ and \$4	8	18.2
	≥\$4 and <\$13	2	4.5
Body Mass Index (Kg/m <sup>2</sup> )	< 18.5	5	11.3
	18.5-24.9	38	86.4
	25-29.9	1	2.3

**Table 1:** Socio-economic and demographic characteristics of patients who underwent surgical treatment for stress urinary incontinence from January 1/2018 to July 30/2019 G.C, In JUMC.

### Distribution of maternal, obstetrics and gynecologic characteristics and previous pelvic surgeries among patients with SUI who underwent surgical treatment from January 1/2018 to July 30/2019 G.C, in JUMC

Thirty (68.2%) were multiparous of which 2 (6.7%) were grand multipara and 1 patient was great grand multipara (binary logistic regression done, p-value > 0.5). Seven (15.9%) patients were in postmenopausal state (binary logistic regression done, p-value > 0.5), and 37 (84.1%) patients were in premenopausal state when they developed urinary stress incontinence. Forty one (93.2%) patients were having no identified risk factors, 1 patient was having diabetes mellitus, 1 patient was having childhood enuresis, and 1 patient was having pelvic trauma as a risk factors for stress urinary incontinence other than menopause, pregnancy and child birth. Eleven (25%) patients were sexually active and 33 (75%) patients were not sexually active. Among patients who were not sexually active, 25 (75.8%) patients said they have no partner, 4 (12.1%) patients said they have no interest in sex and 4 (12.1%) patients said they have no sexual activity due to urinary incontinence. Regarding the mode of delivery 30 (68.2%) patients were delivered vaginal route, 8 (18.2%) patients were delivered instrumental, 5 (11.3%) delivered by abdominal route of which 3 by hysterectomy for uterine ruptures and 2 delivered through cesarean section and 1 patient has no history childbirth. Twenty seven (61.4%) patients were having stress urinary incontinence for less than 36 months, 17 (38.6%) patients were having stress urinary incontinence for 36 months and above. About history of previous pelvic surgery, 24 (54.5%) patients had previous history of pelvic surgery (binary logistic regression done, p-value > 0.5).

Among patients with previous pelvic surgery 19 (79.2%) patients were for vesicovaginal fistula.

Eighteen (75%) of patient underwent surgery with in the last 4 years (Table 2).

### Distribution of the surgical and post-operative factors among patients with SUI who underwent surgical treatment from January 1/2018 to July 30/2019 G.C

Most of the surgery was done on vaginal route 42 (95.6%). Thirty nine (88.6%) patients were treated with pubovaginal sling procedure. Forty three (97.7%) patient were given spinal anesthesia. Forty three (97.7%) patients underwent surgery with no difficulty while 1 patient had surgical difficulty with iatrogenic bladder injury. For 15 (34.1%) patients the bladder catheter kept for 1 day (24 hrs) after surgery (Table 3).

Variables		Frequency (n = 44)	Percent (%)
Parity at the event	Nullipara	1	2.3
	1	13	29.5
	≥11	30	68.2
Is she in menopause when she develops SUI symptoms?	Yes	7	15.9
	No	37	84.1
Is there any identified risk factors for SUI other than menopause, pregnancy and child birth?	Yes	3	9.1
	No	41	93.2
If yes, specify identified risk factor?	Pelvic trauma	1	33.4
	Diabetes mellitus	1	33.3
Are you sexually active?	Yes	11	25.0
	No	33	75.0
Mode of delivery if any	Spontaneous	30	68.2
	Vaginal delivery		
	Instrumental	8	18.2
	Abdominal	5	11.3
Duration of SUI (months)	<36	27	61.4
	≥36	17	38.6
Was there previous pelvic surgery?	Yes	24	54.5
	No	20	45.5
The previous pelvic surgery for	SUI	3	12.5
	Fistula repair	19	79.2
	UVP	2	8.3
Type of surgery done	Fistula repair	19	79.2
	POP surgery	2	8.3
	PVS	3	12.5
When was it done in years?	0-4	18	75
	5-10	6	25

**Table 2:** Distribution of maternal, obstetrics and gynecologic characteristics and previous pelvic surgeries among patients with SUI who underwent surgical treatment January 1/2018 to July 30/2019 G.C, In JUMC.

Variables		Frequency (n = 44)	Percent (%)
Surgical approach	Vaginal	42	95.4
	Abdominal	2	4.6
What is the type of anti-incontinence surgery done?	Burch Colpo-suspension.	2	4.5
	Pubovaginal Sling	39	88.6
	Kelly Stitch	3	6.8
Type of anesthesia	Spinal	43	97.7
	Combined	1	2.3
Procedure with surgical difficulties	Yes	1	2.3
Duration of post-operation bladder catheterization (in days)	1 day	15	34.1
	2 days	13	29.6
	7 days	7	15.9
	14 days	9	20.4

**Table 3:** Distribution of the surgical and post-operative factors among patients with SUI who underwent Surgical Treatment from January 1/2018 to July 30/2019 G.C, In JUMC.

**Distribution of surgical treatment outcomes among patients with SUI who underwent surgical treatment from January 1/2018 to July 30/2019 G.C. in JUMC**

Concerning the surgical treatment outcome, 36 (81.8%) patients on discharge were continent to urine and cured of SUI after surgical treatment, and 8 (18.2%) patients on discharge were incontinent to urine and not cured of SUI after surgical treatment. One patient had intraoperative bladder injury, 1 patient had post-operative fever greater than 38 degree Celsius and 1 patient had post-operative urinary retention > 24hrs and relived by pubo-vaginal sling release. About the duration of surgery 32 (72.8%) patients the duration of surgery was between 60-120 minutes, 10 (22.7%) patients the duration of surgery was 60 minutes and below and 2 (4.5%) patients the duration of surgery was greater than 120 minutes. Regarding the blood loss 21 (47.7%) patients were having blood loss between 150 ml - 300 ml, 3 (6.8%) patients were having blood loss of more than 150 ml (Table 4).



Variables		Frequency (n = 44)	Percent (%)
Patient discharged with improvement	Yes	36	81.8
	No	8	18.2
Was there iatrogenic bladder injury?	Yes	1	2.3
	No	43	97.7
Fever >38°C more than one day	Yes	1	2.3
	No	43	97.7
Urinary retention > 24 hours	Yes	1	2.3
	No	43	97.7
Intervention for urinary retention	PVS release	1	2.3
Duration of the surgery (minutes)	<60	10	22.7
	60-120	32	72.7
	>120	2	4.5
Amount of blood loss (ml)	<150	20	45.5
	150-300	21	47.7
	>300	3	6.8

**Table 4:** Distribution of Surgical Treatment Outcomes among patients with SUI who underwent Surgical Treatment from January 1/2018 to July 30/2019 G.C, In JUMC.

## Discussion

In this study, the majority, 35 (79.5%) patients with stress urinary incontinence (SUI) were between 19 - 49 years of age. This study is different from the previous studies where the prevalence of urinary incontinence increases with age. Our findings may be ascribed to high parity and associated child birth injury at young age as most common risk factor for stress urinary incontinence. In our study stress urinary incontinence symptoms took 2 months to 15 years, a mean of 4 year which is similar to a previous study where it took 1 to 19 years, an average of 5.4 year [15]. The majority, 42 (95.4%) patients were housewife, 24 (54.6%) divorced/separated and 33 (75%) were not sexually active. In another previous community-based long-term follow up of women undergoing obstetric fistula repair in Gimbe Adventist Hospital, in rural Western Ethiopia found 38 women who had undergone fistula repair found only 2 women were divorced while suffering from a fistula, 27 (71%) women remained married and sexually active, and 34 (92%) were farmers [16].

Most, 30 (68.2%) patients were multiparous and majority, 30 (68.2%) patients gave birth vaginal route which is similar to a previous study in which most of the women had more than 2 deliveries and majority, 57.9% with children gave birth vaginally [18]. In this study, the majority, 37 (84.1%) patients were in premenopausal state and were having pregnancy and child birth, as a commonest risk factors for stress urinary incontinence. In a previous Comparative Clinical Study of 30 patients with stress incontinence their age ranged from 28 to 60 years; majority 25 patients developed stress incontinence in post-menopausal period. This finding might be explained by the fact that most of the patients in the current study were in reproductive age group and majority were multiparous as a major risk factor [19].

In our study, most, 42 (95.5%) patients were from rural areas which is similar to a previous study done on incontinence data from the Demographic Health Survey analytical studies in Ethiopia, Malawi and Uganda showed that rural women are significantly more likely than urban women to report fistula symptoms in all countries which is similar to the current study. In this study the majority, 38 (86.4%) patients have no formal education and the majority, 23 (52.5%) earned less than \$ 1.25 per day which is similar from another previous study on incontinence data from the Demographic Health Survey analytical studies in Ethiopia, Malawi and Uganda; showed increasing education and wealth, women are significantly less likely to report fistula symptoms [20].

The majority, 38(86.4%) patients were having BMI between 18.5 to 24.9 Kg/m<sup>2</sup>. From a previous study it was 9.7% in the youngest women were having a normal body mass index. Our finding can be attributed to the majority being young age women [22].

In this study the majority, 24 (54.5%) patients had previous history of pelvic surgery, among the types of previous pelvic surgery the majority, 19 (79.2%) patients underwent fistula repair procedure and most, 18 (75%) of patients the surgery was done with in the last 4 years. In another prospective observational study, only a minority reported prior incontinence surgery (15%) or were found to have pelvic organ prolapse stage III/ IV (17%), during baseline assessment for the trial. The findings of the current study might be explained by the presence of high obstetric fistula prevalence compared to other developed regions of the world [26].

Regarding sexual activity, the majority 25 (75.8%) patients said no partner and not sexually active. In a previous another study, urinary incontinence interfered with marital and sexual life in 7.5 - 33% of patients. The current finding is higher than the previous study and might be explained by most patients being divorced and widow [27].

In this study the majority, 39 (88.6%) patients were treated with pubovaginal sling procedure. In a similar way in a previous study PVS procedure employed in 67 patients with genuine SUI [28]. In this study the majority, 36 (81.8%) patients were discharged with successful surgical treatment hence improved urinary continence. In a similar way in another previous study, at one year after pubovaginal sling surgery, 82.1% of patients were cured of stress urinary incontinence [29]. Concerning the route of surgery, most, 42 (95.6%) of the surgery was done on vaginal route. In a similar way in a previous study which demonstrated pubovaginal slings as among the most versatile and durable of the surgical approaches for stress incontinence were done on vaginal route [30].

In this study the majority, 43 (97.7%) patient did not develop postoperative urinary retention, 1 (2.3%) patient had acute urinary retention after pubovaginal sling surgery and the retention was relieved by sling release. In a similar way in another previous study, the majority (85.1%) of patients did not develop postoperative voiding dysfunction. Only 5.6% of those who did develop postoperative voiding dysfunction required surgical sling release. In another previous one study who underwent sling surgery for SUI, urinary retention occurred in 40% of patients which higher than the current study [29,31].

About intraoperative blood loss, 21 (47.7%) patients were having blood loss between 150 ml - 300 ml, 20 (45.5%) patients were having blood loss less than 150 ml and 3 (6.8%) patients were having blood loss of more than 300 ml. In a similar way in a previous study showed, a total of 65 adverse events occurred in 41 (9.8%) of 417 women. Intraoperative bladder perforation and vaginal epithelial perforations were successfully repaired during surgery. Three women had a recorded blood loss of 500 ml or more [32]. In this study the duration of surgery lasted between 23 and 180 minutes with mean of 88 minutes, the majority, 32 (77.3%) patients the duration of surgery was between 60-120 minutes. In this study the majority, 21 (47.7%) patients were having blood loss between 150-300 ml. with mean blood loss of 205 ml. In another nonran-

domized clinical trial, 135 women who were operated with urge or mixed urinary incontinence, the duration of the surgery lasted between 58 and 145 min, with a mean of 85 min. The mean blood loss was less than 50 ml. In another study, a pubovaginal sling procedure is usually performed as an out-patient procedure in less than 30 minutes, in whatever way, an overnight stay may be necessary. The mean duration of surgery and mean blood loss are higher than the previous study and these might be explained by the presence of higher previous pelvic surgeries that might have increased the operation time and intraoperative blood loss [33]. Regarding bladder catheterization, the majority, 15 (34.1%) patients the bladder catheter kept for 1 day (24 hrs) after surgery, in a previous study following Fascial Sling operation for stress incontinence a catheter will be inserted via the urethra to rest the bladder for 24 hours some patients stay in hospital may be up to 5 days. In our study there were, 9 (20.4%) patients the bladder catheter kept for 14 days after surgery which may be due most patients at the index surgery were having scar from previous pelvic surgery [34]. In this study the majority, 43 (97.7%) patient the surgery done under spinal anesthesia. In a similar way in another previous study done in Ethiopia, 71% of surgical repair was done under spinal anesthesia [35].

### Strengths of the Study

Strength: The study has utilized different methods of data collection to increase the validity of the study and the result.

### Limitations of the Study

This result tells about the outcome at discharge from the hospital and patient didn't come for subsequent follow up at 3 and six months.

### Conclusion

In this study, majority of the patients are in the reproductive age group, house wife, divorced, from rural areas and have no formal education, lived with SUI for long, and were not sexually active. The identified risk factors were pregnancy and child birth injury, menopause, diabetes mellitus, and pelvic trauma. A number of patients were having previous pelvic surgery for Vesicovaginal fistula after prolonged labor and delivery. The majority of patients were treated with Pubovaginal Sling procedure and high success rate was achieved with no significant complications.

## Recommendations

### To Zonal Health Office

Awareness creation of the community on urinary incontinence and its treatment is necessary to avoid unnecessary delay in treatment and patients suffering from untreated SUI.

### TO Jimma University Medical Centre

Disseminate health information through media about SUI and availability of surgical treatment in JUMC.

### Information sheet and mothers Consent form (English)

#### Information sheet

Good morning?/Good afternoon? My name is Dr. Chuchu Aregal am final year of obstetrics and gynecology resident at of Jimma University. I am conducting a study on outcomes of surgical repair of women with stress urinary incontinence in JUMC for my partial fulfillment of the requirements for the master degree in Obstetrics and Gynecology. You are chosen to participate in the study. I want to assure you that all of your answers will be kept strictly secret. I will not keep a record of your name or address. You have the right to stop the interview at any time, or to skip any questions that you don't want to answer. Your participation is completely voluntary but your experiences could be very helpful toas this study will provide base line information regarding outcomes of surgical repair done for stress urinary incontinence, and factors associated with outcomes of surgical repair and it helps other researchers for studies to be conducted in the future.

If you agree to participate in the study, interview will take about 30 minutes to complete. Do you have any questions?

Consent form

Do you agree to be interviewed?

Yes                      No

May I begin the interview now? To be signed by interviewer: I certify that I have read the above consent procedure to the participant.

Signed: \_\_\_\_\_

## Questionnaire

Jimma University Medical Centre department of Obstetrics and Gynecology, Questionnaire on Stress Urinary Incontinence.

Date \_\_\_\_\_

### Questions

#### Section 1: Socio demographic characteristics

No.	Question	Coding
101	Age in year	
102	Marital status	1. Currently married 2. Single 3. Widowed 4. Divorced /Separated
103	Occupation	1. Housewife 2. Civil servant (employee) 3. Farmer 4. Merchant 5. Others (specify).....
104	Residence	1. Urban 2. Rural
105	Educational status	1. No formal education 2. Read and write only (literate basic) 3. Primary (Grade 1-8) 4. Secondary (Grade 9-12) 5. Above secondary (Grade >12) (specify).....
106	Income of the family in birr per month	
107	Body Mass Index (BMI)	

**Section 2: Maternal obstetrics and gynecologic characteristics**

No.	Question	Coding
201	Parity at event and current respectively	And _____
202	Duration of stress urinary incontinence symptom (in months)	_____
203	Mode of delivery if any	1. Vaginal delivery 2. Instrumental 3. C/S 4. Hysterectomy
204	Is she in menopause when she develops stress urinary incontinence symptoms?	1. Yes 2. No
205	Is there any identified risk factors for stress urinary incontinence other than menopause, pregnancy and child birth?	1. Yes 2. No
206	If yes, specify identified risk factor?	1. Age 2. Obesity 3. Childhood enuresis 4. COPD 5. Pelvic trauma 6. Diabetes mellitus
207	Are you sexually active?	1. Yes 2. No
208	If no, what is/are the reason?	1. No partner 2. No interest 3. Urinary incontinence 4. Pain

**Section III: Previous history of pelvic surgeries**

No.	Questions	Coding
301	Was there previous pelvic surgery?	1. Yes 2. No
302	If yes, was the surgery done for?	1. Stress urinary incontinence, 2. Vesicovaginal fistula 3. Pelvic organ prolapse
303	When was it done in years?	_____
304	If the previous surgery was for stress urinary incontinence, what is/are the type of the surgery?	_____
305	If previous surgery was for vesicovaginal fistula, what is/are the type of the surgery?	_____
306	If the previous surgery was for pelvic organ prolapse, what is/are the type of the surgery?	_____

**Section IV: Types of surgical treatment for stress urinary incontinence**

No.	Questions	Coding
401	Approach of surgery	1. Vaginal 2. Abdominal 3. Both
402	What is the type of anti-incontinence surgery done?	1. Retropubicurethropexy (Burch) 2. Puvovaginal Sling 3. Retropubicmidurethral sling (TVT or TOT) 4. Fistula repaired 5. Kelly Stitch
403	Type of anesthesia	1. Spinal 2. General 3. Combined 4. Local
404	Procedure’s duration in minutes	.....
405	Blood loss (ml)	.....
406	Procedure with surgical difficulties	1. Yes 2. No
407	Duration of post-operation bladder catheterization (in days)	.....

**Section V: Surgical treatment outcome**

501	Patient discharged with improvement	1. Yes 2. No
502	Patient discharged with no improvement	1. Yes 2. No
503	Does the patient have complications/symptoms related to the surgery?	1. Yes 2. No
504	Was there iatrogenic bladder injury?	1. Yes 2. No
505	Fever >38°C more than one day	1. Yes 2. No
506	Post-operative Hemorrhage	1. Yes 2. No
507	Urinary retention > 24h	1. Yes 2. No
508	If yes to the above question, how was it relieved?	Specify_____

Data collector's name \_\_\_\_\_ Sign \_\_\_\_\_

Date \_\_\_\_\_

**Thank you, for your cooperation!**

**Assurance of principal investigator**

The undersigned agrees to accept responsibility for the scientific ethical and technical conduct of the research project and for provision of required progress reports as per terms and conditions of the Health Science Institute in effect at the time of grant is forwarded as the result of this application.

Name of the resident: \_\_\_\_\_ Date: \_\_\_\_\_ Signature: \_\_\_\_\_

Approval of advisors Name of the first advisor: \_\_\_\_\_ Date: \_\_\_\_\_ Signature \_\_\_\_\_

Name of the second advisor: \_\_\_\_\_ Date \_\_\_\_\_ Signature \_\_\_\_\_

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