

## Fecal Incontinence Frequency, Severity and its Impact on Quality of Life of Elderly Patients

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### Abstract:

**Background:** Fecal incontinence is a physically and psychologically stigmatized health problem that affects millions of people, especially those over the age of 65 years. It has a deleterious impact on geriatric patients' quality of life. **Aim:** Assess fecal incontinence frequency, severity and its impact on quality of life of elderly patients. **Method:** A descriptive design was used. The study was conducted at the outpatient clinics of Mansoura University hospitals affiliated to Mansoura University A purposive sample of 89 fecally incontinent elderly patients in the previously mentioned settings. Data collected over a period of 6 months from first of October 2019 to the end of March 2020. **Tools:** Four tools were used; Structured Interview Sheet, Katz and Akpom Scale, the Revised Faecal Incontinence Scale, and The Fecal Incontinence Quality of Life Questionnaire **Results:** The study results revealed that a total of 304 elderly patients were asked from whom 126 are females and 178 are males. 89 elderly patients with fecal incontinence were documented, which represents a frequency of 29.3% of the total studied subjects. The presence of neurologic and endocrine diseases is the independent predictors of fecal incontinence in elderly with AOR=1.8 and 0.5; respectively. A significant correlation between the mean score of the fecal incontinence severity and mean score of quality of life related four domains; lifestyle, coping behavior, depression and embarrassment ( $p<0.001$ ). **Conclusion:** Fecal incontinence was more prevalent among females than in males and highly affected the quality of life of fecal incontinent elderly patients **Recommendation:** Development of health education program for elderly patients and their caregiver about fecal incontinence, planning of pelvic floor muscle rehabilitations training program for females' elderly patients **Keywords:** Fecal incontinence, frequency, Severity, Quality of life, Elderly patients.

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### I. Introduction:

Human Fecal incontinence (FI) is one of geriatric giants which is chronic disorder that leads to functional disability and deterioration of elderly persons' quality of lives. Its risk of occurrence increases within age and it doesn't pose direct threats to life, but it is difficult to be treated, reduces social-contacts and increases the elderly's dependence on his caregivers. FI a physically, socially, psychologically a stigmatized medical problem that affects millions of people especially those over the age of 65 years<sup>1</sup>

It affects women than men during earlier years, delay in seeking treatment by most of elderly patients through mention secondary symptoms rather than acknowledge incontinence leads to an undervalue of FI occurrence. Although most of elderly patients can achieve significant betterment in symptoms through earlier diagnosis and proper treatment, they attempt to self-manage the symptom in secrecy from others due to embarrassment.<sup>2</sup> Fecal incontinence affects up to 7%–15% of individuals worldwide and is a medico-social problem that affect the quality of life enormously. Its prevalence and etiology vary according to the studied populations.<sup>3</sup>

The pathological causes of FI are often multifactorial, diminished anorectal sensation, weaken pelvic-floor muscle, anal sphincter muscle dysfunction, altered stool consistency and immobility playing significant roles.<sup>4</sup> Several associated factors are associated with FI in geriatric patients including fecal loading, stool loose, anorectal incontinence, multiple comorbidities, impaired physical and cognitive function.<sup>5</sup> Moreover; FI results commonly of nerve or muscle injury that tracks the normal aging process of the pelvic muscles of elderly patient. FI isn't an imperative aging consequence, it may be an indication of underlying hidden serious problems such as Alzheimer disease, rectal prolapse, constipation or fecal impaction.<sup>6</sup>

Fecal incontinence in elderly is associated with stool delivery or consistency alterations, diminishing of rectum compliance, anorectum's sensation alterations or diminished sphincter's function. Also, common major neurological and cognitive diseases in older age will contribute to fecal incontinency such as dementia that impairs mobility and diminishes awareness and control of voiding. Parkinson's disease which slows gut's transition

time and contributes to constipations. Additionally, strokes and some other causes of mobility impairment similarly may contribute to increasing risk of constipation. Activities of daily living deficiencies, e.g. feeding, grooming and toileting, have been also correlated to an increased risk of FI. Constipation is also common in the older adults and manifests with incontinency overflow.<sup>7</sup>

Moreover; fecal incontinence has a great psychologic impact and an infinite effect on geriatric patients' quality of life (QOL) and increase caregiver's burdens. It may have a deleterious impact on QOL domains; physical, emotional and social health respectively.<sup>8</sup> Elderly patients perceive FI as threats to their privacy and acceptance that will affect their social relationships; through lack of socialization and social isolation related to perceived fear of public accidents, fear and shame about disclosing.<sup>9</sup> FI affects many daily living activities like; sleeping pattern, working and social activities. Also, it can be embarrassing, distressing, and result in low self-esteem, reduced intimacy and sexual relation.<sup>10</sup>

FI is underestimated problem due to reluctance of geriatric patients to report symptoms or seek help. Lack of understanding of the available management strategies can impede their treatment and reduce its impact on their QOL.<sup>11</sup> The gerontological nurse role includes comprehensive assessment of anorectal problems, bowel habits and continence especially in those having fecal urgency, chronic diarrhea, diabetes mellitus (DM), constipation, frequent urinary tract infections (UTI), urinary incontinence, or neuro-muscular diseases. The role of gerontological nurse will be appear in assessing the fecal incontinence severity, understanding its pathophysiology, and guiding patients to the proper treatment modalities. This is achieved by comprehensive geriatric assessment, physical examinations, health history in addition to the laboratory tests which aims to determine the cause of FI. The most effective treatment options are lifestyle modifications, a scheduled toileting training program, Kegel exercise, biofeedback and dietary habits regimens.<sup>12</sup> The latest information regarding FI health problem, that there have been no available studies on FI in Egypt among elderly are scare and its impact on QOL wasn't previously addressed. This study was conducted to assess the frequency, severity of fecal incontinence and assess fecal incontinence frequency, severity and its impact on quality of life of elderly patients.

### **Significance of the study**

Fecal incontinence is associated with a great psychosocial and economic burden on elderly patients' life. It's one of the greatest causes of institutionalization among elderly in the last decades of life, despite its prevalence and harmful impact on patients and their caregivers, fecal incontinence remains understudied in clinical research. Further research still needed to clarify the main aspects related to fecal incontinence among elderly patients.

### **Aims of the study:**

- Assess fecal incontinence frequency, severity and its impact on quality of life of elderly patients.

## **II. Subjects and Method**

**Design:** Descriptive design was used in this study to fulfill the aims of this study.

**Setting:** This study was carried out at the medical, neurological and GIT specialties out-patients clinic of Mansoura university hospitals affiliated to Mansoura city.

### **Subjects:**

The study involved a purposive sample of 89 FI elderly patients were recruited consequently from 304 elderly patients admitted in the previously mentioned settings within 6 months period; based on inclusion criteria, aged sixty years and above, diagnosed of FI, both sexes, able to communicate and comprehend, available at the time of data collection at the selected settings and also ready to participate in this study, elderly patients diagnosed with mental diseases were excluded.

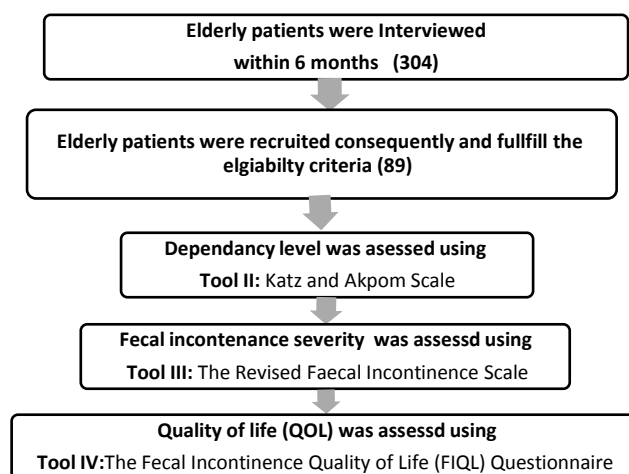


Figure (1): Research framework flowchart

### Tools

Four tools were used to collect the necessary data

#### Tool I; Structured Interview Sheet:

This tool was developed by the researcher after a thorough reviewing related literatures; it divided into two parts:

Part I: **Demographic characteristics** of the studied subjects including; age, gender, educational level, marital status, income and its source.

Part II: **Clinical data the studied subjects** such as history of fecal incontinence, Defecation habits, duration of defecation process, number of stool losses /days. History of chronic disease such as endocrinal disorders (Diabetes mellitus (DM), Hypertension, Cardiovascular disorder, Neurological disorder (stroke) gastrointestinal disorder (Diarrhea and constipation, fecal impaction and irritable bowel disease), genitourinary disorder (urinary incontinence, rectal prolapse), pelvic or rectal cancer. Past surgical history such as genital recto anal surgery (rectal prolapse, hemorrhoid & anal fissure) spinal surgery, vaginal surgery and hysterectomy

#### Tool II: Katz and Akpom Scale (1976):

This scale was developed by Katz and Akpom (1976)<sup>13</sup>; it is originally designed to assess the degree of dependency in performing activities of daily living (ADL). It was translated into Arabic language and validated by Melis and El Shazly (1999).<sup>14</sup> the scale includes six daily living activities namely, eating, grooming, dressing, toileting, bathing and mobility. The activities of daily living are measured and scored according to the individual's actual performance. A score of 6 means independent; a score from 7 to 12 is partially dependent, while a score from 13 to 18 is dependent.

#### Tool III: The Revised Faecal Incontinence Scale (RFIS):

The RFI scale is a short, valid and reliable five items scale. It can be used to assess FI. It was firstly developed by picking the best items of performing FI from Wexner Fecal Continence Grading Scale. It has recently been tested for validity by Sansoni et al (2013).<sup>15</sup> It consists of five questions on Likert scale from 1 (better) to 5 (worst); its total score is calculated by addition of the person's score for each single question and adding the scores for the five questions to obtain a total score that ranges from Zero to 20.

- A score of less than 4 indicates that the patient has no fecal incontinence or very mild symptoms.
- A score of 4 in screening surveys require further assessment by a continence practitioner.
- A score of 4 to 6 is considered as mild, score of 7-12 is moderate, and that of 13 or more is considered as severe.

#### Tool IV: The Fecal Incontinence Quality of Life (FIQL) Questionnaire:

A disease-specific tool, it was developed by Rockwood, et al (2000).<sup>16</sup> FIQL was used to assess the impact of fecal incontinence on four aspects of the patients' quality of life; lifestyles, coping behavior, embarrassment level, and depression or self-perception. Scores for each one of them is measured on a scale between 1 to 4, as 1 means very affected & 4 means not affected. The higher the score is, the poorer the quality of life.

### III. Procedure

1. An official letter was obtained from Faculty of Nursing, Mansoura University, Dean of Mansoura University Hospitals directors to obtain his approval of data collection, after explanation of the purpose of the study, and date and time of beginning data collection.
2. Tool I; (Structured Interview Sheet) was developed by the researchers based on recent and relevant literature review.
3. Tool II (Katz and Akpom Scale) will be used in Arabic languages.
4. Tool III (The Revised Fecal Incontinence Scale) and tool IV (The Fecal Incontinence Quality of Life (FI-QOL) questionnaire was translated into Arabic language.
5. Tool III and tool IV were forwarded translated into Arabic by two independent translators, any controversies in translation was modified.
6. The Arabic versions of Tool III and tool IV questionnaire was backward translated into English by two independent translators, any controversies in translation was modified.
7. The reliability of tool III and tool IV questionnaires were assured by Cronbach's coefficient alpha  $r=0.83$  and  $0.89$  respectively.
8. Validity of tools contents was obtained by a jury of 5 experts; in the fields of gerontological nursing and medical surgical nursing and their required modifications were done accordingly.
9. Elderly patients who answered that they have fecal incontinence was proceeded to questions relating to the frequency, severity of fecal Incontinence. The researcher surveyed them using revised fecal incontinences scale and QOL scale.
10. A pilot study was conducted on 10% (8) of the subjects to test for clarity and feasibility of the tools and needed modifications were done. The included subjects in the pilot study were later excluded from the whole study sample.
11. The researchers firstly visited the outpatient's clinic according each specialty based on its timetable schedule. Each elderly patient was interviewed individually.
12. The participated elderly patients took about 25-30 minutes to complete the data collection sheet after explanation the aim of the study to obtain their cooperation.
13. Data collection took a period of 6 months started from beginning of October 2019 to end of March 2020.

### Ethical considerations

The study protocol was approved by the Research Ethics Committee in Faculty of Nursing, Mansoura University. Written informed consent was taken from the studied subjects when accepted to contribute to our study after explaining the aims of the study. Their anonymity, privacy and confidentiality of the collected data were assured and maintained. They also had the right to withdraw from the study at any time.

### Statistical Analysis

After data collection, they were coded, to be suitable for computer feeding. The Statistical Package of Social Sciences "SPSS" software version 20.0 was utilized for data analysis and tabulation. Descriptive statistics were done using numbers, frequencies, percentages, arithmetic means and standard deviations. Analytic statistics were done with the Independent t-test, Anova test & Spearman's correlation coefficient. The 0.05 level of  $P$  value was used as a cut-off for statistical significance. Fisher's exact test was additionally used for the categorical data if the expected count was  $<5$  in four-cell tables. Confidence Intervals with 95% were calculated for the crude odds ratios. Variables that were significantly associated with FI in the bivariate analysis tests were entered in a stepwise logistical regression analysis with Forward-Wald method. 95% confidence intervals were calculated for the adjusted odds ratios. Statistical significance was considered at  $P$  value  $\leq 0.05$ .

### IV. Results

**Table (I):** Shows the overall prevalence of FI is 29.3%. The independent predictor of fecal incontinence is the presence of neurologic and endocrine diseases with AOR=1.8 and 0.5; respectively.

**Figure (2):** Shows the distribution of the FI studied subjects according to their FI severity; 68.5% of them have severe FI, 25.8% have moderate FI while the rest of FI subjects have mild FI.

**Figure (3) :** Shows the distribution of the FI studied subjects according to their level of dependency ; 55.1% of FI studied subjects were totally dependent in their activities of daily living while 44.9% were partially dependent.

**Table (II):** Shows the demographic characteristics and clinical data of the fecally incontinent studied subjects. 77.5% were middle-old with a mean of age  $68.29 \pm 4.87$ . As for sex; 62.9% of the studied subjects were females. 79.8% of the studied subjects had complete secondary level of education. 66.3% of the studied subjects depend on pension as their source of income while 80.9% of the subjects their income was inadequate. As for the presence of chronic diseases, 62.9% of FI elderly patients had neurological disorders while 20.2% of them

had endocrine disorders. As for the past surgical history, 66.7% of FI elderly patients had recto anal surgical history. Concerning frequency of stool loss, 60.7% of fecally incontinent patients had loss their control on defecation process more than twice /day. As for duration of defecation process, 95.5% of FI patients lasts for (1-5) minutes in defecation process.

**Table III:** illustrates the total mean scores quality of life of fecally incontinent elderly patients was 47.07±15.51, as for coping behavior domain mean score was 14.94±7.03, depression domain mean score of FI subjects was 13.07±4.10 while embarrassment domain was 4.57±1.80. A statistical significant differences was detected in the mean score of FI severity (15.05±4.60) within FI subjects in relation to their age, sex, level of dependency, presence of chronic disease and past surgical history

(p=0.000\*,p=0.000\*,p=0.000\*,p=0.044\*,p=0.015, respectively. while no statistical difference was detected in relation to educational level, duration of defecation, and frequency of stool loss. A statistical significant difference were detected in the total mean score of QOL within FI subjects in relation to their age, sex, duration of defecation, level of dependency, number of stool losses, presence of chronic disease and past surgical history (p=0.000\*,p=0.000,p=0.041,p=0.012\*,p=0.030\*, p=0.033,p=0.016 respectively). While no statistical difference was detected in relation their level of education.

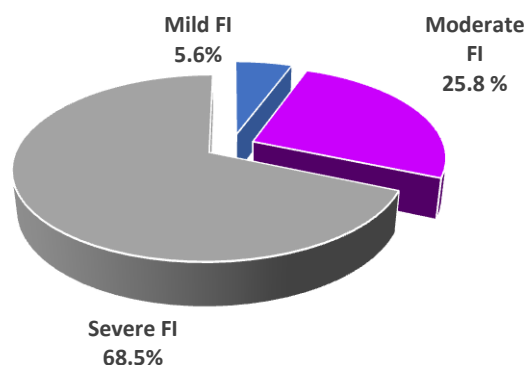
**Table IV:** showed the relationship between QOL total mean score of fecal incontinent subjects and their total mean score of FI severity: A significant correlation between the total mean score of the FI severity and mean score of QOL related four domains; life style, coping behavior, depression and embarrassment (p=0.000\*\*, p=0.000\*\*, p=0.001\*\*, p=0.000\*\* and p=0.000\*\* respectively. The higher mean score of FI severity (severe FI), the lower QOL mean score (more affected QOL).

**Table (I): Distribution of fecal incontinence and its associated factors among elderly patients.**

| Variables                | Total | FI N (%)  | COR (95% CI)        | AOR (95% CI)  |
|--------------------------|-------|-----------|---------------------|---------------|
| Overall                  | 304   | 89 (29.3) | -                   | ---           |
| <b>Age:</b>              |       |           |                     |               |
| <60 -                    | 173   | 20 (11.6) | 1(r)                | ---           |
| 70 & more                | 131   | 69 (52.7) | 8.5(4.8-15.2) ***   |               |
| <b>Sex:</b>              |       |           |                     |               |
| Male                     | 178   | 33 (18.5) | 1(r)                | ---           |
| Female                   | 126   | 56 (44.4) | 3.5(2.1-5.9) ***    |               |
| <b>Marital status:</b>   |       |           |                     |               |
| Married                  | 94    | 26 (27.7) | 1(r)                | ---           |
| Widow                    | 156   | 44 (28.2) | 1.0(0.6-1.8)        |               |
| Divorced                 | 54    | 19 (35.2) | 1.4(0.7-2.9)        |               |
| <b>Education:</b>        |       |           |                     |               |
| <Secondary               | 239   | 71(29.7)  | 1(r)                | ---           |
| >Secondary & above       | 65    | 18(27.7)  | 0.9(0.5-1.7)        |               |
| <b>Income:</b>           |       |           |                     |               |
| Enough                   | 68    | 17(25.0)  | 1(r)                | ---           |
| Not enough               | 236   | 72(30.5)  | 1.3(0.7-2.4)        |               |
| <b>Dependency:</b>       |       |           |                     |               |
| Partially dependent      | 209   | 40(19.1)  | 1(r)                | ---           |
| Totally dependent        | 95    | 49(51.6)  | 4.5(2.6-7.6) ***    |               |
| <b>Previous surgery:</b> |       |           |                     |               |
| No                       | 159   | 9(5.7)    | 1(r)                | ---           |
| Recto-anal surgery       | 87    | 58(66.7)  | 33.3(14.9-74.7) *** |               |
| Others                   | 58    | 22(37.9)  | 3.0(1.2-7.6)*       |               |
| <b>Chronic disease:</b>  |       |           |                     |               |
| Neurologic               | 88    | 56(63.6)  | 17.2 (8.6-34.1) *** | 1.8(1.1-27)*  |
| Endocrine                | 54    | 18(33.3)  | 4.9 (2.3-10.6) ***  | 0.5(0.3-0.9)* |
| Others                   | 162   | 15(9.3)   | 1(r)                | 1(r)          |

FI=fecal incontinence, COR: Crude Odds Ratio, AOR: Adjusted Odds Ratio, r: reference category, CI : confidence interval. \*,\*\*,\*\*\* significant difference at P≤ 0.05, ≤ 0.01 & ≤ 0.001; respectively

**Figure (2) : Distribution of fecal incontinence severity among studied subjects**



**Figure (3) : Distribution of dependency level of FI studied subjects**



**Table II: Demographic characteristics and clinical data of the fecal incontinent studied subjects (N=89)**

| Items  | FI studied Subjects |      |
|--|---------------------|------|
|  | N <sub>89</sub>     | %    |
| <b>Age (in year):</b>                                    |                     |      |
| >60- (young old)   | 20                  | 22.5 |
| 70 and more ( middle old)                                | 69                  | 77.5 |
| (Mean±SD) = 68.29±4.87) Minimum_ 60yrs – Maximum 76.0yrs |                     |      |
| <b>Sex:</b>  |                     |      |
| Males  | 33                  | 37.1 |
| Females  | 56                  | 62.9 |
| <b>Marital status :</b>                                  |                     |      |
| Married  | 26                  | 29.2 |
| Widowed  | 44                  | 49.4 |
| Divorced   | 19                  | 21.3 |
| <b>Level of education:</b>                               |                     |      |
| < secondary level  | 71                  | 79.8 |
| > secondary level  | 18                  | 20.2 |
| <b>Source of income:</b>                                 |                     |      |
| Pension  | 59                  | 66.3 |
| Relatives and Friends                                    | 2                   | 2.2  |
| Social affairs   | 9                   | 10.1 |
| Sons Help  | 19                  | 21.3 |
| <b>Monthly income:</b>                                   |                     |      |
| Adequate   | 17                  | 19.1 |
| Inadequate   | 72                  | 80.9 |
| <b>Chronic diseases</b>                                  |                     |      |
| Neurological disorder                                    | 56                  | 62.9 |
| Endocrinal disorders                                     | 18                  | 20.2 |
| Other disorders  | 15                  | 7.9  |
| <b>Surgical history #</b>                                |                     |      |
| No surgery   | 9                   | 5.9  |
| Recto-anal surgery                                       | 58                  | 66.7 |
| Others   | 22                  | 37.9 |
| <b>Number of stool loss</b>                              |                     |      |
| Twice/day  | 35                  | 39.3 |
| More than twice  | 54                  | 60.7 |
| <b>Duration of defecation process</b>                    |                     |      |
| 1-5 min  | 85                  | 95.5 |
| More than 5 min  | 4                   | 4.5  |

# More than one answer

**Table (III): Relation between demographic characteristics and clinical data of FI subjects, QOL related domains and FI severity.**

| Demographic characteristics and clinical data | FI Severity and Quality life subscales of FI subjects (Mean±SD) |                                |                               |                                |                                 |                                 |                                  |
|---|---|--------------------------------|-------------------------------|--------------------------------|---------------------------------|---------------------------------|----------------------------------|
|   | N   | Lifestyle                      | Coping behavior               | Depression                     | Embarrassment                   | QOL (total)                     | FI Severity                      |
| Overall                                       | 89  | 14.48±6.99                     | 14.94±7.03                    | 13.07±4.10                     | 4.57±1.80                       | 47.07±15.51                     | 15.05±4.60                       |
| Age in years:                                 |   |                                |                               |                                |                                 |                                 |                                  |
| >60-  | 20  | 12.75±5.8                      | 12.75±5.38                    | 12.43±4.06                     | 4.24±1.69                       | 42.18±12.93                     | 9.35±3.29                        |
| < 75-   | 69  | 20.45±7.4                      | 22.50±6.93                    | 15.30±3.49                     | 5.70±1.75                       | 63.95±11.37                     | 16.71±3.46                       |
| p- value:                                     |   | T <sub>2</sub> 4.85 (0.000) *  | T <sub>2</sub> 6.66 (0.000) * | T <sub>2</sub> 2.86 (0.005) *  | T <sub>2</sub> 3.35 (0.001) *   | T <sub>2</sub> 6.79 (0.000) *   | T <sub>2</sub> -8.45- (0.000) *  |
| Sex   |   |                                |                               |                                |                                 |                                 |                                  |
| Male  | 33  | 10.62±2.82                     | 12.19±5.32                    | 12.21±4.19                     | 4.05±1.69                       | 39.089±10.77                    | 10.84±3.30                       |
| Female  | 56  | 21.03±7.10                     | 19.60±7.20                    | 14.54±3.52                     | 5.45±1.64                       | 60.63±12.68                     | 17.53±3.25                       |
| p- value:                                     |   | T <sub>2</sub> 9.75 (0.000) *  | T <sub>2</sub> 5.54 (0.000) * | T <sub>2</sub> 2.67 (0.009) *  | T <sub>2</sub> 3.80 (0.000) *   | T <sub>2</sub> 8.51 (0.000) *   | T <sub>2</sub> -9.299- (0.000) * |
| Level of education:                           |   |                                |                               |                                |                                 |                                 |                                  |
| < Secondary                                   | 71  | 17.05±8.48                     | 14.94±7.30                    | 14.22±3.43                     | 5.05 ±1.95                      | 51.27±16.09                     | 15.40±4.77                       |
| > Secondary                                   | 18  | 13.83±6.46                     | 14.94±6.05                    | 12.78±4.22                     | 4.45±1.75                       | 46.01±15.29                     | 13.66±3.61                       |
| p- value                                      |   | T <sub>2</sub> -1.769- (0.080) | T <sub>2</sub> 0.000 (1.000)  | T <sub>2</sub> -1.330 (0.187)  | T <sub>2</sub> -1.276- (0.205)  | T <sub>2</sub> -1.291- (0.200)  | T <sub>2</sub> 1.443 (0.152)     |
| Duration of defecation                        |   |                                |                               |                                |                                 |                                 |                                  |
| 1-5 min                                       | 85  | 26.00±10.95                    | 14.25±2.06                    | 15.50±1.29                     | 6.75±0.50                       | 62.50±13.77                     | 15.12±4.66                       |
| 6-10  | 4   | 13.94±6.34                     | 14.97±7.19                    | 12.96±4.15                     | 4.47±1.77                       | 46.35±15.27                     | 13.50±2.64                       |
| p- value                                      |   | T <sub>2</sub> 3.592- (0.001)* | T <sub>2</sub> 0.201 (0.841)  | T <sub>2</sub> -1.211- (0.229) | T <sub>2</sub> -2.548- (0.013)* | T <sub>2</sub> -2.072- (0.041)* | T <sub>2</sub> 0.690 (0.492)     |
| Dependency level                              |   |                                |                               |                                |                                 |                                 |                                  |
| Partially dependent                           | 40  | 12.95±7.37                     | 13.18±6.54                    | 12.77±4.76                     | 4.44±1.90                       | 43.36±16.23                     | 11.97±3.91                       |
| Totally dependent                             | 49  | 16.35±6.078                    | 17.10±7.10                    | 13.45±3.12                     | 4.72±1.67                       | 51.62±13.40                     | 17.57±3.46                       |
| p- value                                      |   | T <sub>2</sub> 2.33 (0.022) *  | T <sub>2</sub> 2.70 (0.008) * | T <sub>2</sub> 0.77 (0.443)    | T <sub>2</sub> 0.71 (0.475)     | T <sub>2</sub> 2.57 (0.012) *   | T <sub>2</sub> -7.15- (0.000) *  |
| Frequency of stool loss                       |   |                                |                               |                                |                                 |                                 |                                  |
| <Twice/day                                    | 35  | 15.54±7.59                     | 15.05±7.07                    | 12.65±3.40                     | 4.34±1.57                       | 47.60±15.59                     | 14.42±4.77                       |
| >Three/day                                    | 54  | 13.79±6.55                     | 14.87±7.07                    | 13.35±4.50                     | 4.72±1.93                       | 46.74±15.59                     | 15.46±4.48                       |
| P- value                                      |   | T <sub>2</sub> 1.15 (0.252)    | T <sub>2</sub> 0.122 (0.904)  | T <sub>2</sub> -0.779- (0.438) | T <sub>2</sub> -0.970- (0.335)  | T <sub>2</sub> 0.254 (0.800)    | T <sub>2</sub> -1.037- (0.303)   |
| History of chronic disease                    |   |                                |                               |                                |                                 |                                 |                                  |
| Neurological disorder                         | 56  | 18.46±8.34                     | 18.40±8.86                    | 13.08±4.35                     | 4.57±1.93                       | 53.80±16.92                     | 16.50±4.76                       |
| Endocrinal disorders                          | 18  | 13.75±6.43                     | 14.26±6.31                    | 13.61±3.89                     | 4.61±1.78                       | 45.83±15.98                     | 15.25±4.15                       |
| Others  | 15  | 13.44±6.70                     | 14.16±7.08                    | 12.40±3.45                     | 4.53±1.35                       | 45.67±14.77                     | 12.60±5.32                       |
| P- value                                      |   | F <sub>2</sub> 3.08 (0.051)*   | F <sub>2</sub> 2.237 (0.113)  | F <sub>2</sub> 0.352 (0.705)   | F <sub>2</sub> 0.008 (0.0993)   | F <sub>2</sub> 1.722 (0.185)    | F <sub>2</sub> 3.229 (0.044)*    |
| Past surgical history                         |   |                                |                               |                                |                                 |                                 |                                  |
| No surgery                                    | 9   | 21.00±7.43                     | 20.66±5.97                    | 14.00±4.06                     | 4.77±1.48                       | 60.44±10.05                     | 16.54±5.04                       |
| Recto anal surgery                            | 58  | 14.13±6.71                     | 14.48±6.45                    | 13.17±4.30                     | 4.62±1.92                       | 46.41±15.22                     | 15.06±4.19                       |
| others  | 22  | 12.72±6.30                     | 13.81±8.05                    | 12.45±3.63                     | 4.36±1.61                       | 43.36±15.74                     | 11.33±4.38                       |
| P- value                                      |   | F <sub>2</sub> 5.110 (0.008)*  | F <sub>2</sub> 3.57 (0.032)*  | F <sub>2</sub> 0.491 (0.614)   | F <sub>2</sub> 0.223 (0.801)    | F <sub>2</sub> 4.330 (0.016)    | F <sub>2</sub> 4.418 (0.015)*    |

\* Significant P < 0.05

F<sub>2</sub> One-way ANOVAs test

T<sub>2</sub> = student t -test

**Table IV: Correlation between the total mean score of QOL related domains of FI subjects and their total mean score of FI severity**

| QOL related domains of FI subjects (Mean±SD) | Fecal incontinence severity (Mean±SD) |         |
|--|---------------------------------------|---------|
|  | r                                     | p       |
| - Lifestyle                                  | -0.665-                               | 0.000** |
| - Coping behavior                            | -0.598-                               | 0.000** |
| - Depression                                 | -0.340-                               | 0.001** |
| - Embarrassment                              | -0.448-                               | 0.000** |
| - Total QOL domains                          | -0.713-                               | 0.000** |

\*\*Significant Correlation at 0.01 levels

## V. Discussion

Fecal incontinence is defined as a complaint of the involuntary loss of liquid (loose) or solid (hard) stool, it is a physical and psychosocial devastating condition which has negative impacts on person's QOL. This will lead to embarrassment, social isolation, loss of employment, as well as intimate social relationships and lack of self-esteem Meyer & Richter (2015).<sup>11</sup> The present study showed that nearly one quarter of the studied subjects complain of by FI which reflect that FI is hidden unreported problem among geriatric patients. This result may be explained by most elderly people may have social stigma of reporting FI problem and ought any problem to the effect of aging. Similar finding was reported high prevalence of FI among residents of Bali Indonesia (2015)<sup>17</sup> while Cabrera, Rodri'guez (2018)<sup>5</sup> found that FI affects among 3% to 21% of patients older than 65 years old in general population of the study, also, more than 50% of the institutionalized ones and more than 80% of the hospitalized patients. Similar finding was reported by Edwards & Jones (2001)<sup>18</sup>, Alsheik et al, (2012)<sup>19</sup> Shahin & Lohrmann (2015)<sup>20</sup>, Stokes et al, (2016)<sup>21</sup> and Condon et al, (2019)<sup>8</sup>.

As for fecal incontinence severity among the studied subjects, severe FI was the most prevailing among the studied subjects followed by moderate and mild FI. This result may be justified by elderly people may not report their FI problem except they may reach to advanced stage of FI. This result is in contrast with other studies done in Malaysia by Roslani et al, (2014)<sup>10</sup> & a study done in Korea by Kang et al, (2012)<sup>22</sup> who reported that mild FI was the most prevailing in their subjects followed by moderate FI then severe FI. This difference may be cultural background difference as Egyptian elderly don't care of their health specially in end stage.

As for age, the present study showed that fecal incontinence was prevailing among middle-old elderly than old-old elderly. This result may be explained by most of FI patients were middle old, in addition elderly people in this age group may still have interest and able to seek medical care compared to old-old moreover most of sample are categorized in this age group. This result is in contrast with a study done in Trondheim municipality, Norway (2013)<sup>23</sup> which reported that prevalence of fecal incontinence was common among old-old elderly than middle-old and young-old elderly. Moreover Costilla, et al (2013)<sup>24</sup> assert on FI incidence increases significantly with age. This difference may be due to longer life expectancy of elderly in developed countries than developing countries like Egypt.

As for sex, FI was more common among elderly females than males. This finding may be related to elderly females with FI may bother from this problem rapidly than males so they may tend to report their problem in order to ask help. Moreover, females have pervious risk factors such as multi-para, heavy housekeeping activities which contribute to weakening the pelvic floor muscles. This result in agreement with other studies done in U.S by Ditah et al, (2010)<sup>25</sup> and a study done in Malaysia by Roslan et al, (2014)<sup>10</sup> & Sansoni et al, (2013)<sup>15</sup> While Kang et al, (2012)<sup>22</sup> contrary to the results of the current study that FI was most common among males than females.

Regarding education level, the present study showed that FI was most frequent occur among elderly with low educational level. This may be related to low education may result in poor knowledge and awareness about FI risk factors, and measures of its management. This result is in the same line with another study done in Brazil by Jerez-Roig et al, (2015)<sup>26</sup> While a pervious study in 2001 in the United Arab Emirates found that fecal incontinence affects 11.3% of females.<sup>27</sup> Also, another one done in Qatar stated that 10.4% was the prevalence rate in postmenopausal women.<sup>28</sup>

The study findings also revealed that FI may be associated with some chronic diseases especially neurological disease. This result is consistent with other studies done by Jerez-Roig, et al (2015)<sup>26</sup> in Northeast Brazil & Santos et al (2014)<sup>29</sup> in Southern Brazil who reported that stroke as one of neurological diseases was most common among elderly with FI. This may be explained by neurological diseases, such as stroke may be directly associated with cognitive impairment that sequentially is considered to be a significant factor for FI. In contradict with our finding another study done by Shah et al (2012) in USA revealed that elderly's prevalence of FI isn't illustrated by the elevated incidence of comorbidities.<sup>30</sup>

Previous surgical history may be considered a risk factor for developing FI. The present study showed that FI may be associated with some surgical history as recto-anal surgery and vaginal surgery. This result may be explained by these types of surgery may affect excretory organs and related nerves which contribute to loss of defecation over control. This result in contrast with another study done by Roslani et al, (2014)<sup>10</sup> who reported surgical history may not be a significant risk factor for developing FI.

Concerning level of dependency, the current study revealed that more than half of FI patients were totally dependent on others. This result may attribute to elderly people may have comorbidities and most of them were widowed which make them unable to be self-dependent to provide care for themselves. This result comes in agreement with another study done by Jerez-Roig et al (2015)<sup>26</sup> in Brazil who reported that most of their subjects were highly dependent on others. In addition to Al Ameel et al., (2010) assert on fecal inconsistency is considered as a marker of poorer health status.<sup>31</sup> while Burge et al (2013) reported that FI is a contributing factor to the deterioration of functionality of the ADLs.<sup>32</sup>



Regarding duration of defecation process, the present study showed that the majority of fecally incontinent patients last (1-5) minutes during defecation process. This result is in contrast with Roslani et al (2014)<sup>10</sup> who reported that FI was associated with increased duration of defecation. As for number of stool loss, the present study showed that more than one third of FI patients had twice of stool loss/ day. This result is consistent with a study done in Malaysia by Roslan et al (2014) who reported there was association between FI and defecation frequency.<sup>10</sup>

The current study revealed statistic significant differences between FI severity mean score within FI subjects in relation to their age, sex, level of dependency, presence of chronic disease, and past surgical history, while no statistical difference was detected in relation to educational level, duration of defecation, and number of stool losses. This is in contrast with other studies done by Alsheik et al, (2012)<sup>19</sup> & Mundet et al, (2016)<sup>33</sup> who reported that there were no significant differences between severity of FI and sex.

Moreover; statistic significant differences were detected in mean score of QOL within FI subjects in relation to their age, sex, duration of defecation, level of dependency and past surgical history, while no statistical difference was detected in relation their number of stool losses, presence of chronic disease and level of education. This result may be attributed to women more embarrassed by FI than men, there by negatively affecting their QOL. These results in line with other studies done by Alsheik et al, (2012)<sup>19</sup> & Mundet et al, (2016) who reported that women with FI were found to have a significantly low QOL.<sup>33</sup>

Finally, a strong significant correlation between; the total mean scores of the FI severity and mean scores of QOL related four domains; lifestyle, coping behavior, depression and embarrassment, While the higher mean score of FI severity (severe FI), the lower QOL mean score, the more affected QOL. This finding is in line with another study done by Sánchez-Ávila et al, (2018) who reported that there was a positive correlation was found between the severity of incontinence and lifestyle dimension, shame, behavior and the average of the four dimensions but not with the depression dimension of the quality of life in fecal incontinence.<sup>34</sup> Also, the study by Alsheik et al, (2012)<sup>19</sup> showed that QOL significantly correlated with FI severity in women but not in men. In the same line a study done by Bharucha et al, (2015)<sup>3</sup> reported that there are significant correlations between symptoms severity of FI and QOL's domains. It can be said that, FI is a missing, common problem among elderly populations and need to be considered. FI affect negatively on the QOL of elderly population. The research study can be considered as a starting point and step for initiation in this issue.

## VI. Conclusion

Fecal incontinence affected nearly one quarter of the studied subjects. Fecal incontinence was more prevalent among females than in males. The presence of neurologic and endocrine diseases is the independent predictors of fecal incontinence among elderly patients. Moreover, there were strong significant correlations between fecal incontinence severity and quality of life's domains; coping behavior, lifestyle, depression and also embarrassment, the higher mean score of fecal incontinence severity was, the lower QOL life mean score, the more affected QOL of FI subjects.

## VII. Recommendations

- Development of pelvic floor muscle rehabilitation program for elderly patients to enhance their pelvic floor muscle control.
- Planning of lifestyle and dietary habits program to fecally incontinent elderly patients enhance their life-style patterns.
- Application of new therapies of fecal incontinence management such as biofeedback, and toileting assistance programs.

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