

## Prevalence of Fecal Incontinence among a Healthy Population in a Tertiary Referral Center in Ireland

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**Received:** 16/05/2019

**Revised:** 03/08/2019

**Accepted:** 13/08/2019

### Abstract

**Background:** Fecal incontinence (FI) is a debilitating condition associated with social isolation and poor quality of life. The prevalence of FI within the Irish setting has yet to be fully elucidated. The aim of the current study was to provide insights into the prevalence of FI among the population of the west of Ireland.

**Methods:** An anonymized questionnaire-based survey was conducted between May and August 2018 in a tertiary referral center. Staff members and patients above the age of 18 years were invited to take part in the study. The Rome IV criteria for FI was utilized. Data collected included patient demographics, co-morbidities, FI risk factors, as well as surgical and obstetric history. Severity of fecal incontinence was assessed using the Wexner Continence Scale (WCS).

**Results:** A total of 200 participants (F/M: 124/76; median age: 47 years (18-86 years)) were enrolled into the study. The overall prevalence of FI was 31.5% (63/200). 81 participants (40.5%) had experienced some form of bowel dysfunction in the past. Of the 81, only 45 (55.5%) had discussed their FI symptoms with a healthcare professional. The FI group featured 14 individuals (7%) with severe incontinence (Wexner score  $\geq 9$ ), while 18 (9%) reported moderate incontinence (Wexner score 5-8) and 31 (16%) reported mild incontinence (Wexner score 1-4). The FI cohort had a significantly greater incidence of inflammatory bowel disease, irritable bowel syndrome and previous bowel surgery ( $P < 0.05$ ).

**Conclusion:** FI is highly prevalent among staff and patients at University Hospital Galway. Improvements in social awareness and knowledge regarding appropriate referral and reporting pathways is essential in order to counter the social stigma and improve the quality of life for FI patients.

**Keywords:** Fecal incontinence, Prevalence, Wexner continence scale, Rome IV criteria

Please cite this paper as:

Sirr C, Rooney SM, Samy A, Sehgal R, Hogan AM. Prevalence of Fecal Incontinence among a Healthy Population in a Tertiary Referral Center in Ireland. *Ann Colorectal Res.* 2019;7(3):2-7. doi: .

## Introduction

Fecal incontinence (FI) is the recurrent involuntary loss of feces, with varying severity between episodes (1). It is regarded as a taboo subject, and affected patients are often stigmatized to the degree of becoming socially isolated. This has profound negative psychological effects, and reduces the individual's quality of life (2, 3).

Several risk factors for FI exist, with previous obstetric trauma leading to pudendal nerve or sphincter complex dysfunction being the most common in females (4). In men, the most commonly reported risk factor is anal surgery, including hemorrhoidectomy (5). Other factors for the development of FI include chronic diarrhea, spinal cord injury, post-pelvic radiation complications, and cognitive impairment. Moreover, conditions such as diabetes, inflammatory bowel disease, multiple sclerosis, and Parkinson's disease have also been implicated (6).

FI is a condition that is not accurately reported or diagnosed due to patients' reluctance to voluntarily discuss their symptoms or seek help from a healthcare professional. Women are more forthcoming with their symptoms compared with men. The prevalence of this condition increases with age, and estimates of FI vary widely across patient populations and by the criteria used to define FI, especially in regard to the character and frequency (7, 8). The prevalence of monthly bowel leakage among community-dwelling adults is approximately 8.3% overall, with a higher prevalence among women (9%) relative to men (7.7%). FI affects less than 3% of young adults aged between 20 to 29 years; however, more than 15% of adults above the age of 70 years have an element of FI (1, 9).

There are numerous scoring systems used to assess the severity of FI (10-12). In 1983, Browning and Parks devised a FI scoring system that evaluates whether patients are incontinent for solid stool, liquid stool, or flatus. In this scale, loss of liquid stool is considered low in severity compared with incontinence for both solid and liquid stool (13). In 1992, Pescatori evaluated 335 FI patients and scored FI severity based on both the degree and frequency of symptoms (14). Scores ranged from 0 (continent) to 6 (severe incontinence), but failed to account for the amount of stool lost. Other incontinence outcome measures include the St. Mark's (Vaizey) Fecal Incontinence score (10), the American Medical Systems score (15), and the Fecal Incontinence Quality of Life (Rockwood) Scale (16). In 1993, Wexner developed the first FI scoring system that accounts for the number of pads used and lifestyle alterations in addition to the consistency and frequency of FI (17). This is a widely used scoring system as it is simple for both healthcare professionals and patients to use.

Several population-based surveys have been conducted in order to estimate the prevalence of

FI (18-23). The prevalence of FI amongst the Irish population is, to date, unknown. To this end, the aim of the current study was to provide insight into this issue by determining the prevalence of FI within an Irish context.

## Methods

An anonymous survey was conducted between May and August 2018 at University Hospital Galway. All adults above the age of 18 years were eligible for inclusion into the study. The Rome IV definition for FI was used, i.e. "the uncontrolled passage of solid or liquid stool with no distinction made on the basis of presumed etiology".

Staff members as well as patients that attended the general surgical outpatient clinics and emergency surgery ward were approached to partake in the study. Subjects provided verbal consent to participate in the study and were asked to complete an anonymous self-administered questionnaire. The questionnaire included questions on demographics, FI symptoms, surgical history and chronic illness. Subjects who reported FI were asked further questions regarding the severity of their symptoms and whether they had ever consulted a health care professional regarding their condition.

Severity of FI was assessed using the Wexner Continence Scale (WCS). This grading system is a simple to use, patient-friendly tool that has been validated and widely used for the assessment of FI severity. The WCS accounts for the number of pads used and lifestyle alterations made in addition to the consistency and frequency of incontinence. Each WCS domain contains five levels of severity ranging from 0 (never) to 4 (always) (Table 1).

Hospital staff and patient questionnaires were analyzed together in order to create a representative cross-section of the population. Data was collected on a Microsoft Office Excel 2016 spreadsheet (Microsoft Corporation, USA) and analyzed using the Fisher's exact test and Mann-Whitney U test where appropriate. All analyses were performed with IBM SPSS Statistics version 23.

## Results

A total of 200 subjects were surveyed. Median age was 47 years (range: 18 to 86 years) with a female preponderance (N=124) compared with males (N=76). People who reported no symptoms for FI were significantly younger than the participants who reported some degree of FI (42 years vs. 53 years,  $P < 0.0001$ ).

Sixty-three subjects surveyed had an element of FI (31.5%). The majority were female (75.8%), with a median age of 53 years. As expected, FI patients had significantly higher incidence of inflammatory bowel disease, irritable bowel syndrome, and bowel surgery (Table 2). The WCS results are summarized in Figure 1.

**Table 1:** Wexner continence scale frequency

Type of incontinence	Wexner Continence Scale				
	Frequency				
	Never	Rarely	Sometimes	Usually	Always
Solid	0	1	2	3	4
Liquid	0	1	2	3	4
Gas	0	1	2	3	4
Wears pad	0	1	2	3	4
Lifestyle alteration	0	1	2	3	4

Never: 0; Rarely: 1/month; Usually: 1/week; Always: >1/day

Score: 0=Perfect; 20=Complete incontinence

**Table 2:** Demographics and medical history provided by participants

	Total Group	Fecal Incontinence	No Abnormality	P
Overall	200	63	137	
Sex				<0.05
Men	76	16	60	
Women	124	47	77	
Median Age	47	53	42	<0.01
Co-Morbidities				
Metabolic disorders	16	11	5	
GI Disease	21	15	6	
Cardiovascular Disease	14	6	7	
Respiratory Disease	15	6	9	
Urology pathology	8	5	3	
Parity	124	51	73	<0.05
Null parity	41	11	30	
Parous Women	83	40	43	
Mode of Delivery				NS
Vaginal Births	75	34	41	
Caesarean section	8	5	4	
Risk Factors				
Diverticular Disease	32	19	13	NS
Inflammatory Bowel Disease	11	9	3	<0.05
Irritable Bowel Syndrome	38	29	9	<0.01
Colorectal Malignancy	12	7	5	NS
Bowel Surgery	18	15	3	<0.01
Gynecological Surgery	21	13	8	NS
Bowel Dys. discussed?	44	44	-	<0.01
Male Yes		9	-	
Female Yes		35	-	

NS: Not significance; P>0.05

**Table 3:** Odds ratio, 95% confidence intervals and P values for the association of birth variables with fecal incontinence

	Odds ratio	95% confidence interval	P <sup>a</sup>
Multiparty	1.69	0.58-4.97	0.335
Fetal weight >4000g	1.38	0.34-5.6	0.629
Instrument assisted delivery (forceps/ vacuum)	3.27	1.12-9.56	0.0026
Caesarean Section	0.53	0.17-1.65	0.270

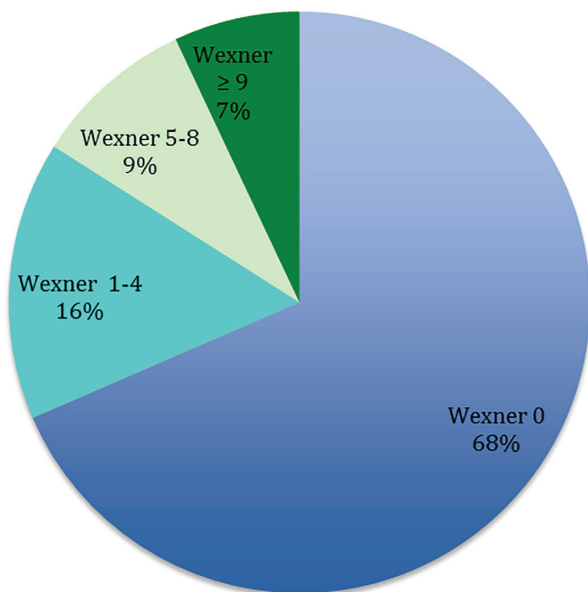
<sup>a</sup> By  $\chi^2$  test

For the entire cohort, 14 subjects (7%) reported severe incontinence (Wexner score  $\geq 9$ ), 18 (9%) reported moderate incontinence (Wexner score 5-8) and 31 (16%) reported mild incontinence (Wexner score 1-4).

Out of the 200 participants, 81 (40.5%) had experienced some form of bowel dysfunction in the past. Among these 81, only 45 (55.5%) reported that

they had discussed their symptoms with a healthcare professional.

There was a total of 83 parous women who reported a total of 132 live births, among which there were 8 cesarean sections and 16 instrument deliveries. Out of these 83 women, 48 (37.9%) reported FI in general. Forty (48%) women reported some



**Figure 1:** Wexner Continence Score for study participants.

element of FI. There was no significant association found between obstetric variables such as parity, fetal weight or cesarean section and FI. The most significant obstetric variable associated with FI was operative vaginal delivery (vacuum or forceps) (OR, 3.27; 95% CI, 1.12–9.56;  $P=0.026$ , for FI) (Table 3).

## Discussion

Fecal incontinence is a common condition that affects both genders irrespective of socio-economic status (21, 24, 25). This debilitating condition is attached with significant social stigma and leads to feelings of embarrassment and helplessness, which translate into social confinement and poor quality of life (26). As the prevalence of FI is unknown in Ireland, the goal of this study was to perform a survey within an Irish healthcare environment in order to gauge the magnitude of this sensitive issue.

Within our cohort of 200 healthy community-dwelling Irish adults, 32% had an element of FI. This is higher in comparison with other population-based studies for FI. Sharma et al. recently reported prevalence rates for FI ranging between 1.4 to 19.5% (27) in a systematic review. In this review, the included studies were heterogeneous in terms of the age of recruitment, response rate, study methodology and definition of FI (27). Our study utilized stringent criteria by employing the latest Rome IV diagnostic criteria for diagnosing FI (28). The diagnostic criteria have undergone substantial changes since the previously published Rome III criteria. Rome III distinguishes functional fecal incontinence from structural or neurogenic FI, whereas Rome IV simply defines FI as the uncontrolled passage of solid or liquid stool without making any distinction on the presumed etiology (29, 30).

In the results of the current study, 7% had severe incontinence (Wexner score  $\geq 9$ ), 9% reported

moderate incontinence and 16% reported mild incontinence (Wexner score 1-4). Even though this study was limited by the number of subjects analyzed, it does provide some insight into the prevalence and severity of FI in an Irish context. Moreover, we analyzed patients that came through the general clinics and emergency ward together with staff members in order to create a representative cross section of the population.

The prevalence of FI was higher amongst females and increased with age. Although most reported series do show a preponderance for females being affected by FI due to pelvic floor dysfunction after childbirth and obstetrical trauma (31-34), epidemiological studies demonstrate that both sexes are affected equally (18, 35). Preventing pelvic floor disorders, such as FI and pelvic organ prolapse, has become a major target of pelvic floor research. The association between vaginal operative delivery and damage to the pelvic floor has been described previously (36), though long-term data are still lacking. The results of the current study are consistent with other data demonstrating that vacuum and forceps deliveries are risk factors for major trauma to the pelvic floor and are associated with FI (37).

Our study found that 44.5% of subjects chose not to discuss their symptoms with a healthcare professional. This is similar to other studies as only one third of symptomatic patients in the USA are willing to speak with their physician (31, 38). In the United Arab Emirates, 60% of multiparous women with FI avoid talking about their symptoms due to embarrassment, shame, the assumption that FI is part-and-parcel of growing old, or the assumption that their symptoms will resolve spontaneously (38, 39). Symptom severity does seem to be directly proportional to the impact on quality of life and physician-consulting behavior (3). In their cohort, Bharucha et al. demonstrated that 5% with mild, 10% with moderate, and 48% with severe FI had consulted a physician (40). Of those who sought care, the majority were women who had discussed their FI symptoms with a family physician, internist, or gastroenterologist. Affected patients were less likely to discuss their symptoms with a colorectal surgeon or gynecologist/urogynecologist (41). Similarly, it has been shown that healthcare professionals such as general practitioners are reluctant to inquire about FI owing to the limited level of awareness regarding the investigation modalities and treatment options available (41-44). Furthermore, Dunivan et al. demonstrated a low level of screening for FI within the primary care setting (45). Therefore, an increased level of social awareness, screening and knowledge pertaining to existing diagnostic tests and surgical treatment options for FI is warranted. Moreover, a streamlined referral care pathway is essential, and FI patients should be referred to specialized centers that offer a multidisciplinary approach to the management of FI. Improved social awareness combined with

improved medical educational programs and open communication between patients and allied healthcare professionals is warranted in order to improve service delivery for this silent epidemic.

## Conclusion

Fecal incontinence is common condition that may go unaddressed if patients do not feel comfortable discussing their symptoms with

healthcare providers. This condition remains both underestimated and under-diagnosed. Improved awareness and collaboration between allied health care professionals should be encouraged to provide patients with better, more-adapted and more-efficient care. This study serves as a platform for further studies into the etiology, management and prevention of FI.

**Conflict of Interests:** None declared.

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