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<http://onlinelibrary.wiley.com/journal/10.1111/%28ISSN%291741-6612>

doi: 10.1111/ajag.12141

Please cite this article as:

Suyasa, I. G. P. D., Xiao, L. D., Lynn, P. A., Skuza, P. P. and Paterson, J. (2014), Prevalence of faecal incontinence in community-dwelling older people in Bali, Indonesia. *Australasian Journal on Ageing*.

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Prevalence of faecal incontinence in community-dwelling older people in Bali, Indonesia

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Objectives: *To explore prevalence rate of faecal incontinence in community-dwelling older people, associated factors, impact on quality of life, and practices in managing faecal incontinence.*

Method: *Using a cross-sectional design, 600 older people aged 60+ were randomly selected from a population of 2,916 in four villages in Bali, Indonesia using a simple random sampling technique. Three hundred and three participants were interviewed (response rate 51%).*

Results: *The prevalence of faecal incontinence was 22.4% (95% CI 18.0-26.8). Self-reported constipation (OR 3.68, 95% CI 1.87-7.24) and loose stools (OR 2.66, 95% CI 1.47-4.78) were significantly associated with faecal incontinence. There was a strong positive correlation between total bowel control score and total quality of life score ($p < 0.001$, $r_s = 0.61$) indicating significant alterations in quality of life. The current management practices varied from changing diet, visiting healthcare professionals, using modern and traditional medicines.*

Conclusion: *Faecal incontinence is common among community-dwelling older people in Bali.*

Key words: *epidemiology, faecal incontinence, Indonesia, quality of life, risk factors.*

Introduction

The number of older population in Indonesia is increasing rapidly. In 2010, there were around 18 million older people aged 60 years and above [1]. The prevalence rate of faecal incontinence is relatively higher among older population compared with other age groups [2]. Faecal incontinence is reported as one leading causes for institutionalised care in western countries [3]. However, nursing homes and other types of aged care facilities are underdeveloped and not commonly used in Indonesia. Older people requiring care are provided for at home in the community [4].

Faecal incontinence – defined as loss of control of loose or solid stool – is widely reported in Western societies. The prevalence rates range from 6-12% in community dwelling older people [5,6] and between 10-60% in residents in aged care facilities [7,8]. Faecal incontinence in itself is not a life threatening condition. However, it significantly affects the quality of life of older people. Faecal incontinence can cause older people to limit their daily living activities because of fear of detection and shame due to bad smells to the extent they may become socially isolated [9]. Previously reported factors contributing to faecal incontinence are gender (female), anxiety, depression, physical disability and chronic diarrhoea [6,10]. Self-management strategies have been described for older people in the western world [11], but little is known about self-management strategies in other cultures.

The prevalence rate, the associated factors and the effect of faecal incontinence on the quality of life of older people in Indonesia are currently undocumented. This study aimed to explore: 1) prevalence rate of faecal incontinence in community-dwelling older people, 2) associated factors of faecal incontinence, 3) impact of faecal incontinence on quality of life, and 4) current practices in managing faecal incontinence.

Method

This study was approved by the Social and Behavioural Research Ethics Committee Flinders University and the National Unity, Politics and Public Protection of Bali Province and Denpasar City.

Sample

Six hundred potential participants aged 60 years and above from the area of Community Health Centre of Northern Denpasar III in Bali, Indonesia were selected using a simple random sampling technique from the total population of 2,916 older people in the research setting. This sample size was calculated using a one-sample proportion formula for prevalence studies [12]. During data collection between August 2010 and February 2011, 51% of approached participants agreed to take part in the study, resulting in final sample size of 303 older people that were interviewed by the trained nurses.

Questionnaire

The questionnaire was developed based on modification and adaptation from published studies investigating constipation and faecal incontinence. The permission for modification of the questionnaire was granted [14-16]. The modifications of Parts A (demographics), B (medical histories), C (constipation) and the rationale for modifications are summarized in Table 1. The modification of Part C was made in order to meet Rome III criteria for functional constipation [16]. Part D (faecal incontinence) was the International Consultation on Incontinence Questionnaire-Bowels (ICIQ-B) module in its entirety [15]. ICIQ-B was used in this study to explore the prevalence rate of faecal incontinence based on the definition used, to measure bowel control and quality of life.

Delivery

Six community nurses were trained as data collectors to assist participants to complete the questionnaires using structured interview. This method was chosen due to the low level of literacy in Indonesia [1]. Older people who were randomly selected from the total population were listed as potential participants. Data collectors were trained to contact them by visiting their houses, reading all written information to them, asking them to contact the data collector via a given phone number if they were willing to voluntarily participate in the study. Colloquiums and local dialects around faecal incontinence were also discussed and generated during the training of data collectors to assist the data collection.

Definition of faecal incontinence

The definition of faecal incontinence was based on affirmative answers of either: never, rarely, some of the time, or most of the time, in response to the question “Are you able to control watery or loose stool leaking from your back passage?” and/or the question “Are you able to control accidental loss of formed or solid stool from your back passage?”. The time period was “during the past three months”, which is consistent with ICIQ recommendation [15].

Bowel control

Bowel control was measured using ICIQ-B [15] which contained seven items: 1) Staining underwear/need to use pads, 2) Frequency of liquid stool leakage control, 3) Frequency of solid stool leakage control, 4) Frequency of flatus leakage control, 5) Frequency of mucus leakage control, 6) Unexplained incontinence, and 7) Unpredictability. Total bowel control scores were calculated by summation of individual scores from each item, with lower scores indicating better bowel control.

Quality of life

Quality of life was measured using quality of life questions incorporated in the ICIQ-B module [15]. It measured quality of life from five criteria: 1) Embarrassment, 2) Toilet location awareness, 3) Planning according to bowels, 4) Staying home more, and 5) Overall bowel interference. Total quality of life score were calculated by summation of individual scores from each item, with lower scores indicating better quality of life.

Current management practices

Current management practices were measured using two questions: 1) A close ended question on “Do you use medications (tablets or liquids) to stop you opening your bowels?”, and 2) An open ended question on what actions older people took to address the difficulties in controlling their bowels.

Reliability and validity

Various reliability and validity tests following the development of the questionnaire were conducted. Inter-rater agreement was not statistically determined in this study. However, trial interviews were arranged among six older people during the training of data collectors. These interviews were paired in six different configurations, so each older person was interviewed twice by different interviewers. This allowed data collectors to improve their interviewing skills to reduce any potential disparities between the interviewers.

The test-retest reliability was measured within a two-week interval with 60 participants involved. Agreements of demographic data and medical histories were reached at 100% and between 93-100% respectively. Weighted Kappa statistics ranged from 0.80-1.00 for individual items on constipation, between 0.56-1.00 for questions around bowel control and

0.65-0.83 for quality of life. Following generally acceptable rules of Kappa interpretation [17] even the smallest obtained values indicate at least moderate agreement.

The reliability and validity of the combined scales for bowel control and quality of life were previously tested extensively in the United Kingdom and found to be satisfactory [15]. Given that ICIQ-B has been created relatively recently and has not been tested in Indonesia, we replicated some of the reliability and validity tests conducted in the original paper excluding bowel patterns as irrelevant to this paper. Content validity was assessed by additional interviews with participants and clinical experts that indicated that questionnaire items were well interpreted and covered all important domains providing arguments for face validity. Factorial validity was assessed using Exploratory Factor Analysis (EFA) following procedures used by scales creators [15]. The internal consistency of combined scales was assessed by calculating Cronbach's Alpha. Magnitudes of 0.88 for bowel control scales (7 items) and 0.72 for total measure of quality of life (5 items) were above general acceptable threshold of 0.7 [18].

Statistical analyses

All statistical calculations in this study were performed using PASW statistics version 18. Bivariate statistical analyses were conducted using *t*-test for approximately normally distributed data, Mann-Whitney U test for non-normally distributed data and chi square tests for categorical variables with Fisher's exact test when appropriate. The association between bowel control score and quality of life score was analyzed using the Spearman's rho correlation. All statistical tests were two tailed, with statistical significance defined as $p < 0.05$. Effect sizes were calculated and reported as eta squared (η^2) for *t*-test, *r* for Mann-Whitney U test and phi coefficient (ϕ) for chi square or Fischer's exact test. The magnitude of them was quantified using Cohen's guidelines [19]. Finally, multivariate logistic

regression was conducted with predictors entered into the model determined by theoretical considerations as well as initial bivariate results. Due to the need for manageable length of the interviews, potentially important predictors of faecal incontinence mentioned in literature such as physical disability and depression [6,10] could not be measured. This is recognised as a limitation as their inclusion could further improve the multivariate model.

Results

Missing data

In the whole collected data, missing values appeared in seven out of 64 questions in total. These 7 questions all related to medical/labour histories and may be related to participants' difficulties in recalling past events. The missing data concerning labour histories could be further compounded by the likelihood that the majority of female participants would have experienced home deliveries attended by traditional birth attendants result in poorly documented labour history [20].

Characteristics of sample

The age distribution of older people was positively skewed with median age of 67, and ranged from 60 to 97 years. The proportion of female participants was higher than male (62 vs. 38%). Forty six percent of participants reported having at least one comorbid condition (defined as having either hypo/hypertension, asthma, heart disease, gastritis, stroke, hand tremors, gout, rheumatoid arthritis, vertigo and cataracts), 44% experienced loose stools and 17% reported self-defined constipation.

Prevalence rate of faecal incontinence

Incontinence of loose/liquid and solid stool occurred in 20.5% (95% CI 16.2-24.8) [21] and 15.5% (95% CI 11.6-19.4) [21] of participants respectively in a three month time frame. The overall prevalence rate of faecal incontinence was 22.4% (95% CI 18.0-26.8) [21].

Bowel control

Out of 68 participants with faecal incontinence, 38% of them experienced unexplained incontinence, when they had bowel accidents without sensing any urge, and 48% were unable to predict the occurrence of bowel accidents. Both percentages reflect reporting of at least rarely occurrences (refer to Table 2).

Associated factors with faecal incontinence

The bivariate analyses of factors potentially associated with faecal incontinence indicated that advancing age, loose stools, self-reported constipation and having any of the predefined comorbid conditions were significantly associated with faecal incontinence. Selection of statistical tests and effect size measures are reported in Table 3. It is important to highlight that effect size of all significantly associated factors were small (less than 0.3) which indicated weak association [19]. As pointed in Table 3: gender, gastrointestinal surgery, anal injury other than delivery related, anal pain, medications and Rome III defined constipation were not significantly associated with faecal incontinence. In females, the number of vaginal delivery was not significantly associated with faecal incontinence.

Multivariate logistic regression was performed to assess the impact of a number of factors on the likelihood that respondents experienced faecal incontinence. The model contained four independent variables (loose stools, comorbid condition, age and self-reported constipation). The full model containing all predictors was statistically significant, $\chi^2(4, N=303) = 37.47$, $p < 0.001$, indicating that the model was able to distinguish between respondents who

experienced and did not experience faecal incontinence in the past three months. The model as a whole explained between 12% (Cox and Snell R Square) and 18% (Nagelkerke R Square) of the variance in faecal incontinence, and correctly classified 78% of cases (sensitivity=19%, specificity=96%). As shown in Table 4, only two independent variables (self-reported constipation and loose stools) made a unique statistically significant contribution to the model. The strongest predictor of faecal incontinence was self-reported constipation, recording an odds ratio of 3.68. This indicated that respondents who perceived themselves as being constipated were around 4 times as likely to experienced faecal incontinence than respondents reporting being non-constipated, controlling for all other factors in the model. The second predictor of faecal incontinence was loose stools, recording an odds ratio of 2.66. Two way interactions were also checked, but none found to be significant.

Quality of life

A higher number of participants with faecal incontinence reported various degrees of interference with their quality of life (Table 5). There was a strong positive correlation [19] between total bowel control scores and the total quality of life scores of older people ($p < 0.001$, $r_s = 0.61$).

Current management practices

Forty two out of 68 participants with faecal incontinence currently managed their problems. While some participants utilized multiple management practices, the majority of them (34%) reported diet changes, followed by the use of medications to stop their bowel opening, visit to a health care unit, the use of traditional herbal medicines and consumption of laxatives.

Discussion

The overall prevalence rate of faecal incontinence identified in this study was relatively higher than that reported in previous population-based studies on community-dwelling older people in Western countries [5,6], but within the range of the prevalence rate in residential aged care facilities [7,8]. A number of factors may contribute to the result. First, populations under these studies differ. As institutionalized aged care in Indonesia is underdeveloped, the present study included a population that would probably be admitted to aged care facilities in Western countries [3,4]. Although the median age of the population in this study is younger than that of institutionalized populations [7,8], this may be influenced by the different life expectancy between Indonesia and other developed countries. The estimated life expectancy is 70.7 in Indonesia and 82.4 Australia between 2010 and 2015 [22]. Second, participants in the present study were given an opportunity to enrol in the study and sampling bias was most likely present. It is possible that those who had bowel problems were more likely to choose to participate in the study. Third, the high prevalence rate of faecal incontinence along with other health issues reported by participants in the study including anal pain or soreness, loose stool and constipation may be an indicator of poor health in a developing country. The disparity of population health between developing and developed countries is evidenced by the fact that the mortality rate of non-communicable disease was about twice higher in Indonesia than that in Australia in 2008 [23].

The positive association between advancing age and increased prevalence rates of faecal incontinence identified in the present study and in a previous study [9] suggests that studying faecal incontinence in this population is imperative in order to inform health care services to tackle this health issue in community settings. Some studies reported memory/cognition problems [24], physical disability [25], and functional incapacity [7] as potentially associated factors for faecal incontinence in older people. However, to keep the length of interviews

within acceptable timeframes for participants in the current study, data related to these associated factors was not measured.

The association between constipation and faecal incontinence remains unclear. Previous studies report inconsistent relationships between faecal incontinence and self-reported constipation [26,27]. There appears to be no study has assessed the relationship between faecal incontinence and clinically defined constipation in older populations. This current study found self-reported constipation was significantly associated with faecal incontinence. However, having constipation as defined by Rome III criteria was not associated with faecal incontinence. It is not clear from the current study what symptoms defined self-reported constipation in this older population that might be associated with faecal incontinence.

Loose stools are reported as a significant factor for faecal incontinence in older people because loose stools are more difficult to control than solid stools [6]. Consistent with previous findings, the present study also identified loose stools as a predictor for faecal incontinence, and the prevalence of loose stool incontinence was higher than solid stool incontinence. These findings support the current practice of diarrhoea treatment as an effective method for reducing the prevalence and severity of faecal incontinence [28].

Previous research indicates significant impairment in the quality of life of adults with faecal incontinence [9]. This current study demonstrated that the quality of life of older people was affected by faecal incontinence. Although feeling embarrassed was not very common for those with faecal incontinence, a very significant proportion of older people with faecal incontinence reported staying home more often than they would like. In the Indonesian culture, older people remain socially active in the community mainly for various religious events, visiting friends and families [1]. Addressing these social needs may be a high priority for the management of faecal incontinence for community-dwelling older adults in Indonesia.

There is evidence for the use of modern medications such as anti-diarrheal medications for diarrheal-associated faecal incontinence [29] and laxatives for constipation-associated faecal incontinence [30]. However, there is currently no evidence on the effectiveness of traditional herbal medicine for faecal incontinence. The underutilization of health care services along with the use of traditional herbal medicines found in this current study may indicate the influence of health beliefs, the lack of social security and limited health information around treatment and management of faecal incontinence. This finding suggests a need to increase an awareness of faecal incontinence including information of the problem, factors associated and available treatment and management options for older people and their family care givers. Investigation of the effectiveness of the traditional medicines used by participants needs to be determined. Likewise, we need to determine whether preference for their use is influenced by low utilization of health care.

Despite some method strengths of the cross-sectional population-based study, such as a clearly-defined study population, and the use of probability sampling and a reliable and valid questionnaire, the present study has some limitations. The cross-sectional study provided only a snapshot of the problem of faecal incontinence based on a single period of observation. This is, however, the first study in Indonesia designed to explore the prevalence of faecal incontinence in community-dwelling older people and the current management practices for faecal incontinence. The response rate of this study was low (51%) and this might have contributed to sampling bias in this study. Therefore, sample may not be representative to the wider population of older people in Indonesia in general, which limits the generalization of the findings.

Conclusion

Faecal incontinence affects 22.4% of community-dwelling older people in Bali, Indonesia, with significant impact on quality of life. Findings in this current study will inform healthcare professionals to plan and improve community care for older people in Indonesia especially in the treatment and management of faecal incontinence.

Key Points

- This is the first study in Indonesia exploring prevalence rate of faecal incontinence in community-dwelling older people.
- Loose stool was a risk factor for faecal incontinence; and the prevalence of incontinence of loose stool was slightly higher than the prevalence of incontinence of solid stool. These findings support the current practice of diarrhoea treatment as an effective method for reducing the prevalence and severity of faecal incontinence.
- Faecal incontinence affected quality of life of older people with a very significant proportion of older people with faecal incontinence reported staying home more often than they would like. Addressing social needs for those with faecal incontinence may be a high priority for the management of faecal incontinence for community-dwelling older adults in Indonesia.
- There is a need to increase an awareness of faecal incontinence including information of the problem, factors associated and available treatment and management options for older people and their family caregivers to support an adequate management of faecal incontinence in the community.

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