Depression among older people living in the community with urinary, fecal, and double incontinence in Bali, Indonesia: a secondary data analysis

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Abstract

Depression and incontinence in older people living at home have become a global issue; however, the research around this area is limited in Indonesia. This study aimed to determine the prevalence of depression among older people with Urinary Incontinence (UI), Fecal Incontinence (FI), and Double Incontinence (DI) in Indonesia. This study used data from a community project dataset for case management processes in older people in an urban area of Bali in 2022. The dataset used was 970 older people aged 60+. We measured six variables in our study: age, gender, depression, UI, FI, and DI. A multivariate logistic regression analysis was conducted to explore the determinants of depression in older people. Most respondents were female (55.3%). Findings showed that the prevalence of depression, urinary, fecal, and double incontinence were 8.0%, 4.7%, 9.1%, and 2.8%, respectively. Depression was associated with age and all types of incontinence, but not gender. Logistic regression showed that the strongest predictor of depression in older people was FI (OR 3.151), followed by age, with OR 2.243. Nurses and other health workers should conduct more active screening for depression and incontinence for better management of these global health issues.

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Introduction

One of the most prevalent mental health conditions affecting older persons globally is depression, which has a significant negative impact on general well-being, functional status, and quality of life.[1] Although prevalence rates vary by population and diagnostic criteria, depression in older people living at home in Indonesia affects between 11.8% and 13.6% of those 60 years and older.[2,3] Emerging research highlights incontinence as a significant yet underappreciated component of the multiple reasons for depression in older people, which range from social isolation and chronic illnesses to cognitive impairment. In older populations, psychological distress and depressive symptoms have been linked to Fecal Incontinence (FI) – defined as the involuntary loss of stool, Urinary Incontinence (UI) – defined as the involuntary loss of urine, as well as their co-occurrence, known as Double Incontinence (DI),[4-7] in addition to gender (female) and advancing age.

UI affects up to 27% of older adults living in the community and at much greater rates in institutionalized populations, making it a prevalent condition among older adults.[8,9] Despite being less common, FI affects around 8% of older adults,[10] and a significant percentage of long-term care patients experience DI, which is when FI co-occurs with UI.[11] In addition to causing a physical and hygienic burden, incontinence also leads to social disengagement, humiliation, and embarrassment – all of which are closely related to the development and maintenance of depressed moods.

There are multiple ways in which depression and UI in older persons are associated. First, UI can cause severe psychological problems because of its stigma and perceived loss of dignity.[12] Second, because UI is chronic and frequently progressive, it may cause ongoing tension and anxiety, which can create an atmo-

sphere that is favorable for the emergence of depressive symptoms. According to studies, older persons with UI have a much higher likelihood of having depressive symptoms than their contemporaries on the continent; odds ratios vary from 2.3 to 3.8 based on the context and the severity of symptoms.[13]

DI is the most severe type of incontinence-related morbidity. In addition to raising the likelihood of institutionalization and the care burden, DI also exacerbates the psychological toll, which frequently results in worsened mental health issues, such as elevated rates of anxiety and depression. Although DI is comparatively less common in the general population, its frequency rises with age, frailty, and the presence of neurological illnesses like dementia and stroke,[14] which are linked to an increased risk of depression.

Although less research has been done, FI is just as devastating as UI. Many older people with FI view the inability to control their bowels as even more stigmatizing than urine leakage, which frequently leads to higher psychological impact and more severe social isolation.[15] Studies indicate that the shame and challenges associated with managing bowel incontinence worsen depressive symptomatology, and FI has been associated with greater depression scores.[5]

Even though incontinence and depression are firmly linked, little is known about the precise prevalence of depression in older persons with various forms of incontinence. There are still numerous unanswered questions regarding the relationship between the multiple forms of incontinence and the prevalence of depression in older persons, although these correlations are becoming increasingly acknowledged. Most existing studies examine either UI or FI in isolation, without accounting for the nuanced differences between these conditions or their compounding effects when they co-occur. Because of this, the current study aims to determine the prevalence of depression in older persons living in the community who have UI, FI, and DI, as a secondary data analysis using data from a community project dataset for case management processes in older people in an urban area of Bali in 2022. By identifying the prevalence and correlations of depression within these subgroups, the findings are expected to inform primary care strategies and public health policies tailored to the needs of aging populations. The study also seeks to contribute to the global discourse on geriatric mental health by providing context-specific evidence from a middle-income, Southeast Asian setting.

Materials and Methods

Study design

This study is a type of secondary data research. It used a dataset from a community project on case management processes for older people in an urban area of Bali to determine the factors related to depression in older people.

Data source and sampling procedure

This study used a dataset from a community project on case management processes for older people in an urban area of Bali in 2022. This is the only urban site in Bali possessing this type of data. The data set was collected cross-sectionally by interviewing older people in the area from August to September 2022. Sampling was conducted by analyzing individual data from the target population, individuals aged 60+. The total sample was 970 older people.

Variables of the study

Variables of this study were derived from 2 validated questionnaires: the Barthel Index and the 5-item Geriatric Depression Scale. The questions on the Barthel Index of bladder were used to measure UI,[16] and the question on bowel was used to measure FI. We classified respondents as experiencing UI if the respondent answered either "incontinence" or "occasional accident in the last 7 days" to the question of "bladder". Similarly, we classified respondents as experiencing FI if the respondent answered either "incontinence" or "occasional accident in the last 7 days" to the question of "bowel". Meanwhile, respondents were classified as experiencing DI if, simultaneously, she or he experienced both UI and FI. These classification methods are considered acceptable in studies on incontinence and have been adopted a previous study.[8] Depression was measured using the 5-item Geriatric Depression Scale.[17] Scores of 2 and above were considered indicative of depression.

Data analysis

We conducted data cleaning to check for inconsistencies and missing data. Bivariate and multivariate analyses were performed. Bivariate analyses were performed using a chi-squared test with Fisher's test as an alternative when appropriate (Table 1), to determine the relationship of each independent variable for depression, including age, gender, UI, Fi, and DI. Effect sizes were calculated and reported as a phi coefficient. Multivariable analysis was conducted using a logistic regression to identify independent variables associated with depression, while identifying the most dominant variables related to depression with a confidence interval of 95% CI. Only the variable with $p>0.25$ from the bivariate statistic entered the multivariate model (Table 2). All statistical analyses were two-tailed, with statistical significance defined as $p<0.05$. Statistical analyses for this study were conducted using SPSS version 27.

Ethical consideration

This study is a secondary data analysis, and the dataset was used with permission from the community project on case management processes for older people in an urban area of Bali in 2022.The Research Ethics Committee of the Institute of Technology and Health Bali granted ethical approval with the number 04.0466/KEPITEKES-BALI/VII/2022.

Results

We found no missing data in the dataset. Most respondents were female (55.3%), and their ages ranged from 60 to 96. Only 0.9% live alone (Table 3). The prevalence of depression, urinary, fecal, and double incontinence was 8.0%, 4.7%, 9.1%, and 2.8%, respectively (Table 4). Interestingly, 42.7% of respondents preferred to stay home more often, 41.3% showed dissatisfaction with their own life, 13.1% felt bored, and 5.9% felt helpless (Table 5). Based on bivariate analyses, depression was associated with age ($p<0.001$, φ 0.130), all types of incontinence with a small effect size (UI: $p=0.002$, φ 0.112; FI: $p<0.001$, φ 0.157; DI: $p=0.004$, φ 0.111). Depression was not associated with gender (Table 3).

Direct logistic regression was performed to assess the impact of several factors on the likelihood that respondents had depression. The model contained four independent variables (age, UI, FI, and DI). The model containing all predictors was statistically significant for ADLs, χ^2 (4, N = 970) =29.45, $p<0.001$, indicating that

Table 1. Bivariate analyses of depression among older people with urinary, fecal, and double incontinence (*n*=970).

Variable	Categories	Depression		p	Effect size (φ)
		No n (%)	Yes n (%)		
Age	60-74	722 (80.9)	48 (61.5)	<0.001§	0.130
	75+	170 (19.1)	30 (38.5)		
Gender	Male	396 (44.4)	38 (48.7)	0.462§	0.024
	Female	496 (55.6)	40 (51.3)		
Urinary incontinence	No	856 (96.0)	68 (87.2)	0.002¶	0.112
	Yes	36 (4.0)	10 (12.8)		
Fecal incontinence	No	823 (92.3)	59 (75.6)	<0.001§	0.157
	Yes	69 (7.7)	19 (24.4)		
Double incontinence	No	872 (97.8)	71 (91.0)	0.004¶	0.111
	Yes	20 (2.2)	7 (9.0)		

§Chi square; ¶Fischer exact test.

Table 2. Logistic regression of determinant factors of depression among older people (*n*=970).

	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B)	
							Lower	Upper
Age	0.808	0.257	9.883	1	0.002	2.243	1.355	3.710
Urinary incontinence	-0.751	0.655	1.313	1	0.252	0.472	0.131	1.705
Fecal incontinence	1.148	0.356	10.389	1	0.001	3.151	1.568	6.333
Double incontinence	0.514	0.855	0.361	1	0.548	1.671	0.313	8.926
Constant	-2.626	0.581	20.404	1	0.000	0.072		

Table 3. Demographic characteristics of older people living in an urban area of Bali (*n*=970).

Variable	Categories	n	%
Age	60-74	770	79.4
	75+	200	20.6
Gender	Male	434	44.7
	Female	536	55.3
Living arrangement	With family	961	99.1
	Alone	9	0.9

Table 4. Prevalence of depression, urinary, fecal, and double incontinence among older people living in an urban area of Bali (*n*=970).

Item	Yes n (%)	No n (%)
Urinary incontinence	46 (4.7)	924 (95.3)
Fecal incontinence	88 (9.1)	882 (90.9)
Double incontinence	27 (2.8)	943 (97.2)
Depression	78 (8.0)	892 (92.0)

Table 5. Frequency of depression among older people living in an urban area in Bali (*n*=970).

Item	Yes n (%)	No n (%)
Satisfaction with own life	569 (58.7)	401 (41.3)
Feel bored	127 (13.1)	843 (86.9)
Feel helpless	57 (5.9)	913 (94.1)
Stay home	414 (42.7)	556 (57.3)
Feel worthless	33 (3.4)	937 (96.6)

the model could distinguish between respondents with and without depression. The model explained between 3% (Cox and Snell R square) and 7% (Nagelkerke R squared) of the variance in depression and correctly classified 92% of cases. As shown in Table 2, only two independent variables made a unique statistically significant contribution to the model (age and FI). The strongest predictor of depression in older people was FI, recording an odds ratio of 3.151. This indicated that respondents with FI were over 3.1 times more likely to experience depression, controlling all other factors in the model. The second strongest variable was age, with an odds ratio of 2.243.

Discussion

This study aimed to determine the prevalence of depression among older people with urinary, fecal, and double incontinence in Indonesia. In addition, this study also explored the determinant factors of depression based on age and all types of incontinence. This study provides essential insight into the intricate relationships that exist between depression, UI, FI, and DI in Indonesian older individuals. The results show a strong and statistically significant correlation between older adults' higher levels of depressive symptoms and incontinence, especially FI. This emphasizes how critical it is to acknowledge incontinence as a psychological and mental health problem in addition to a physical one, especially in older adults living in culturally conservative settings.

In contrast to previous studies, our findings show a higher prevalence of FI among the study population, which differs from prior global and regional research that frequently identifies UI as the more common kind of incontinence in older persons.[18,19] This disparity could be caused by several factors, as revealed in a previous study, such as respondents misclassifying UI, stigma-induced underreporting, or different trends in health-seeking behavior.[20,21] Those with UI tend to hide the symptoms because it is considered embarrassing, resulting in an underreporting of UI symptoms. Given its stronger correlation with depression, the increased prevalence of FI is very significant. This suggests that Indonesia's public health and older people care initiatives must pay more attention to this disorder. Despite being less common than UI and FI, as also reported by previous studies,[22,23] DI is associated with depression based on bivariate statistics, although not as a determinant factor in the multivariate analysis. This could be explained by the fact that statistically, in the data set, only 9% of those with DI experience depression compared to 24.4% in FI and 12.8% in UI. When all variables are simultaneously entered into logistic regression models, only UI and FI contribute significantly to depression. Further study using a bigger sample size may be required to test the relation between depression and DI.

Compared to their peers on the continent, older persons with incontinence of any kind had a much greater overall prevalence of depression.[24,25] The evidence that incontinence and psychological discomfort are related is further supported by this trend. Our results, however, go beyond confirmation and provide new evidence that FI is the most powerful predictor of depression, outperforming UI and even DI. The greater degree of embarrassment, discomfort, and practical difficulties related to managing fecal loss may account for the very significant correlation between FI and depression. FI is viewed as highly embarrassing and spiritually filthy in many Asian communities, particularly those in Indonesia. This stigma frequently results in social disengagement, self-isolation, and withdrawal from communal and religious activities, essential sources of identity and purpose for older Indonesians.[26] FI tends to be less publicly discussed, poorly managed, and linked to more negative self-perceptions than UI, which may be more understood and somewhat more accepted. Embarrassment and worry are made worse by the visibility of fecal accidents, their unpleasant odor, and the intricate care needed. Therefore, it's possible that older adults with FI feel more control and dignity lost, which makes them more susceptible to sadness. From a biological standpoint, neurological or muscular degeneration, which is frequently linked to advanced ageing, chronic illnesses like diabetes or stroke, or long-term pharmaceutical use, may also be connected to the severity of FI.[27] These disorders are also associated with depression, resulting in a complex feedback loop that exacerbates psychological deterioration.

In this study, age was found to be the second predictor of depression. Depressive symptoms were more common in older age groups, especially those 75 years of age and older. This pattern is in accordance with the trajectory of functional decline as well as the rising incidence of dependency, loneliness, and chronic illnesses in later life.[28-30] The inability of older persons to preserve their independence, engage in community activities, and practice basic self-care is exacerbated by incontinence, whether it be UI, FI, or DI. Furthermore, there is a cultural component to the relationship between incontinence and ageing in Indonesia. Ageing gracefully and calmly is expected in many communities. Therefore, the development of incontinence in later life may be interpreted as a social departure as well as a medical alteration, leading to emotions of guilt, stress, or even spiritual failure. This relationship is especially noticeable for elderly women, who frequently internalize their caring responsibilities and experience more emotional distress when confronted with physical constraints.[30]

FI is a stigmatized condition.[20] In line with previous studies,[12,15] the impact of social stigma on the connection between depression and incontinence is one of the main issues that this study has revealed. Bowel and bladder control problems are frequently taboo subjects in Indonesian society, particularly among senior citizens. Silence about these problems can result in poor self-care practices, a lack of medical or social support, and delays in diagnosis. Many elderly people suffer in quiet as a result, which raises their risk of depression.

The findings from this study have important implications for healthcare practice for older persons in Indonesia. First and foremost, regular screening for depression and incontinence must be incorporated into primary healthcare services for older people. Because of their accessibility and community-based methodology, community health centers (*Puskesmas*) and *Posyandu lansia* (elderly integrated service posts) make early identification and intervention venues. Second, healthcare providers, especially nurses, general practitioners, and community health workers, must be trained to understand the psychological effects of incontinence. Beyond treating symptoms, interventions should also involve patient education, emotional support, and counselling sensitive to cultural differences. Thirdly, national health policies should give incontinence management and elderly mental health top priority as interconnected public health issues. The public health system in Indonesia does not adequately handle adult incontinence, and senior mental health services are inadequate. Increasing insurance coverage for mental health therapies and incontinence products could significantly enhance the lives of those impacted. Programs for carer support and community-based mental health promotion could potentially lessen the impact of depression on senior citizens. Family carers, who frequently act as the first line of care, should be equipped with the skills and information necessary to

manage elderly people who are incontinent or depressed in a kind and efficient manner. While this study provides novel insights, several limitations must be acknowledged. First, this secondary analysis from a cross-sectional design limits causal inference. While incontinence appears to be associated with higher depression levels, the reverse may also be true; depression may contribute to reduced self-care and worsening incontinence. Longitudinal studies are needed to better understand directionality. Second, self-reported measures of incontinence and depression may be subject to recall and social desirability bias, especially given cultural sensitivities. Future research should incorporate objective clinical assessments and qualitative interviews to triangulate findings. Third, other potentially significant factors that could influence the link between incontinence and depression, such as socioeconomic status, carer burden, comorbidities, and health literacy, were not taken into consideration in this study. A more thorough, multifaceted framework should be used in future studies to investigate these intersections. Fourth, this study was conducted based on a data set collected from one village in Bali. Generalization for a broader population may be limited.

Conclusions

This study emphasizes how critical it is to treat the psychosocial aspects of incontinence in older Indonesian individuals. The correlation between depression and incontinence, specifically FI, is evident and strong and necessitates a multifaceted approach. Indonesia can enhance its rapidly aging population's well-being and quality of life by encouraging culturally responsive care models, de-stigmatizing incontinence, and including mental health into geriatric care. Such research can be used as a basis for inclusive, evidence-based, and culturally grounded public health interventions as the nation navigates the difficulties of demographic transition.

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