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# Depression and Urinary Incontinence in Older Adults: A Cross-Sectional

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## Abstract

**Introduction:** Depression and urinary incontinence are common and often co-occurring conditions in older adults, both of which significantly reduce quality of life. Depression may exacerbate urinary incontinence through mechanisms such as pelvic floor muscle weakness, bladder overactivity, and medication side effects. This study examined the association between depression levels and urinary incontinence among older adults.

**Methods:** A cross-sectional study was conducted on February 23, 2025, in Banjar Cepaka, Bali. Forty older adults meeting the inclusion and exclusion criteria were recruited through purposive sampling. Depression was assessed using the 15-item Geriatric Depression Scale (GDS-15), while urinary incontinence was evaluated with the International Consultation on Incontinence Questionnaire–Urinary Incontinence Short Form (ICIQ-UI SF). Data analysis was performed using the Spearman rank correlation test.

**Results:** A statistically significant association was found between depression and urinary incontinence ($p = 0.000$, $p < 0.05$), with a Spearman correlation coefficient of 0.753, indicating a very strong positive correlation.

**Conclusion:** Depression is strongly associated with urinary incontinence in older adults. These findings underscore the need for integrated mental and physical health assessments in geriatric care. Future studies with larger, more diverse populations are warranted to investigate additional influencing factors such as age, physical activity, and quality of life.

## Keywords

Depression, urinary incontinence, aged, cross-sectional studies, geriatric assessment

## Introduction

Indonesia is a developing country experiencing a rapid increase in its older adult population, as indicated by a rising proportion of elderly individuals.[1] Older adults (elderly) are defined as individuals aged 60 years and above, regardless of gender or occupational status.[2] According to the Central Bureau of Statistics (Badan Pusat Statistik), in 2020 the percentage of older adults in Indonesia reached 26.82 million people (9.92%). Six provinces have already entered the aging population phase, where the proportion of older adults exceeds 10%.

The aging process typically affects bodily mechanisms and functions, gradually leading to a general decline in overall health. One of the mental health consequences of aging is depression. The prevalence of depression among older adults in Indonesia is reported at 15.9% in those aged 55–64 years, 23.2% in those aged 65–74 years, and 33.7% in individuals over 75 years.[3] Depression is a common mental disorder characterized by sadness, loss of interest or pleasure, feelings of guilt or low self-worth, sleep disturbances, appetite changes, fatigue, and difficulty concentrating.[4] It is also considered a serious mental health condition that can affect physical functioning and quality of life. Loneliness, loss, and emotional stress increase the risk of depression in older adults, which may subsequently lead to urinary incontinence.

Depression can contribute to urinary incontinence through several mechanisms. First, the pelvic floor muscles that support the bladder may weaken. Second, bladder contractions may become abnormal. Third, diuretic medications and bladder inflammation can also contribute.[5] The use of diuretics is known to trigger or worsen urinary incontinence symptoms, particularly in patients with urgency urinary incontinence (UI) and mixed UI. More than one-third of patients with mixed UI avoid diuretic use due to bothersome urinary symptoms.[6] Limited social support is also a key factor, as lack of social interaction can worsen feelings of loneliness and isolation, increasing the risk of depression. Additionally, personality traits and previous mental health history may influence an older person's vulnerability to depression. Urinary incontinence itself can be a source of added stress, creating a negative cycle in which depression exacerbates physical conditions, and poor physical health worsens depressive symptoms.[7]

There is a bidirectional relationship between depression and urinary incontinence, possibly involving shared biological mechanisms. Serotonin dysfunction is believed to play a role in the development of both conditions. Furthermore, increased sympathetic nervous system activity due to depression can elevate cortisol and catecholamine levels, which may trigger physiological changes in the bladder and worsen urinary incontinence symptoms.[6]

A previous study by Agustina et al. conducted at the Panti Sosial Tresna Werdha Budi Sejahtera in Banjarbaru found a significant association between depression levels and urinary incontinence in older adults. Thirty-seven percent of respondents had mild depression, and 54.3% experienced moderate urinary incontinence, indicating that depression may increase the risk of urinary incontinence.[7] Another study by Iwan et al. at the Alkautsar Foundation in Palu also reported a significant relationship between depression scores and urinary incontinence among older adults, confirming that depression has a notable impact on urinary incontinence in this population.[8]

This research is important given the demographic transition currently taking place in Indonesia, where the elderly population is growing rapidly. Previous studies have demonstrated an association between depression and urinary incontinence in institutionalized older adults in nursing homes and foundations. However, these studies may not represent the general older adult population living in community settings.

The sociocultural context of Banjar Cepaka may influence how older adults perceive and respond to psychological conditions such as depression, as well as physical conditions like urinary incontinence. In local cultural settings, mood disorders among the elderly are often unrecognized or perceived as a normal part of aging, while urinary symptoms are considered taboo and not openly discussed. This can lead to underreporting of symptoms and delays in seeking appropriate care.

Therefore, this study is essential at the community level, particularly in Banjar Cepaka. It aims to analyze the association between depression level, assessed using the Geriatric Depression Scale-15 (GDS-15), and the occurrence of urinary incontinence, measured by the International Consultation on Incontinence Questionnaire–Urinary Incontinence Short Form (ICIQ-UI SF), among older adults in the Banjar Cepaka community.

## Methods

This study employed an observational design using a cross-sectional approach conducted in Banjar Cepaka on February 23, 2025. Data collection was carried out using purposive sampling, which falls under the category of non-probability sampling.

A total of 40 older adults who met the inclusion and exclusion criteria participated in this study. The inclusion criteria were: voluntary willingness to participate from beginning to end by signing an informed consent form, male or female older adults aged 60–90 years who were capable of understanding and participating in the study procedures, and who did not have hearing impairments. The exclusion criteria included speech disorders and comorbidities such as spinal cord injuries or pelvic trauma.

The variables in this study consisted of depression level as the independent variable, urinary incontinence as the dependent variable, and age and gender as control variables. Age and gender were analyzed descriptively and were not included in the bivariate analysis.

Depression level was assessed using the Geriatric Depression Scale–15 (GDS-15), a questionnaire with high validity (0.81) and reliability (0.80), indicating strong measurement accuracy. The GDS-15 contains 15 items with a maximum score of 15. Interpretation of the scores is categorized as follows: normal (0–4), mild depression (5–8), moderate depression (9–11), and severe depression (12–15).

Urinary incontinence was measured using the International Consultation on Incontinence Questionnaire–Urinary Incontinence Short Form (ICIQ-UI SF), which has excellent validity (0.89) and reliability (0.88). This instrument consists of four items, each scored individually, with a total maximum score of 21. Interpretation of the total score is categorized into five groups: normal (0), mild urinary incontinence (1–5), moderate (6–12), severe (13–18), and very severe (19–21).

Data analysis was performed using SPSS version 26.0. Descriptive statistics were used to summarize participants' characteristics by age and gender. Univariate analysis was conducted to describe the frequency distribution of depression levels and urinary incontinence. Bivariate analysis using Spearman rank correlation was performed to examine the relationship between depression level and urinary incontinence.

No missing data were identified during the data collection process, as all respondents completed the questionnaires with the assistance of trained enumerators. Potential confounding variables such as age and gender were only analyzed descriptively and were not statistically controlled in the inferential analysis.

## Results

A total of 40 older adults from Banjar Cepaka were purposively recruited and all met the inclusion and exclusion criteria. All participants completed the entire set of questionnaires without missing data or withdrawal from the study. The subject identification process is illustrated in Figure 1. Table 1 displays the demographic and clinical characteristics of the study sample.

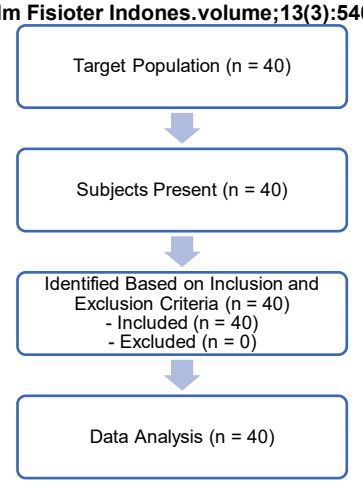


**Figure 1.** Identification Flow of Study Participants

**Table 1.** Sample Characteristics

| Characteristic | Frequency (n) | Percentage (%) |
|---|---|---|
| Sex | | |
| Male | 14 | 35.0% |
| Female | 26 | 65.0% |
| Total | 40 | 100.0% |
| Age Group | | |
| 60–64 years | 9 | 22.5% |
| 65–69 years | 14 | 35.0% |
| 70–74 years | 5 | 12.5% |
| 75–79 years | 5 | 12.5% |
| ≥ 80 years | 7 | 17.5% |
| Total | 40 | 100.0% |

As shown in Table 1, the majority of participants were female (n = 26; 65.0%), compared to males (n = 14; 35.0%). In terms of age distribution, the largest group was aged 65–69 years (n = 14; 35.0%), followed by 60–64 years (n = 9; 22.5%), ≥ 80 years (n = 7; 17.5%), 70–74 years (n = 5; 12.5%), and 75–79 years (n = 5; 12.5%). No missing data were found in demographic or questionnaire responses. Table 2 outlines the distribution of depression levels among the elderly participants.

**Table 2.** Distribution of Depression Levels

| Depression Level | Frequency (n) | Percentage (%) |
|---|---|---|
| Normal | 10 | 25.0% |
| Mild | 11 | 27.5% |
| Moderate | 14 | 35.0% |
| Severe | 5 | 12.5% |
| Total | 40 | 100.0% |

Table 2 shows that the majority of participants exhibited moderate levels of depression (35.0%), followed by mild (27.5%), normal (25.0%), and severe depression (12.5%). These findings indicate that more than half of the older adults experienced depressive symptoms, with moderate severity being the most prevalent. Table 3 presents the distribution of urinary incontinence severity.

**Table 3.** Distribution of Urinary Incontinence Severity

| Incontinence Severity | Frequency (n) | Percentage (%) |
|---|---|---|
| Normal | 10 | 25.0% |
| Mild | 11 | 27.5% |
| Moderate | 14 | 35.0% |
| Severe | 5 | 12.5% |
| Total | 40 | 100.0% |

As seen in Table 3, most participants were classified as having moderate urinary incontinence (35.0%), followed by mild (27.5%), normal (25.0%), and severe (12.5%). This suggests that urinary incontinence symptoms were common among the older adults, with varying degrees of severity. Table 4 shows the cross-tabulation between depression levels and urinary incontinence severity, providing a descriptive overview of their potential association.

**Table 4.** Cross-tabulation of Depression Level and Urinary Incontinence

| Depression Level | Normal UI | Mild UI | Moderate UI | Severe UI | Total |
|---|---|---|---|---|---|
| Normal | 9 | 0 | 0 | 1 | 10 |
| Mild | 0 | 10 | 1 | 0 | 11 |
| Moderate | 0 | 1 | 13 | 0 | 14 |
| Severe | 1 | 0 | 0 | 4 | 5 |
| Total | 10 | 11 | 14 | 5 | 40 |

Table 4 illustrates the relationship between depression levels and urinary incontinence (UI) severity. Among participants with moderate depression, the majority (n = 13) had moderate UI. Those without depression mostly had no UI (n = 9). Participants with mild depression predominantly experienced mild UI (n = 10), while most individuals with severe depression had severe UI (n = 4). These findings suggest a trend in which higher depression levels are associated with greater severity of urinary incontinence. Table 5 summarizes the results of the Spearman's rank correlation analysis, highlighting the strength and direction of the relationship between depression and urinary incontinence.

**Table 5.** Spearman's Rank Correlation Between Depression and Urinary Incontinence

| Variable Correlation | r | p-value |
|---|---|---|
| Depression – Incontinence | 0.753 | 0.000 |

Table 5 presents the results of Spearman's rank correlation analysis. A strong positive correlation was found between depression levels and urinary incontinence severity ($r = 0.753$; $p < 0.05$). This indicates that as depression levels increase, the likelihood and severity of urinary incontinence also increase. The statistical significance ($p = 0.000$) confirms the robustness of this association.

## Discussion

### Respondent Characteristics

The majority of respondents in this study were aged 65–69 years (14 respondents), followed by 60–64 years (9 respondents), ≥ 80 years (7 respondents), and 75–79 years (5 respondents). This suggests that age may be a contributing factor to depression among older adults. As individuals age, they are more vulnerable to physical, psychological, and social changes that can increase the risk of depression. Aging is often accompanied by a decline in physical function, reduced physical activity, and increased dependency on others, potentially leading to feelings of helplessness and loneliness.[9]

In terms of gender, 14 respondents were male and 26 were female. This study found that females experienced higher levels of depression compared to males. This aligns with previous findings suggesting that women are at greater risk of depression, particularly in older age. A previous study showed that among older adults with depression, the majority were women (42 respondents or 35.2%), while only 7 were men (13.8%).[10]

Biological, hormonal, and psychosocial differences contribute to the higher risk of depression among women. Physiologically, hormonal changes during puberty, menstruation, pregnancy, and menopause may increase susceptibility to mood disorders. According to Hyde et al., women are more prone to internalizing emotional stress, leading to a heightened risk of depression.[11]

### Distribution of Depression Levels and Urinary Incontinence

Depression levels among respondents in Banjar Cepaka were predominantly moderate (14 respondents), followed by mild (11 respondents), normal (10 respondents), and severe (5 respondents). This indicates a high prevalence of depressive symptoms among the older adult population in the area. Contributing factors may include advancing age, physical decline, and lack of daily physical and social activity.

Nurjanah and Nuraeni found that aging increases vulnerability to psychological disorders, including depression. Similarly, Maulidya and Suryani reported that depression in older adults can be triggered by social role changes, physical decline, and reduced daily activity.[12] Low levels of physical activity are also closely associated with depression, as physically inactive older adults are more likely to experience loneliness, helplessness, and a diminished sense of life purpose.[13]

Urinary incontinence levels were also predominantly moderate (14 respondents), followed by mild (11 respondents), normal (10 respondents), and severe (5 respondents). These findings suggest a varied distribution of urinary incontinence severity among respondents. One potential contributing factor is low physical activity. According to Ivanali et al., older adults with low physical activity levels are more likely to experience urinary incontinence, as the pelvic floor muscles involved in urinary control weaken due to a lack of movement and exercise.[14]

### Physiological and Psychological Explanations

Depression is a common psychological disorder among the elderly and significantly affects their quality of life. With aging, physiological changes such as reduced muscle elasticity and joint stiffness may restrict mobility, hindering daily activities and reducing independence. This may lead to increased dependency and diminished self-worth. Such physical changes are among the primary risk factors for depression in older adults.[15]

Depression affects not only emotional well-being but also physiological and psychological aspects crucial for bodily function. Psychologically, depression may reduce motivation for self-care, including managing urinary incontinence. Physiologically, it may impair the central and autonomic nervous systems responsible for bladder control, leading to altered muscle tone and nerve function.[16]

These disruptions result in irregular and poorly controlled urination reflexes, increasing the risk of incontinence. Moreover, depressed older adults often experience declines in personal hygiene routines, including urinary control, which may exacerbate their condition. These factors support the conclusion that a significant relationship exists between depression levels and urinary incontinence in older adults.[17]

**Association Between Depression and Urinary Incontinence in Older Adults**

The Spearman correlation analysis revealed a very strong correlation (r = 0.753; p = 0.000), confirming that higher levels of depression are significantly associated with greater severity of urinary incontinence among older adults. This finding suggests a meaningful and strong association between the two variables in the Banjar Cepaka community.

This is consistent with a study by Lestari and Wulandari, which reported a significant association (p = 0.001) and an odds ratio (OR) of 7.42. This indicates that older adults with moderate to severe depression are seven times more likely to experience urinary incontinence than those without depression. The authors explained that depression may affect the central nervous system, disrupting bladder activity. Neurotransmitter imbalances associated with depression may interfere with urinary reflexes, increasing the risk of incontinence.[16]

Supporting evidence also comes from Agustina et al., who found a significant association between depression and urinary incontinence among older adults at the Budi Sejahtera Social Care Institution in Banjarbaru. Mechanisms proposed include weakened pelvic floor muscles, abnormal bladder contractions, diuretic use, and bladder inflammation. Depressed older adults may also experience increased urination frequency and cognitive impairments, such as reduced attention and concentration, making it harder to respond to bodily cues to urinate.[5]

Iwan et al. similarly found that lower depression levels were associated with lower risks of urinary incontinence. With a p-value of 0.000, their study confirmed that depression significantly affects urinary incontinence through mechanisms such as autonomic nervous system dysfunction and pelvic muscle weakness. Additionally, depression is linked to reduced physical activity and hygiene maintenance, worsening urinary incontinence symptoms.[8]

This study faced several limitations, including scheduling conflicts with local administrative staff and difficulties obtaining accurate information about residents' activities, which affected data collection timelines. Religious events in the community also caused delays, requiring adjustments to the research schedule. Methodologically, the use of purposive sampling introduces the risk of selection bias, and the cross-sectional design limits causal inference. While a strong association was found, this study cannot determine causality between depression and urinary incontinence. Longitudinal studies are needed to assess whether depression precedes urinary incontinence or vice versa. The small sample size and limited geographic scope also restrict the generalizability of the findings. Therefore, further research involving larger and more diverse populations is needed to enhance external validity.

## Conclusion

This study demonstrated a statistically significant, positive, and very strong correlation (r = 0.753; p < 0.05) between the level of depression and the incidence of urinary incontinence among older adults in Banjar Cepaka. These findings underscore the importance of promotive and preventive interventions, particularly in the early detection and management of depressive symptoms, to reduce the risk of urinary incontinence in the elderly population. Future studies are recommended to involve larger and more diverse samples and to consider additional factors such as quality of life, age, and physical activity.

## Author Contribution

Ni Luh Putu Dona Mahayanti conceptualized and designed the study. Ida Ayu Astiti Suadnyana contributed to methodology development and supervised the research process. I Gusti Ayu Sri Wahyuni Novanti was responsible for data collection and validation. I Putu Prisa Jaya performed statistical analysis and assisted in data interpretation. All authors contributed to drafting, revising, and final approval of the manuscript.

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## Conflict of Interest Statement

The authors declare that there are no conflicts of interest related to this study.

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## Ethics Statement

This study was conducted in accordance with the ethical principles of the Declaration of Helsinki. Ethical approval was obtained from the Research Ethics Committee of Universitas Bali Internasional, as evidenced by Ethical Clearance Letter No: 02.0461/UNBI/EC/II/2025. Written informed consent was obtained from all participants prior to their inclusion in the study.

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