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Health-related quality of life and psychological distress among the elderly with polypharmacy in elderly care homes of urban-Sri Lanka

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Title

Health-related quality of life and psychological distress among the elderly with polypharmacy in elderly care homes of urban-Sri Lanka.

Short Title

Quality of life and psychological profile of elderly with polypharmacy.

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Abstract

Background

Population ageing has led to a growing prevalence of multimorbidity and polypharmacy, especially among institutionalized older adults. Polypharmacy, commonly defined as the concurrent use of five or more medications, poses significant risks, including adverse drug reactions, poor adherence, cognitive decline, and reduced quality of life. Despite global evidence linking polypharmacy with diminished health-related quality of life (HRQOL) and heightened psychological distress, Sri Lanka lacks research examining this relationship within elderly care homes, a population uniquely vulnerable due to chronic illness, social isolation and dependence on caregivers. This study aims to assess health related quality of life and psychological distress among elderly residents with polypharmacy in selected elderly care homes in the Colombo District, Sri Lanka, exploring the relationships between polypharmacy and these outcomes, and associations of these outcomes with key sociodemographic factors.

Methods

A descriptive cross-sectional study was conducted among elderly residents (≥60 years) experiencing polypharmacy across 10 registered elderly care homes. A stratified random sample of 201 participants proportionately from each care home was selected. Data was collected through interviewer-administered questionnaires using validated tools: WHOQOL-BREF for health-related quality of life and Depression Anxiety Stress Scale–21 (DASS-21) for psychological distress. Medication data were extracted via a structured checklist. Non-parametric tests, including Chi-square and Spearman correlation, and multiple linear regression were used for analysis.

Results

Most participants (96.5%) reported moderate HRQOL, while 82.1% demonstrated at least mild depressive symptoms, and 64.7% reported anxiety symptoms. Polypharmacy showed a significant negative association with HRQOL ($\chi^2 = 7.24$, $p = 0.027$; $\rho = –0.449$, $p < 0.001$) and significantly predicted poor HRQOL ($\beta = –0.41$, $p < 0.001$). A strong positive association was observed between polypharmacy and psychological distress ($\chi^2 = 85.03$, $p < 0.001$; $\rho = 0.785$, $p < 0.001$), with regression showing polypharmacy predicting higher distress levels ($\beta = 0.78$, $p < 0.001$).

Conclusion

High polypharmacy is significantly associated with reduced HRQOL and heightened psychological distress among institutionalized elderly in the Colombo district, Sri Lanka. These findings underscore the need for routine medication reviews, deprescribing strategies and enhanced psychological support that are essential to improve the well-being in this medically and socially vulnerable population.

Keywords

Elderly with polypharmacy: Health-Related Quality of Life: Psychological Distress: Elderly Care Homes: Sri Lanka

Background

Global population ageing has risen over recent decades, leading to a pronounced prevalence of chronic non-communicable diseases among older adults [1]. As individuals age, the coexistence of multiple chronic conditions becomes increasingly common, often resulting in the need of long-term pharmacological management [2]. Consequently, polypharmacy which is commonly defined as the concurrent use of five or more medications, has emerged as a major public health concern in geriatric care [3,4].

While polypharmacy may be clinically appropriate in certain circumstances, it is frequently associated with adverse drug reactions, drug–drug interactions, medication non-adherence, increased risk of falls, cognitive impairment, hospitalizations and mortality [5,6]. Beyond these clinical consequences, polypharmacy has been also reported for its negative influence on patient-centered outcomes, particularly health-related quality of life (HRQOL) and psychological well-being [7]. The burden of complex medication regimens may interfere daily routine and significantly contribute to psychological stress, although the evidence for this relationship is underrepresented in literature specially regarding resource-limited settings [8].

HRQOL is a multidimensional concept encompassing individuals' subjective perceptions of their physical health, psychological state, level of independence, social relationships and interaction with their environment [9]. In older adults, HRQOL is influenced not only by disease burden but also by functional capacity and social support [10]. Thus, psychological distress, including anxiety and depression is pronounced in this demographic and may be intensified by polypharmacy and institutionalization [11].

Institutionalized elderly populations represent a particularly vulnerable group. Unlike community-dwelling older adults, residents of care homes often experience reduced autonomy, limited family interaction, social isolation and dependence on caregivers for daily activities and medication administration [12]. These factors may intensify the negative effects of polypharmacy on both HRQOL and psychological health [13]. Apart from this vulnerability, evidence on combined relationship between polypharmacy, HRQOL, psychological distress and selected sociodemographic characteristics among institutionalized elderly populations in low and middle-income countries remains underrepresented. This gap is particularly critical in Sri Lanka, in which the rates of population ageing are substantial compared to many countries in South Asia [14]. The demand for institutional care is rising, while challenging the country's traditional family-centric care model, particularly in the urban area of Colombo District [15,16]. Addressing this gap is essential for informing geriatric nursing practice, medication safety initiatives and policy development [17,18].

Under the light of this background, current study aimed to assess HRQOL and psychological distress among elderly residents with polypharmacy in selected elderly care homes in the Colombo District, Sri Lanka, and to examine the associations between polypharmacy, HRQOL, psychological distress and selected sociodemographic characteristics.

Methods

Study design and setting

A descriptive cross-sectional study design was employed to evaluate HRQOL, psychological distress and sociodemographic characteristics and their association with polypharmacy among elderly residents in institutional care settings. The study was conducted in ten selected registered elderly care homes

located in the Colombo District, Sri Lanka. These institutions provide long-term residential care for older adults with varying degrees of physical dependency, chronic illness and social support.

Study population

The study population consisted of elderly individuals aged 60 years and above who were permanent residents of the selected elderly care homes. Inclusion criteria comprised the ability to communicate effectively in Sinhala, Tamil or English, the provision of informed consent and has been institutionalized for more than a month. Elderly residents with severe cognitive impairment, clinically evident with acute psychiatric episodes impairing communication, any other acute medical illness or inability to participate in an interview were excluded.

Sample size calculation

A stratified random sampling technique was used to ensure proportional representation from each selected elderly care home [Table 1]. The sample size was calculated using Cochran's formula, assuming a 50% prevalence of polypharmacy (to yield the maximum sample size), a 95% confidence level, and a 5% margin of error [19]. A final sample of 201 participants was recruited.

Data collection procedure

Data was collected using an interviewer-administered structured questionnaire (supplementary file 1) and a medication checklist from September 01 to November 30, 2025. Prior to data collection, permission was obtained from relevant administrative authorities and elderly care home management. Written informed consent was obtained from all participants before the collection of data.

Interviews were conducted in a private and comfortable setting within each institution, approximately spending 30 minutes per each participant, using the participant's preferred language. Data collection

included sociodemographic information, clinical history, medication use, HRQOL and psychological distress. Medication information was verified by referring to institutional clinical records.

Measures

Health-related quality of life

HRQOL was assessed using the WHOQOL-BREF instrument, which has been validated for use in the Sri Lankan context [20,21]. The instrument evaluates four domains: physical health, psychological health, social relationships and environmental health. Domain scores were transformed according to standard guidelines, with higher scores indicating better perceived quality of life.

Psychological distress

Psychological distress was measured using the Depression Anxiety Stress Scale–21 (DASS-21) (Sri Lankan validated version), a screening tool widely used to assess symptoms of depression, anxiety, and stress [22]. Scores were categorized into normal, mild, moderate, severe and extremely severe levels based on established cut-off values.

Polypharmacy

Polypharmacy was defined as the concurrent use of five or more medications, including prescribed and over-the-counter drugs (assessed through participant interviews, caregiver confirmation and review of medication administration records) which has been administered for at least 1 month before the start of data collection [4]. Medication data included drug names, dosage, frequency, route of administration and duration of use. Polypharmacy was further categorized into low polypharmacy (5–9 medications) and high polypharmacy (≥10 medications) [23].

Sociodemographic characteristics

Sociodemographic variables included age and gender to explore its association with HRQOL and psychological distress.

Data analysis

Data analysis was conducted using Statistical Package for the Social Sciences (SPSS) version 27. Normality of continuous variables (DASS-21 subscales and WHOQOL-BREF domains) was assessed using the Shapiro–Wilk test, which indicated non-normal distribution ($p < 0.05$); therefore, nonparametric methods were used.

Polypharmacy was categorized into low (5–9 medications) and high (≥10 medications) based on commonly accepted thresholds in the literature, allowing meaningful comparison of medication burden among elderly residents.

Descriptive statistics (frequencies and percentages) were used to summarize sociodemographic, clinical, and polypharmacy characteristics. Inferential analyses were carried out using the Pearson Chi-Square test to assess associations between categorical variables.

Spearman's rank correlation was used to examine monotonic relationships between polypharmacy and continuous HRQOL and psychological distress scores ($p < 0.01$).

Multiple linear regression was performed to determine whether polypharmacy predicted HRQOL and psychological distress despite non-normality, as regression is robust to moderate deviations from normality. Regression outputs included coefficients, standard errors, betas, R^2, F-statistics, and *p*-values.

All tests were interpreted at a 95% confidence level, with $p < 0.05$ considered significant for chi-square and regression analyses.

Ethical consideration

This study was approved by the Ethics review Committee of the Faculty of Medicine, University of Colombo. (Approval no.EC-25-107, approved on August 21, 2025). Written informed consent was obtained from all participants before data collection.

Results

Participants characteristics

As detailed in Table 2, among 201 participants, the majority were males (60.2%, n = 121), while 39.8% (n = 80) was female. Participants were categorized into three age groups. Most belonged to the elderly age group (60–74 years) (63.2%, n = 127) and the mean age was 72 years. The majority of residents were Sinhalese (88.6%, n = 178), and had completed primary education (32.8%; n = 66) with less than 5 years (64.2%; n = 129) in the respective care home [Table 2].

Table 3 summarizes the clinical and polypharmacy characteristics of elderly who participated for the study. Accordingly, a majority of the participants (n = 176, 87.6%) reported having accessed a general practitioner (GP) within the last two months. Hospitalization within the preceding 12 months was reported by 150 participants (74.6%). With respect to the medication use, two- thirds (n= 133, 66.2%) of the participants of the sample experienced low polypharmacy (taking 5- 9 medications daily) while 33.8% (n = 68) was identified with high polypharmacy (≥10 medications daily). Among the participants, 138 (68.7%) residents complained on a chronic pain which exists longer than three months [Table 3].

HRQOL outcomes

Among the three HRQOL categories, moderate level of overall quality of life among majority of participants was detected as reflected by the mean total WHOQOL-BREF score of 47.89 ± 7.35. Analysis of specific domains revealed significant variability. The Environmental Health domain recorded the highest mean score (63.28 ± 14.64), whereas the Social Relationships domain reported the lowest [34.66 ± 13.06], reflecting reported limitations in personal relationships and social support. The Physical and Psychological health domains showed intermediate mean scores of 49.29 ± 14.05 and 52.05 ± 15.07, respectively [Table 4].

Psychological distress outcomes

Based on DASS-21 scores, in terms of depression, only 17.9% of the sample fell within the normal range, while the majority reported clinically relevant symptoms, with 6.5% showing mild, 31.8% moderate, 21.4% severe and 22.4% extremely severe depression. Anxiety followed a similar pattern, with 35.3% classified as normal, whereas 10.9%, 24.9%, 12.9% and 15.9% exhibited mild, moderate, severe and extremely severe anxiety respectively. Stress levels were comparatively lower, yet still concerning, with 54.7% of participants reporting normal stress, while 13.4% experienced mild, 14.4% moderate, 15.4% severe and 2.0% extremely severe stress [Table 5].

Associations with polypharmacy

Spearman's rank correlation revealed a moderate negative association between the number of medications prescribed and overall HRQOL (Spearman's $\rho = -0.449$, $p < 0.01$) [Table 6].

Conversely, a strong positive correlation was observed between polypharmacy and psychological distress (Spearman's $\rho = 0.785$, $p < 0.01$) [Table 7].

Predictors of HRQOL and Distress

In our regression analysis, polypharmacy emerged as a significant negative predictor of HRQOL, explaining 16.9% of the variance in quality-of-life scores ($\beta = -0.41$, $p < 0.05$). Furthermore, polypharmacy was a significant positive predictor of psychological distress. The regression model indicated that medication burden accounted for 61% of the variance in distress scores ($\beta = 0.78$, $p < 0.01$), suggesting a robust link between complex medication regimens and adverse mental health outcomes in this population [Table 8].

Sociodemographic Associations

Gender was not significantly associated with either HRQOL ($p = 0.677$) or psychological distress ($p = 0.674$). Similarly, no significant association was found between age and HRQOL scores. However, age showed a significant positive association with psychological distress ($p < 0.05$), indicating a higher mental health burden among the oldest old. Notably, participants aged 60–74 years appeared more resilient, with 44.1% classified in the low distress category compared to of those aged ≥ 75 years [Table 9].

Discussion

The present study provides a comprehensive evaluation of the relationship between polypharmacy, health-related quality of life (HRQOL), and psychological distress among elderly residents of selected elderly care homes in Colombo district. The findings indicate that polypharmacy is an important

231 determinant of wellbeing in this vulnerable population. In particular, the finding that polypharmacy
232 explained a substantial proportion of variance in psychological distress highlights an important
233 intersection between pharmacological management and mental health, which may often be overlooked
234 in routine geriatric care.

235 The prevalence of polypharmacy observed in the present study was notably high, reflecting the
236 substantial burden of chronic illness and multimorbidity among elderly care home residents. This
237 finding is consistent with previous research showing that polypharmacy is highly prevalent among
238 older adults, particularly those living in nursing homes or long-term care settings [24]. Older adults
239 with multimorbidity frequently require multiple long-term medications for disease control, symptom
240 relief, and prevention of complications, which increases the likelihood of polypharmacy [25]. In
241 institutional settings, medication burden may be further increased by routine continuation of long-term
242 prescriptions, fragmented prescribing by multiple providers, and inadequate periodic medication
243 review. Therefore, the high level of polypharmacy observed in this study is clinically plausible and
244 consistent with international evidence from institutionalized elderly populations.

245 The present study also found that polypharmacy was significantly associated with lower overall
246 HRQOL. This finding agrees with [26], which reported that medication-related factors, particularly the
247 use of a higher number of medicines, were associated with poorer HRQOL among older adults with
248 polypharmacy. Similarly, a previous study found that polypharmacy was associated with poorer
249 HRQOL trajectories among older adults, suggesting that medication burden may contribute to
250 progressive decline in perceived health and wellbeing [27]. Moreover, another study reported in
251 literature showed that patients with polypharmacy had poorer HRQOL, particularly in relation to the
252 physical component of quality of life [7]. Taken together, these studies support the present finding that

medication burden is not only a pharmacological concern but also a meaningful determinant of patient-reported wellbeing.

A particularly important finding of the present study was the pronounced negative impact of polypharmacy on the social health domain of the WHOQOL-BREF. This may be explained by the combined effects of medication burden, functional limitation, dependence on caregivers, and reduced autonomy within institutional settings. Previous studies have shown that institutionalization can negatively influence older adults' quality of life, especially through reduced social participation, separation from family, limited leisure activities, and social isolation [28]. In line with this the relationship between social interaction and quality of life among aged-care residents has been also emphasized in previous studies [29]. Therefore, the strong association between polypharmacy and poorer social HRQOL in the present study may reflect not only the biological effects of multiple medications but also the social consequences of dependence, reduced mobility, and limited participation in meaningful daily activities.

The association between polypharmacy and difficulties related to mobility, pain and discomfort, energy, sleep, and dependence on medical treatment is clinically plausible. The concurrent use of multiple medications increases the risk of adverse drug reactions, drug and drug interactions, drug and disease interactions, dizziness, fatigue, gastrointestinal symptoms, falls, and functional decline [23,30]. In institutionalized older adults, even mild medication-related adverse effects can reduce independence, limit engagement in daily activities, and increase reliance on caregivers. This dependence may further reduce perceived control over health and daily routines, thereby diminishing HRQOL.

In contrast, the physical, psychological, and environmental domains of HRQOL showed comparatively less pronounced, although still meaningful, associations with polypharmacy. One possible explanation is that the institutional care environment may partially buffer some environmental and physical

challenges through structured routines, caregiver assistance, and access to basic health services. However, such support may also obscure the individual impact of medication burden because residents' daily needs are often managed by staff. Previous studies have shown that the relationship between polypharmacy and HRQOL is not uniform across domains. For example, [7] found that polypharmacy was more strongly related to physical HRQOL than to mental HRQOL after adjusting for multimorbidity. This suggests that the effect of polypharmacy on quality of life may depend on the underlying health status, functional capacity, and social context of older adults.

Psychological distress was also prevalent among participants in the present study, with a considerable proportion reporting symptoms of depression, anxiety, and stress as measured by the DASS-21. Importantly, polypharmacy was significantly associated with higher psychological distress. This finding is consistent with [31], which found that polypharmacy was associated with depressive symptoms among older adults, although their study did not find a significant association with anxiety after adjustment. The present findings also extend previous evidence by showing that medication burden may be related not only to depressive symptoms but also to broader psychological distress in institutionalized elderly residents. However, the evidence is not entirely consistent. The association between polypharmacy and psychological distress was no longer significant after accounting for multimorbidity, suggesting that the observed relationship may be partly explained by the burden of chronic disease itself [7]. Therefore, in the present study, polypharmacy may act both as a direct stressor and as an indicator of underlying disease severity.

Several mechanisms may explain the association between polypharmacy and psychological distress. Older adults who take multiple medications may experience fear of adverse effects, frustration with complex medication schedules, sleep disturbances, and a heightened perception of illness severity. In care home settings, residents may also have limited control over medication administration, which can

reduce autonomy and contribute to emotional vulnerability. Furthermore, adverse medication effects such as fatigue, dizziness, sleep problems, or cognitive changes may indirectly contribute to depressive or anxiety-related symptoms. These mechanisms suggest that medication burden should be considered when assessing mental health among elderly care home residents.

Sociodemographic characteristics also played a role in the outcomes of the present study. Increasing age was associated with higher psychological distress, although it was not significantly associated with HRQOL. This finding may be understood in relation to age-related functional decline, greater dependence, bereavement, social isolation and reduced perceived control among older institutionalized adults [32]. Previous studies have shown that social support is an important protective factor against psychological distress in later life [33], while institutionalization and loneliness are closely related to poorer wellbeing among older adults [28]. Therefore, the observed association between advanced age and psychological distress may reflect the combined effects of frailty, reduced independence, and social vulnerability rather than chronological age alone.

The present study found no significant association between gender and either HRQOL or psychological distress. This finding suggests that, within elderly care home settings, medication burden, health status, functional dependence, and psychosocial factors may be more influential than gender in determining wellbeing. This interpretation aligns with the finding that sociodemographic variables like age and gender were less strongly associated with quality of life compared to emotional distress, psychological well-being and other health-related factors among older adults [34]. However, previous literature on gender differences in psychological distress among older adults remains mixed, and some studies have reported higher distress among women [33]. Therefore, the absence of gender differences in the present study may reflect the shared institutional environment and similar health burdens experienced by both male and female residents.

Overall, the findings of this study emphasize that polypharmacy is not merely a clinical or pharmacological issue but a significant determinant of physical, social, and psychological wellbeing among institutionalized elderly populations. The use of the WHOQOL-BREF and DASS-21 provided a multidimensional understanding of patient-reported outcomes, allowing the study to capture both quality of life and psychological distress [35]. These findings highlight the importance of incorporating regular HRQOL and mental health assessments into geriatric care.

The results also underscore the need for multidisciplinary medication review, identification of potentially inappropriate medications, and individualized deprescribing strategies. Evidence from long-term care settings suggests that structured deprescribing interventions can reduce inappropriate medication use among older residents [36]. Therefore, collaboration among physicians, nurses, pharmacists, psychologists, and caregivers is essential to optimize medication regimens while also addressing mental health and social wellbeing. Targeted interventions focusing on medication optimization, psychological screening, social engagement, and resident autonomy may substantially improve quality of life among elderly care home residents.

Limitations and strengths

This study has several limitations that should be considered when interpreting the findings. First, the cross-sectional design limits the ability to establish causal relationships between polypharmacy, HRQOL and psychological distress. Since data were collected using interviewer-administered questionnaire, which may introduce interviewer bias or social desirability bias, particularly among older adults. Third, information on disease duration and disease severity was not available, although these factors may influence both medication burden and quality of life. Finally, the study was conducted

in selected elderly care homes within the Colombo District, which may limit the generalizability of the findings to elderly populations in other regions or care settings.

Despite these limitations, the study has several important strengths. To our knowledge, this is one of the few studies in Sri Lanka to examine the combined impact of polypharmacy on HRQOL and psychological distress among institutionalized elderly individuals. The use of internationally validated instruments; WHOQOL-BREF and DASS-21, enhances the reliability, validity and comparability of the findings. The study assessed multiple domains of quality of life and psychological distress rather than focusing solely on physical outcomes, providing a holistic perspective on elderly well-being. Additionally, the inclusion of relevant sociodemographic variables allowed for a more nuanced understanding of factors influencing HRQOL and psychological distress. The findings contribute valuable local evidence to an under-researched area with direct implications for geriatric nursing practice, medication safety initiatives, and policy development in Sri Lanka.

Conclusion

In line with existing evidence, this study demonstrates that polypharmacy is highly prevalent among elderly residents of care homes in the Colombo District, Sri Lanka, and is significantly associated with poorer health-related quality of life and increased psychological distress. The negative impact of polypharmacy was most pronounced in the social relationships' domain of HRQOL, while its association with psychological distress highlights the broader emotional and psychosocial consequences of complex medication regimens. These findings are particularly important for elderly individuals with multiple chronic conditions and prolonged institutionalization, who are at heightened risk of polypharmacy and diminished well-being. Regular medication review, deprescribing where

appropriate and the integration of mental health assessment and support into routine geriatric care are essential to improve the overall quality of life of this vulnerable population.

Declarations

Abbreviations

DAAS-21 - Depression Anxiety Stress Scale–21

HRQOL - Health-related quality of life

QOL – Quality of Life

SD – standard deviation

SPSS - Statistical package for the social sciences

WHOQOL – Word health organization quality of life

Ethics approval and consent to participate

The study procedure was approved by the Ethics review Committee (ERC) of the Faculty of Medicine, University of Colombo. (Approval no.EC-25-107, approved on August 21, 2025). All procedures performed in this study involving human participants were conducted in accordance with the ethical standards of the ERC of the faculty of Medicine, University of Colombo and with the Declaration of Helsinki (1964) and its later amendments and comparable ethical standards. Written informed consent was obtained from all participants before data collection.

Consent for publication

Not applicable

Availability of data and materials

The datasets used and analyzed during the current study are available from the corresponding author upon reasonable request.

Competing interests

The authors declare that they have no competing interests.

Clinical trial number

Not Applicable

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Authors' contributions

G Y C Wickramanayake: Supervision, Methodology, Writing- Original draft **T M Arachchi:** Methodology, Validation, Formal analysis **M D Ruwanpathirana:** Investigation: **D S Jayawickrama:** Investigation **W G D Dishara:** Investigation **P L P A Madhushyani:** Investigation **H K C L Perera:** Investigation **G G N Sihara:** Investigation **U I Amarasiriwardhana:** Investigation **D A S Elvitigala:** Conceptualization, Supervision, Writing- Reviewing and Editing

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References

1. World Health Organization. Ageing and health. 2022 Oct 1 [cited 2024 May 22]. Available from: https://www.who.int/news-room/fact-sheets/detail/ageing-and-health
2. United Nations Department of Economic and Social Affairs, Population Division. World Population Ageing 2020 Highlights: Living arrangements of older persons. New York: United Nations; 2020. Research Report No.: ST/ESA/SER.A/451. Available from: un.org.
3. Halli-Tierney AD, Scarbrough C, Carroll D. Polypharmacy: Evaluating risks and deprescribing. Am Fam Physician. 2019;100(1):32–38.
4. Masnoon N, Shakib S, Kalisch-Ellett L, Shore GE. What is polypharmacy? A systematic review of definitions. BMC Geriatr. 2017; doi:10.1186/s12877-017-0621-2
5. Maher RL, Hanlon J, Hajjar ER. Clinical consequences of polypharmacy in elderly. Expert Opin Drug Saf. 2014; doi:10.1517/14740338.2013.827660.
6. Gnjidic D, Hilmer SN, Blyth FM, Naganathan V, Waite L, Seibel MJ, et al. Polypharmacy cutoff and outcomes: five or more medicines were used to identify community-dwelling older men at risk of different adverse outcomes. J Clin Epidemiol. 2012; doi: 10.1016/j.jclinepi.2012.02.018
7. Wilder LV, Devleesschauwer B, Clays E, Pype P, Vandepitte S, De Smedt D. Polypharmacy and health-related quality of life/psychological distress among patients with chronic disease. prev chronic dis 2022; doi: http://dx.doi.org/10.5888/pcd19.220062.

8. Albarqouni L, Palagama S, Chai J, Sivananthajothy P, Pathirana T, Bakhit M, et al. Overdiagnosis and Overuse of Healthcare Services in LMICs Network. Overuse of medications in low- and middle-income countries: a scoping review. Bull World Health Organ. 2023; doi: 10.2471/BLT.22.288293.
9. The WHOQOL Group. The World Health Organization Quality of Life assessment (WHOQOL): Position paper from the World Health Organization. Soc Sci Med. 1995; doi:10.1016/0277-9536(95)00112-K.
10. Mandal K, Rai A, & Kar N. Factors Affecting Quality of Life of an Elderly Person: a systematic review and meta analysis. *MJN*, 2026; doi:10.31674/mjn.2024.v16i02.024.
11. Drageset J, Eide GE, Nygaard HA, Bondevik M, Nortvedt MW, Natvig GK. The impact of social support and sense of coherence on health-related quality of life among nursing home residents: A questionnaire survey in Bergen, Norway. Int J Nurs Stud. 2009; doi:10.1016/j.ijnurstu.2008.07.005.
12. Lapane KL, Lim E, McPhillips E, Barooah A, Yuan Y, Dube CE. Health effects of loneliness and social isolation in older adults living in congregate long term care settings: A systematic review of quantitative and qualitative evidence. Arch Gerontol Geriatr; doi:10.1016/j.archger.2022.104728.
13. Jerjes W, Harding D. Confronting polypharmacy and social isolation in elderly care: a general practitioner's perspective on holistic primary care. Front Aging. 2024; doi:10.3389/fragi.2024.1384835.
14. World Bank. World Bank Open Data: Population ages 65 and above (% of total population) - Sri Lanka, South Asia. 2024 [cited 2026 Feb 27]. Available from: https://data.worldbank.org/indicator/SP.POP.65UP.TO.ZS?locations=LK-8S.

15. Abeysinghe AADSN. Exploring occupational challenges of caregivers in elderly care facilities in Sri Lanka: A qualitative study in Colombo District. In: Proceedings of the International Research Conference of the Open University of Sri Lanka (IRC-OUSL 2025). 2025. p. 1–6. Available from: http://repository.ou.ac.lk/handle/94ousl/3711
16. Asian Development Bank. Country Diagnostic Study on Long-Term Care in Sri Lanka. 2021 [cited 2026 Feb 27]. Available from: https://www.adb.org/publications/sri-lanka-diagnostic-study-long-term-care.
17. Ministry of Health Sri Lanka. National Action Plan on Medication Safety for Sri Lanka. Colombo: Directorate of Healthcare Quality and Safety; 2021 [updated 2025]. Available from:https://quality.health.gov.lk/images/2021/Medication_safety_book_13-09-2021_complete.pdf
18. Parliament of Sri Lanka. National Policy for Senior Citizens (2025–2035) to be launched on October 1st. 2025 Sep 25 [cited 2026 Feb 27]. Available from: https://www.parliament.lk/en/home/parliament-news/view/4823
19. Ahmed SK. How to choose a sampling technique and determine sample size for research: A simplified guide for researchers. Oral Oncol Rep. 2024; doi:10.1016/j.oor.2024.100662.
20. Kumarapeli V, Seneviratne RA, Wijeyaratne CN. Validation of WHOQOL-BREF to measure quality of life among women with polycystic ovary syndrome. J Coll Community Physicians Sri Lanka. 2006;11(2):1–10.
21. Ratnayake RMPS, Agampodi TC, Siribaddana S, Agampodi SB. Validation of the Sinhala version of the World Health Organization Quality of Life–Disability (WHOQOL-DIS) module for assessing quality of life in maxillofacial injury patients in Sri Lanka. Discov Public Health. 2025; doi:10.1186/s12982-025-00967-y.

22. Aththidiye AVSR, Ismail C. Adaptation and Validation of the Depression Anxiety and Stress Scale 21 (DASS-21) among students in the University of Colombo. In: Annual Research Symposium 2012; 2012 Aug 18; Colombo, Sri Lanka. Faculty of Graduate Studies, University of Colombo.
23. Pazan F, Wehling M. Polypharmacy in older adults: A narrative review of definitions, epidemiology and consequences. Eur Geriatr Med. 2021;12(3):443–452. doi:10.1007/s41999-021-00479-3.
24. Cadenas R, Diez MJ, Fernández N, García JJ, Sahagún AM, Sierra M, et al. Prevalence and associated factors of polypharmacy in nursing home residents: A cross-sectional study. Int J Environ Res Public Health. 2021; doi:10.3390/ijerph18042037.
25. Aggarwal P, Woolford SJ, Patel HP. Multi-morbidity and polypharmacy in older people: Challenges and opportunities for clinical practice. Geriatrics. 2020; doi:10.3390/geriatrics5040085.
26. Montiel-Luque A, Núñez-Montenegro AJ, Martín-Aurioles E, Canca-Sánchez JC, Toro-Toro MC, González-Correa JA, et al. Medication-related factors associated with health-related quality of life in patients older than 65 years with polypharmacy. PLoS One. 2017; doi:10.1371/journal.pone.0171320.
27. Aljeaidi MS, Haaksma ML, Tan ECK. Polypharmacy and trajectories of health-related quality of life in older adults: An Australian cohort study. Qual Life Res. 2022; doi:10.1007/s11136-022-03136-9.
28. de Medeiros MMD, Carletti TM, Magno MB, Maia LC, Cavalcanti YW, Rodrigues-Garcia RCM. Does the institutionalization influence elderly's quality of life? A systematic review and meta-analysis. BMC Geriatr. 2020; doi:10.1186/s12877-020-1452-0.

29. Siette J, Dodds L, Surian D, Prgomet M, Dunn A, Westbrook J. Social interactions and quality of life of residents in aged care facilities: A multi-methods study. PLoS One. 2022; doi:10.1371/journal.pone.0273412.
30. Roitto HM, Aalto UL, Öhman H, Saarela RKT, Kautiainen H, Salminen K, Pitkälä KH. Association of medication use with falls and mortality among long-term care residents: A longitudinal cohort study. BMC Geriatr. 2023; doi:10.1186/s12877-023-04096-6
31. Cheng C, Bai J. Association between polypharmacy, anxiety, and depression among Chinese older adults: Evidence from the Chinese Longitudinal Healthy Longevity Survey. Clin Interv Aging. 2022;17:235–244. doi:10.2147/CIA.S351731
32. Jalali A, Ziapour A, Karimi Z, Rezaei M, Emami B, Pourmirza Kalhori R, et al. Global prevalence of depression, anxiety, and stress in the elderly population: a systematic review and meta-analysis. BMC Geriatr. 2024;. doi:10.1186/s12877-024-05311-8
33. Bøen H, Dalgard OS, Bjertness E. The importance of social support in the associations between psychological distress and somatic health problems and socio-economic factors among older adults living at home: A cross-sectional study. BMC Geriatr. 2012; doi:10.1186/1471-2318-12-27.
34. Lopez J, Perez-Rojo G, Noriega C, Sánchez-Cabaco A, Sitges E, Bonete B. Quality-of-life in older adults: Its association with emotional distress and psychological wellbeing. BMC Geriatr. 2024; doi:10.1186/s12877-024-05401-7
35. Skevington SM, Lotfy M, O'Connell KA, WHOQOL Group. The World Health Organization's WHOQOL-BREF quality of life assessment: Psychometric properties and results of the international field trial: A report from the WHOQOL Group. Qual Life Res. 2004; doi:10.1023/B.0000018486.91360.00

36. McDonald EG, Estey JL, Davenport C, Bortolussi-Courval É, Gaudet J, Registe PPW, Lee TC, Goodine C, et al. Electronic decision support for deprescribing in older adults living in long-term care: A stepped-wedge cluster randomized trial. JAMA Netw Open. 2025; doi:10.1001/jamanetworkopen.2025.12931

Tables

Table 1: Proportion of residents recruited from selected elderly care homes for study

No.	Name of the Elder Home	Nh	nh
01	Gamage Athar Perera	18	9
02	Moratuwa Janadara	87	42
03	Salina Alwis Gunarathna	34	16
04	Mallika	54	26
05	Happy Hearts	11	5
06	Soma Rajapaksha	11	5
07	The Salvation Army Elders Home for Men and Irish Perera Home for Women	35	17
08	Sahana Udaya Elders Retreat Home	33	16
09	City Home for the Elders	79	38
10	Shanthi Nivasa	58	27
	Total	N = 420	n= 201

Table 2: Socio-demographic characteristics of the elderly residing in elderly care homes of Colombo District (N=201)

Variable		Frequency (n)	Percent (%)
Gender	Male	121	60.2
	Female	80	39.8
Age Classification	Elderly (60–74 years)	127	63.2
	Senile (75–89 years)	71	35.3
	Long-livers (≥90 years)	3	1.5
Ethnicity	Sinhalese	178	88.6
	Sri Lankan Muslim	3	1.5
	Sri Lankan Tamil	7	3.5
	Indian Tamil	1	0.5
	Burgher	10	5.0
	Other	2	1.0

Education Level	No Schooling	24	11.9
	Primary (1–5)	66	32.8
	Secondary (6–9)	55	27.4
	Ordinary Level (10–11)	36	17.9
	Advanced Level (12–13)	19	9.5
	Other	1	0.5
Length of Institutionalization	< 5 years	129	64.2
	5–10 years	43	21.4
	10–15 years	19	9.5
	> 15 years	10	5.0

Table 3: Clinical and polypharmacy characteristics of study participants (N=201)

Variable		*Frequency (n)*	*Percent (%)*
Contact with GP in the past 2 months	Yes	176	87.6
	No	25	12.4

Hospitalization in the past 12 months	Yes	150	74.6
	No	51	25.4
Polypharmacy Category	Low polypharmacy	133	66.2
	High polypharmacy	68	33.8
Suffering with pain for a period more than 3 months	Yes	138	68.7
	No	63	31.3

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537 Table 4: Distribution of mean QOL scores in each WHOQOL-BREF domain and HRQOL among
538 Elderly with Polypharmacy (N = 201)

Domain	**Mean ±Standard Deviation (SD)**
Physical health	49.29 ± 14.05
Psychological health	52.05 ± 15.07
Social relationships	34.66 ± 13.06
Environmental domain	63.28 ± 14.64
Overall Quality of Life score	47.89 ± 7.35

QoL Category	**Frequency (n)**	**Percent (%)**
Low Quality of Life	6	3.0
Moderate Quality of Life	194	96.5
High Quality of Life	1	0.5

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540 Table 5: Distribution of participants based on domains of DASS-21 severity levels (N=201)

Domain		**Frequency (n)**	**Percent (%)**
Depression	Normal	36	17.9
	Mild	13	6.5
	Moderate	64	31.8
	Severe	43	21.4
	Extremely Severe	45	22.4
Anxiety	Normal	71	35.3
	Mild	22	10.9
	Moderate	50	24.9
	Severe	26	12.9
	Extremely Severe	32	15.9

Stress	Normal	110	54.7
	Mild	27	13.4
	Moderate	29	14.4
	Severe	31	15.4
	Extremely Severe	4	2.0

Table 6: Spearman Correlation between Polypharmacy Category and HRQOL (N= 201)

Variable 1	*Variable 2*	*Spearman's ρ*	*p-value*
Polypharmacy	Health related quality of life	-0.449	< 0.001*

*- Spearman's Rho correlation value. Correlation is significant at the 0.01 level (2-tailed).

Table 7: Spearman Correlation between Polypharmacy and Psychological Distress (N=201)

Variable 1	*Variable 2*	*Spearman's ρ*	*p-value*
Polypharmacy	Psychological distress	0.785	< 0.001*

*- Spearman's Rho correlation value. Correlation is significant at the 0.01 level (2-tailed)

Table 8: Multiple Linear Regression Analysis for Polypharmacy Predicting HRQOL (N = 201)

Variable	**B**	**SE B**	**β**	**t**	**p**	**R^2**	**F**
Constant	56.42	1.42	-	39.69	<0.001	0.169	40.54
Polypharmacy	- 6.38	1.00	-0.41	-6.37	<0.001		

Table 9: Pearson chi square analysis of Age and Gender with Psychological Distress(N=201)

Factors	**Low Psychological distress n (%)**	**Moderate Psychological Distress n (%)**	**High Psychological Distress n (%)**	**P value**
Age				0.001*
Elderly (60-74 years)	56 (44.1%)	64 (50.4%)	7 (5.5%)	
Senile (75-89 years)	27 (38.0%)	39 (54.9%)	5 (7.0%)	
Long Livers (≥90 years)	0 (0.0%)	1 (33.3%)	2 (66.7%)	
Gender				0.674*
Male	53 (43.8%)	60 (49.6%)	8 (6.6%)	
Female	30 (37.5%)	44 (55.0%)	6 (7.5%)	

***-** Pearson chi square value (*p< 0.05)*

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