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RESEARCH NOTES

THE INFLUENCE OF SOCIAL AND INDIVIDUAL FACTORS ON MEDICINE USE IN OLDER ADULTS

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ABSTRACT

OBJECTIVE:

To quantitatively explore the social and individual factors (including beliefs, experiences, and health literacy) that may affect medicine use in older adults.

DESIGN:

A descriptive research approach with quantitative-based methods was used. Individual structured interviews were completed for each participant where they were questioned on any health conditions, medicines, and healthcare utilisation. The following validated questionnaires were implemented in the interview; Beliefs about Medicines Questionnaire, Health Literacy Questionnaire, EQ-5D-5L scale, Barthel Activities of Daily Living Index, Perceived Sensitivity to Medicines Scale, Patients Attitudes Towards Deprescribing, Medication Related Burden Quality of Life, and Adherence to Refills and Medication Scale. Descriptive statistics were calculated using SPSS software.

SETTING:

People ≥65 years living in the community in Australia.

MAIN OUTCOME MEASURES:

Suboptimal prescribing, including polypharmacy, potentially inappropriate medicines use, and adherence.

RESULTS:

Twenty-four participants completed the study and reported a mean BMQ necessity score of 11/25, mean specific concerns score of 19/25, mean general overuse score of 12/20 and suggest general harm score of 16/20. Most participants believed that medicines do more harm than good and physicians are overprescribing medicines. The highest scoring HLQ domain was 'Navigating the healthcare system', while the lowest scoring domains were 'social support' and 'having sufficient information to manage my health'. Additionally, individual experience was found to be an important factor in participants' medication attitudes and participants who trusted their prescriber were more likely to adhere to their medication regimen.

CONCLUSION:

The influence of beliefs, experiences, and health literacy on medicine use in older adults remains unclear, and future studies will investigate the effects of these factors on a larger sample size.

KEYWORDS
beliefs; experiences; health literacy; older adults; polypharmacy; potentially inappropriate medicines

INTRODUCTION

Older adults with multiple chronic conditions are at risk of harm from suboptimal prescribing. Suboptimal prescribing is prescribing medicines in a way that is less than optimal and therapeutically inappropriate. It is an umbrella term that includes polypharmacy, underprescribing and the use of potentially inappropriate medicines (PIMs). 275,000 medicine-related hospital admissions annually cost the Australian government an estimated $1.4 billion (AUD) [1]. Suboptimal prescribing of medicines has been associated with poorer clinical outcomes [2].

Socioeconomic disadvantage, beliefs, and health literacy can contribute to nonadherence or suboptimal prescribing. In 2006, approximately 43% of Australians aged between 60 and 74 had health literacy skills considered 'less than adequate' [4], putting them at greater risk of poor health outcomes. The medical experience is both social and personal, and negative experiences can arise from adverse drug events, medicine-related burdens, and dissatisfaction with the healthcare system [3-5]. People bring and develop their own experiences, beliefs and understanding of their medicines, influencing their views of healthcare and medicine utilisation.

Although studies have highlighted the significance of beliefs, experiences, and health literacy on medication use, current findings among older adults are conflicting and limited. When utilizing the Beliefs about Medicines Questionnaire (BMQ), it was observed that patients with higher necessity scores demonstrated higher adherence, whereas higher concerns were associated with lower adherence [5, 6]. Furthermore, beliefs were identified as the most influential predictor of adherence, surpassing sociodemographic factors [6]. However, while certain literature suggests that younger patients exhibit lower levels of adherence compared to their older counterparts [6] [7], recent studies have found contradictory results [8]. Beliefs can also be influenced by individuals' experiences. Current literature emphasizes the significance of the patient-prescriber relationship and its impact on medication use. Previous findings indicate that better, higher-quality experiences with healthcare providers are associated with improved adherence [4, 9, 10]. It is important to note that although literature exists on this topic, participants are typically 18 years or older [4, 9, 10]. Similarly, while evidence suggests that adequate health literacy is linked to higher adherence among older adults [11, 12], the proportion of participants aged 65 years or older is not consistently reported, making it difficult to generalize these findings to this population [11-13]. Additionally, contradictory findings indicate that health literacy levels may not be associated with self-reported or objectively measured adherence [13]. Considering the aforementioned observations, contemporary literature has not yet fully integrated these factors and examined their influence on medication use among older adults. The existing research focuses primarily on adherence as the primary outcome, with limited attention to exploring how social and individual factors may impact other aspects of inappropriate medication use (polypharmacy and potentially inappropriate medications).

Understanding and identifying the underlying reasons for potentially suboptimal prescribing is important in reducing the risk of medicine-related harm. While some findings were consistent with one another, other studies reflected otherwise. Current research does not address how a range of social factors can potentially influence medicine use in older adults. Therefore, this exploratory study aimed to quantitatively explore the social and individual factors (including beliefs, experiences, and health literacy) that may affect medicine use in older adults aged 65 years and older.

RESEARCH QUESTION

Do beliefs, experiences and health literacy influence medicine use in Older Adults?

MATERIALS AND METHODS

STUDY DESIGN AND SETTING

This cross-sectional exploratory study was conducted between May and October 2020 in Australia, and participants were recruited via convenience sampling. All participants were asked to provide verbal or written consent prior to their interview. Descriptive research with quantitative based methods was the approach used for this study.

ELIGIBILITY CRITERIA AND RECRUITMENT

Participants aged 65 years or above with the capacity to provide informed consent were eligible to participate. Participants were recruited via brochures distributed through community pharmacies and general practices, word-of-mouth, and advertisements in public locations.

DATA COLLECTION

Individual structured interviews were completed for each participant. Interviews were conducted face-to-face or online via virtual platforms, including Zoom and Microsoft Teams. Prior to interviews, all researchers involved in conducting the interview received centralised training on the interviewing process.

During the interview, sections 1-5 queried participants on existing health conditions, medicines, their indicated use, and utilisation of healthcare systems such as community pharmacies and hospitals (refer to Appendix a). Sections 6-13 incorporated use of validated questionnaires.

1. The interview consisted of thirteen sections:
2. Participant details and demographics
3. Self-reported Health Conditions
4. Medication Management
5. Adverse Drug Reactions or Drug Allergies
6. Healthcare Utilisation
7. EQ-5D-5L slides and 5-item Questionnaire [14]
8. 10-item Barthel Activities of Daily Living index [15]
9. The Perceived Sensitivity to Medicines Scale (PSM) [16]
10. Beliefs about Medicines Questionnaire (BMQ) [17].
11. Health Literacy Questionnaire (HLQ) [18]
12. Medication Related Burden Quality of Life scale (MRB-QoL) [19]
13. Patients Attitudes Towards Deprescribing scale (PATD) [20].
14. Adherence to Refills and Medication Scale (ARMS) [21]

To ensure comprehensive coverage of beliefs, experiences, health literacy, and adherence during the interviews, utilization of multiple validated questionnaires was necessary. To address participants' beliefs and attitudes, the BMQ and PATD were employed. To capture experiences, PSM and MRB-QoL questionnaires were utilized. Health literacy was assessed using the HLQ, and adherence evaluated using the ARMS. Additionally, to gauge participants' quality of life and their ability to perform daily activities, the EQ-5D-5L slider and questionnaire were incorporated, along with the Barthel Activities of Daily Living index. The selection of these validated questionnaires was based on their established credibility, internal consistency, and wide usage in existing literature. All chosen tools exhibited a Cronbach alpha internal consistency score exceeding 0.6, further supporting their reliability. In addition, each validated tool was used in its entirety, no questions were omitted or excluded.

Data collected through each individual interview was stored using REDCap software and then exported to SPSS to obtain descriptive statistics for analysis.

DEFINITIONS

Prescribing in older adults was measured by the prevalence of polypharmacy, PIMs, and underprescribing. Polypharmacy and hyperpolypharmacy were defined as the use of five or more; and ten or more medicines, respectively [2]. PIMs were assessed using the Beers 2015 and the Screening Tool of Older Person" Prescriptions (STOPP) criteria [22, 23]. Section E (Renal Systems criteria) of the STOPP criteria was excluded as participant renal function was unknown. Underprescribing was measured using the Screening Tool to Alert Doctors to Right Treatment criteria [23].

DATA ANALYSIS

Descriptive statistics such as means, standard deviations and percentages were calculated using the Statistical Package for Social Sciences (SPSS) software version 16.0. An excel spreadsheet was also used to summarise the data. Descriptive statistics were calculated for both demographic data, as well as data obtained from each validated questionnaire. Due to the small sample size, no further statistical analysis could be completed.

ETHICS

Ethics was approved by the Monash University Human Research Ethics Committee (#21902) and registered at the RMIT University College Human Ethics Advisory Network (#25397).

RESULTS

DEMOGRAPHICS

A total of 24 participants (n=12, 50% male) aged between 65 and 88 years of age (M=73, SD=6.6) (Table 1) from Melbourne, Brisbane and Cairns. The most common self-reported conditions were arthritis and rheumatism. Most participants (n=17, 71%) reported using only one pharmacy. Half (n=14, 58%) the participants did not self-report any difficulties opening medicines packaging. Of the participants (n=10, 42%) who reported difficulty when opening their medicines (agreed or strongly agreed), most (n=7, 70%) were also diagnosed with arthritis.

TABLE 1. DEMOGRAPHICS, HEALTH CONDITIONS AND HEALTHCARE UTILISATION OF RECRUITED PARTICIPANTS (N=24)

	Mean ± SD
Age (years)	73 ± 6.6
Sex, n (%)	
Male	12 (50)
Female	12 (50)
Country of Birth, n (%)	
Australia	16 (67)
Overseas	8 (33)
Education, n (%)	
Primary school or equivalent	1 (4)
Secondary school or equivalent	8 (33)
Tertiary level or equivalent	15 (63)
Blood Pressure*	
Systolic	127.1 ± 16.3
Diastolic	80.1 ± 4.5
Height **	169.6 ± 6.7
Weight ***	76.3 ± 12.6
Self-reported conditions, n (%)	
Arthritis/Rheumatism	13 (54)
Pain/Discomfort	10 (42)
Back pain	10 (42)
Dexterity issues	10 (42)

Allergy	9 (38)
Mobility issues	6 (25)
Hypertension	6 (25)
Heart Disease	4 (17)
Diabetes	4 (17)
Thyroid Condition	3 (13)
Other****	23 (96)
Eyesight, n (%)	
Normal	5 (21)
Poor eyesight (no glasses)	1 (4)
Uses glasses	16 (67)
Not mentioned	2 (8)
Hearing, n (%)	
Normal	15 (63)
Poor hearing (no hearing aid)	3 (13)
Uses hearing aid	2 (8)
Not mentioned	4 (17)
Falls, n (%)	10 (42)
Fractures, n (%)	12 (50)
Healthcare Utilisation and Medicine Use	
Number of General Practitioners	1 ± 0.5
Number of Specialists	1 ± 1.4
Hospitalisation (annual)	0.5 ± 0.9
Single pharmacy use, n (%)	17 (71)
Multiple pharmacy use, n (%)	7 (29)
Adverse drug event, n (%)	14 (58)
Number of medicines*****	4 ± 2.9
Polypharmacy, n (%)	4 (25)
Hyperpolypharmacy, n (%)	1 (6)
Participants prescribed a PIM, n (%)	1 (6)
Underprescribing, n (%)	2 (13)
Dose administration aids, n (%)	7 (29)

* n = 10, 10 participants did not have their blood pressure measured.

** n = 20, four participants could not report their height.

*** n=22, 2 participants could not report their weight.

****Conditions reported by two or fewer participants

***** n = 16, eight participants could not report their medicines

SUBOPTIMAL PRESCRIBING

Two-thirds of the participants (n=16, 67%) could report their medicines. A current medicines list could not be obtained for the other eight participants. Of the 16 participants for whom a medicines list was obtained, the mean number of medicines used was four (SD=2.9) medicines. Polypharmacy and hyperpolypharmacy were observed in five participants (polypharmacy n=4, 25% and hyperpolypharmacy n=1, 6%). Of participants using polypharmacy or hyperpolypharmacy (n=5), low necessity (M=11.8, SD=6.1) and high concern (M=19.6, SD=4.2) scores with high to moderate adherence scores (M=13.4, SD=1.7) were found.

Of all 24 participants, two were recognised to be using an individual PIM. Under prescribing was identified in two participants with known osteoporosis. Participants recorded a mean medicine adherence ARMS score of 12.7 (SD=1.8) ranging from 9 to 16 (Table 2). Most participants (n=18, 75%) reported always taking their regular medicine regardless of how they felt. About half the participants (n=13, 54%) stated they sometimes forgot to take their medicines.

TABLE 2. MEAN SCORES RECORDED BY PARTICIPANTS PER EACH VALIDATED TOOL.

Validated Questionnaire	Mean ± SD
EQ 5D 5L slide (/100) *	79.9 ± 12.4
EQ 5 item questionnaire (/1) **	0.7 ± 0.3
Barthel Activities of Daily Living Index (/100)*	92.7 ± 6.3
Beliefs about Medicines Questionnaire (BMQ)	
Specific Necessity (/25)	11.1 ± 3.8
Specific Concerns (/25)	18.8 ± 3.3
General Overuse (/20)	12.2 ± 3.7
General Harm (/20)	15.7 ± 2.4
Perceived sensitivity to medicines (/25) **	12.6 ± 4.6
Adherence to Refills and Medication Scale (ARMS) ***	12.7 ± 1.8
Medication Related Burden Quality of Life scale (MRB-QoL)	
Routine & Regimen complexity (/55)	42.3 ± 14.2
Psychological burden (/30)	19.3 ± 8.8
Functional & Role Limitation (/35)	24.6 ± 9.4
Therapeutic relationship (/15)	12.4 ± 3.0
Social Burden (/20)	16.3 ± 5.4
Health Literacy Questionnaire (HLQ)	
Feeling understood & supported by healthcare providers (/20)*	18.0 ± 2.3
Having sufficient information to manage my health (/16)*	13.2 ± 2.8
Actively managing my health (/20)	14.6 ± 2.6
Social support for health (/20)	13.4 ± 8.2
Appraisal of health information (/20)	13.9 ± 4.0

Ability to actively engage with healthcare providers (/25)	22.0 ± 5.8
Navigating the healthcare system (/30)	26.1 ± 3.9
Ability to find good health information (/25)	23.1 ± 2.2
Understand health information well enough to know what to do (/25)	22.2 ± 6.2

* n = 22, Two participants could not provide answers to questions.

** n = 21, Three participants could not provide answers to questions.

*** High adherence (ARMS score <12), medium adherence (ARMS score between 12 and 23) and low adherence (ARMS score >23).

For the BMQ, participants had a mean necessity score of 11.1 (SD=3.8), with a maximum of 22 and a minimum score of 5. These low BMQ-specific necessity scores suggest that participants in this study did not view their medicines as necessary. However, participants also recorded a mean BMQ-specific concern score of 18.8 (SD=3.3), signifying that while participants did not consider their medicines as necessary, they still did present concerns about their medicines. Overall, the study participants indicated a belief that medicines do more harm than good and that medicines are being overprescribed.

Majority of participants found navigating the healthcare system to be quite easy or very easy, however, 13% (n=3) of participants reported some degree of difficulty in finding health services they are entitled to and working out what the best healthcare option is for them. All participants with high adherence scores also reported being treated with respect and dignity. Using the HLQ, participants were assessed as highly satisfied with their experience and relationship with their doctor, with 71% (n=17) of participants reporting that they felt that their needs were accounted for by their doctor.

All participants, including those exposed to suboptimal prescribing, recorded moderate to high adherence levels. Almost all (23/24 participants) disagreed or strongly disagreed with the statement "My doctor/s talk about my medicine/s as if I am not there" using the MRB-QoL. While 83% of participants agreed that they were comfortable with the number of medicines they had been taking, 54% of participants also agreed that they would be willing to stop one or more of their regular medicines if their doctor said it was possible (Table 3).

TABLE 3. PARTICIPANTS ATTITUDES TOWARDS DEPRESCRIBING (PATD) AS RECORDED ON THE PATD QUESTIONNAIRE, N (%) (N=24)

	Strongly Agree	Agree	Unsure	Disagree	Strongly disagree
I feel that I am taking a large number of medications.	1 (4)	4 (17)	2 (8)	9 (38)	8 (33)
I am comfortable with the number of medications that I am taking.	4 (17)	20 (83)	0 (0)	0 (0)	0 (0)
I believe that all my medications are necessary.	7 (29)	10 (42)	3 (12)	4 (17)	0 (0)
If my doctor said it was possible, I would be willing to stop one or more of my regular medications.	10 (42)	13 (54)	0 (0)	0 (0)	1 (4)
I would like to reduce the number of medications that I am taking.	5 (21)	10 (42)	3 (12)	6 (25)	0 (0)
I feel that I may be taking one or more medications that I no longer need. *	0 (0)	3 (12)	4 (17)	10 (42)	5 (21)
I would accept taking more medications for my health conditions.	6 (25)	16 (67)	1 (4)	0 (0)	1 (4)
I have a good understanding of the reasons I was prescribed each of my medications.	10 (42)	12 (50)	2 (8)	0 (0)	0 (0)
Having to pay for fewer medications would play a role in my willingness to stop one or more of my medications. **	1 (4)	1 (4)	1 (4)	9 (38)	11 (46)
I believe one or more of my medications is giving me side effects. **	1 (4)	2 (8)	4 (17)	8 (33)	8 (33)

* n= 22, Two participants could not answer the question.

** n = 23, One participant could not answer the question.

DISCUSSION

This study explored how beliefs, experiences, and health literacy may influence medicines use in people aged 65 years or above living in Australia. Although the mean number of medicines used by participants was below the cut point for polypharmacy, participants still believed that medicines were being overprescribed. In addition, while adherence is a growing issue in older adults, no participant presented with low medicine adherence. Therefore, while participants may have general beliefs that medicines may do more harm than good and are concerned about medicines, it was found that these beliefs do not influence adherence.

The BMQ results showed that participants in this study did not view their medicines as necessary but still have concerns about them. Most participants believed that medicines do more harm than good and that physicians are overprescribing medicines. Previous studies have shown that participants with high necessity and low concern exhibit higher adherence [5, 6]. However, in this study, participants with moderate to high adherence levels had low necessity and high concern scores. Similarly, participants with polypharmacy also had similar beliefs. All participants recorded moderate to high adherence levels. These findings suggest that participants' general beliefs about medicines may not necessarily influence their medicine use. Additionally, although the mean number of medicines reported by participants was four, they still believed that medicines are being overprescribed. This suggests that participants viewed four medicines as too many, even though polypharmacy is defined as the use of five or more medicines used concurrently.

Previous research has shown that trust in healthcare providers and a positive therapeutic relationship can improve medicine use. This study found that participants who trusted their prescriber and felt that their needs were being met were more likely to adhere to their medication regimen. Additionally, individual experience was found to be an important factor in participants' attitudes towards their medications. These findings are consistent with previous research and suggest that building trust and a positive therapeutic relationship with healthcare providers can improve medicine use and clinical outcomes [9, 10].

This study found that there may be a link between education level and medication adherence. Previous studies have found that education and healthcare barriers are associated with medication adherence. For example, a study of 140 African American men with HIV found that higher education levels were associated with higher adherence [24]. This study also suggests that people may face challenges understanding information and participating in decision-making. Previous research has shown that seeing the right healthcare provider and finding the best possible healthcare can improve medication use [25]. Health literacy allows people greater access to information and make informed choices, ultimately improving clinical outcomes.

IMPLICATIONS FOR PRACTICE

Understanding the factors influencing medication use is important for improving clinical outcomes and safety. This study found that experiences, such as therapeutic relationships, can influence medication use. However, beliefs about medications may not always influence medication use. More research is needed to understand the influence of these factors. Clinicians should be mindful of patients' beliefs, experiences and attitudes when interacting with patients.

FUTURE RESEARCH

While beliefs, experiences, and health literacy are important factors for health professionals to consider, more research is needed to understand their true association on medication use in older adults. Future studies should analyse the correlation between these factors and medication use and incorporate a larger sample size to provide more generalisable results.

STRENGTHS AND LIMITATIONS

This study demonstrated several strengths. Firstly, participants were recruited from three Australian cities: Melbourne, Brisbane, and Cairns, enhancing the geographical diversity of the sample. The interviews were well-structured, and interviewers received centralized training prior to data collection, ensuring consistency and reliability in the interview. Furthermore, participants were given the flexibility to choose between conducting the interview in their own homes or online, with the option of having a caregiver or family member present. This approach aimed to enhance participant comfort, reduce anxiety, and promote more accurate responses.

However, the study also had certain limitations. Firstly, the use of self-reported questionnaires introduces potential sources of error, including response bias, dishonesty, or overestimation of medication adherence. Secondly, the

small sample size of 24 participants may limit the generalizability of the findings to the broader population of Australians aged 65 years and older. It is important to note that this study was conducted as an exploratory study, hence the small sample size. It is anticipated that the current sample size will constitute approximately 10-15% of the intended sample size to be recruited in the future study. While this may not be completely representative of this population, we aim to explore the influence of these factors in a larger, more representative sample. Thirdly, Due to the small sample size, no further statistical analysis could be completed. Lastly, application of the STOPP criteria was not fully possible due to the lack of available estimates of participant renal function. Finally, the 24 participants exhibited inconsistencies in reporting their medications and levels of independence, which may have impacted the accuracy and representativeness of the findings.

CONCLUSIONS

The study found that older adults may feel they are taking too many medications, even if they are taking fewer than five regular medications. Social support, accessible guidelines, and strong relationships with healthcare professionals may help improve medication use in older adults. Future studies with larger cohorts are needed to better understand the effects of beliefs, experiences, and health literacy on medication use in older adults.

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DECLARATIONS OF INTEREST:

None.

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APPENDIX: SUPPLEMENTARY MATERIAL

SUPPLEMENTARY TABLE 1. ADHERENCE SCORES RELATIVE TO PARTICIPANT AGE, SEX, EDUCATION AND COUNTRY OF BIRTH (N=24)

Variables	Total (n=24) n (%)	Adherence (ARMS[a] score), n (%)		
		High (n<12)	Moderate (12-23)	Low (n>23)
Age, years (range 65-88)				
65-74	15 (63)	7 (47)	8 (53)	0 (0)
≥75	9 (38)	3 (33)	6 (67)	0 (0)
Sex				
Male	12 (50)	3 (25)	9 (75)	0 (0)
Female	12 (50)	6 (50)	6 (50)	0 (0)
Country of Birth				
Australia	16 (67)	3 (19)	13 (81)	0 (0)
Overseas	8 (33)	4 (50)	4 (50)	0 (0)
Education				
Primary school or equivalent	1 (4)	1 (100)	0 (0)	0 (0)
Secondary school or equivalent	8 (33)	2 (25)	6 (75)	0 (0)
Tertiary level or equivalent	15 (63)	7 (47)	8 (53)	0 (0)

[a] Participants were divided by adherence level as high adherence (ARMS score <12; n=10, 41.7%), medium adherence (ARMS score between 12 and 23, n=14, 58.3%) and low adherence (ARMS score >23; n=0, 0.0%).

SUPPLEMENTARY TABLE 2. SYMPTOMS ATTRIBUTED TO MEDICINES SIDE EFFECTS

	Frequency (mean ± SD)	Severity (mean ± SD)
Nausea	0.2 ± 0.6	0.1 ± 0.3
Constipation	0.4 ± 0.8	0.3 ± 0.7
Diarrhoea	0.5 ± 0.7	0.3 ± 0.6
Abdominal Pain	0.2 ± 0.5	0.1 ± 0.3
Dry mouth	0.6 ± 1.2	0.2 ± 0.6
Dizziness	0.2 ± 0.5	0.2 ± 0.6
Headache	0.1 ± 0.4	0.1 ± 0.4
Insomnia	0.3 ± 0.8	0.04 ± 0.2
Skin rash or itch	0.1 ± 0.3	0.1 ± 0.4
Cough	0.2 ± 0.6	0.04 ± 0.2
Ankle swelling	0.04 ± 0.2	0.0 ± 0.0
Dry eyes	0.25 ± 0.7	0.1 ± 0.4
Other	0.0 ± 0.0	0.0 ± 0.0
Total	3.2 ± 7.3	1.6 ± 4.7