Knowledge, Attitude, and Practice Regarding Polypharmacy and Potentially Inappropriate Medication Use Among General Practitioners in Urban Beijing: A Postprint Analysis

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Abstract

Background Polypharmacy and potentially inappropriate medication (PIM) are relatively common among community-dwelling elderly. Current research focusing on patients is relatively abundant, while research on general practitioners' knowledge, attitudes, and practices (KAP) is relatively scarce.

Objective To investigate the current status of knowledge, attitudes, and practices regarding polypharmacy and PIM in the elderly among general practitioners in urban areas of Beijing, and to provide reference for improving polypharmacy and PIM in older adults.

Methods Using convenience sampling method, in August 2022, general practitioners working in general practice positions with independent prescribing authority were selected as study subjects. Electronic questionnaires were distributed in WeChat groups such as the "2020 Beijing Family Doctor Team Leader Training Camp Group" to conduct a cross-sectional survey. Finally, 150 questionnaires from general practitioners from 85 community health service centers in urban Beijing were selected as the sample for this study. The KAP related to polypharmacy and PIM in the elderly were scored. The final total score for each part of the questionnaire was calculated on a percentage basis (percentage score = actual score/total score × 100). Participants were divided into two groups based on the traditional passing score of 60: $ $60 group and <60 group.

Results Among the 150 general practitioners, regarding knowledge level of polypharmacy and PIM in the elderly: 140 scored <60, and 10 scored $ $60; regarding medication attitudes: 142 scored $ $60, and 8 scored <60; regarding prescribing behavior: 115 scored $ $60, and 35 scored <60. For knowledge level, there were no statistically significant differences between the <60 and $ $60

groups in age, gender, education level, professional title, Chinese/Western medicine position, years of work, or participation in medication training (P>0.05). For medication attitudes, there were no statistically significant differences between the <60 and $ $60 groups in age, gender, education level, professional title, Chinese/Western medicine position, years of work, or participation in medication training (P>0.05). For prescribing behavior, there were no statistically significant differences between the <60 and $ $60 groups in gender, education level, professional title, Chinese/Western medicine position, or participation in medication training (P>0.05); however, there were statistically significant differences in age and years of work (P<0.05).

Conclusion Community general practitioners in urban areas have positive attitudes toward polypharmacy and PIM in the elderly, but their knowledge level needs improvement and prescribing behavior has room for optimization. Continuing education should be strengthened in this area to improve cognitive level, further optimize prescribing behavior, and simultaneously enhance PIM management level and provide medication-related education for the elderly, in order to play an active role in improving polypharmacy and PIM among older adults.

Full Text

Knowledge, Attitudes, and Practice Toward Polypharmacy and Potentially Inappropriate Medication among General Practitioners in Urban Areas of Beijing, China: a Cross-sectional Study

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Abstract

Background: Polypharmacy and potentially inappropriate medication (PIM) are common among older adults. While current research has extensively focused on patient-related aspects, studies concerning general practitioners' knowledge, attitudes, and practice (KAP) in this regard remain limited.

Objective: This study aimed to investigate general practitioners' KAP regarding polypharmacy and PIM in older adults in urban Beijing, and to provide references for improving medication management in this population.

Methods: Employing a convenient sampling approach, we conducted a cross-sectional survey among general practitioners with independent prescribing authority in urban Beijing in August 2022. Electronic questionnaires were distributed through WeChat-based platforms targeting primary care practitioners. After screening, 150 respondents from 85 community health service centers were included in the final analysis. Participants were evaluated on their KAP related to polypharmacy and PIM in older adults. Scores for each domain were converted to a percentage system (calculated as actual score divided by total possible score × 100) and were categorized into two groups based on the conventional pass criterion of 60 points: $ $60 and <60.

Results: Among the 150 general practitioners, knowledge scores regarding polypharmacy and PIM in the elderly were below 60 in 140 participants (93.3%) and 60 or above in 10 (6.7%). In terms of medication attitudes, 142 participants (94.7%) scored 60 or above, while 8 (5.3%) scored below 60. Regarding prescribing behaviors, 115 participants (77.7%) scored 60 or above, and 35 (23.3%) scored below 60. The distribution of knowledge and attitude scores showed no statistically significant differences across age, gender, education level, professional title, type of practice (Traditional Chinese Medicine or Western medicine), years of practice, or participation in medication training (P>0.05). For prescribing behaviors, no significant differences were found in relation to gender, education level, professional title, type of practice, or training attendance (P>0.05). However, significant differences were identified in age and years of practice (P<0.05).

Conclusion: General practitioners in urban community settings demonstrate positive attitudes toward the management of polypharmacy and PIM among elderly patients. However, their knowledge remains inadequate, and prescribing behaviors show potential for improvement. There is a compelling need to enhance continuing medical education focused on geriatric pharmacotherapy, strengthen PIM management systems, and provide medication-related education for older adults. These measures are expected to facilitate more effective management of polypharmacy and PIM in the aging population.

Keywords: Potentially inappropriate medication list; General practitioners; Polypharmacy; Knowledge, attitudes, and practice

Introduction

Polypharmacy typically refers to the concurrent use of five or more medications [1]. Potentially inappropriate medication (PIM) is defined as medication use where the effectiveness is not established and/or the risk of adverse events may exceed the expected clinical benefit [2-4]. When patients use multiple medications, the likelihood of drug-drug interactions and adverse reactions increases significantly, making PIM more common [5-6]. Numerous domestic and international studies have shown that polypharmacy and PIM among older adults

are concerning, with age, number of diseases, and number of medications being influential factors that are difficult to modify [7-15]. Research has demonstrated that physicians' knowledge correlates with prescribing behavior [16], and that education for general practitioners can reduce PIM [17]. However, previous studies on physicians have focused on limited aspects [18-19], and comprehensive KAP studies remain scarce in China [20]. This investigation examines the current status of KAP regarding polypharmacy and PIM among urban general practitioners in Beijing to provide a reference for improving medication management in older adults.

Methods

Study Design and Participants

We conducted a cross-sectional survey in August 2022 using a convenient sampling method. Participants were general practitioners working in urban community health service centers in Beijing who held independent prescribing authority. Inclusion criteria were: (1) practicing in an urban community health service center in Beijing; (2) possessing independent prescribing authority; and (3) having good communication skills. Exclusion criteria included: (1) physicians from non-community health institutions (e.g., specialists from tertiary hospitals providing community outreach services); and (2) physicians not in general practice positions. Based on the principle that sample size should be 5-10 times the number of questionnaire items, we ultimately included 150 general practitioners.

Survey Instrument

We developed a self-administered questionnaire based on literature review [21]. The instrument comprised four sections: (1) sociodemographic information of general practitioners; (2) knowledge of polypharmacy and PIM in older adults; (3) attitudes toward polypharmacy and PIM; and (4) prescribing behaviors. Content was developed with reference to the Expert Consensus on Safe Management of Polypharmacy in Older Adults [22], the Beers Criteria (2019 edition) [23], the STOPP/START criteria (2014 edition) [24], and the Chinese Criteria for Potentially Inappropriate Medication in Older Adults (2017 edition) [25].

Data Collection

In August 2022, electronic questionnaires were distributed via WeChat groups, including the "2020 Beijing Family Doctor Team Leader Training Camp Group." Members of this group included nearly one general practitioner team leader from each community health service center in Beijing, providing good representativeness. The questionnaire was designed to allow only one response per WeChat account, and all questions had to be completed before submission. After collection, we verified respondents' membership in the target groups through WeChat ID comparison, retained questionnaires with completion times of at least one minute, and screened for IP addresses from Beijing urban areas. This process

yielded 226 valid questionnaires, from which we further selected 150 general practitioners as our study sample.

Evaluation Methods

The knowledge section contained six single-choice items, with one point for correct answers and zero for incorrect answers, yielding a total score of 0-6. Higher scores indicated greater knowledge of polypharmacy and PIM. The attitude section included six items rated on a 5-point Likert scale ("strongly disagree" to "strongly agree," scored 1-5), with a total possible score of 0-30. Higher scores indicated more positive attitudes. The prescribing behavior section comprised five items: one point was awarded for correct answers based on PIM criteria, while other items used a 4-point Likert scale where "often" and "always" scored 1 point and "never" and "occasionally" scored 0. The total behavior score ranged from 0-5, with higher scores indicating more appropriate prescribing practices. All section scores were converted to a percentage system using the formula: (actual score/total possible score) × 100. Participants were then divided into two groups using the conventional pass threshold of 60 points: $ $60 group and <60 group.

Statistical Analysis

We used SPSS 26.0 software for statistical analysis. Categorical data were described using relative frequencies and compared using chi-square tests or Fisher's exact test. Non-normally distributed continuous data were expressed as median (Q1, Q3). Statistical significance was set at $P<0.05$.

Results

Participant Characteristics

Among the 150 participating general practitioners, 79 (52.7%) were aged 35-44 years, 116 (77.3%) were female, 110 (73.3%) held bachelor' s degrees, 97 (64.7%) were attending physicians, 107 (71.3%) were Western medicine practitioners, 101 (67.3%) had more than 10 years of practice experience, and 133 (88.7%) had participated in medication training. Detailed characteristics are presented in .

Knowledge Levels

The median percentage score for knowledge of polypharmacy and PIM was 33.3 (16.7, 50.0). Only 10 participants (6.7%) scored $ $60, while 140 (93.3%) scored <60. Specific knowledge item performance is detailed in . Correct responses included: definition of polypharmacy (37 participants, 24.7%); risks of benzodiazepines in older adults (64, 42.7%); comparison of gastrointestinal bleeding risk between novel anticoagulants and warfarin in atrial fibrillation patients $ $75 years (8, 5.3%); reasons for dose reduction or discontinuation of full-dose PPIs

after 8 weeks (48, 32.0%); rationale for cautious use or avoidance of NSAIDs in elderly heart failure patients (77, 51.3%); and risk points for clopidogrel (37, 24.7%).

Medication Attitudes

Attitudes were assessed through questions regarding concern about polypharmacy and PIM, beliefs about deprescribing, willingness to participate in training, and support for embedding clinical decision support systems. The median attitude score was 93.3 (83.3, 100.0), with 142 participants (94.7%) scoring $ $60 and 8 (5.3%) scoring <60. Detailed attitude data are shown in .

Prescribing Behaviors

Behavior assessment examined whether physicians instructed patients to maintain medication lists, knowledge of patients' medication counts, first-line treatment choices for pain, prescribing patterns for benzodiazepines and related hypnotics for insomnia, and deprescribing practices. The median behavior score was 60.0 (60.0, 80.0), with 115 participants (77.7%) scoring $ $60 and 35 (23.3%) scoring <60. Detailed behavior data are presented in .

KAP Distribution by Characteristics

Knowledge score distribution showed no statistically significant differences between the $ $60 and <60 groups across age, gender, education level, professional title, type of practice, years of practice, or medication training participation ($P>0.05$). Similarly, attitude score distribution showed no significant differences across these characteristics ($P>0.05$). For prescribing behaviors, no significant differences were found between groups for gender, education level, professional title, type of practice, or training participation ($P>0.05$). However, significant differences were observed for age and years of practice ($P<0.05$). The comparative distribution is detailed in .

Discussion

Previous research on polypharmacy and PIM in older adults has primarily focused on patient factors such as age, disease burden, and number of medications [7-15], with few domestic studies examining physician KAP [20]. This study investigated the current KAP status among urban Beijing general practitioners regarding polypharmacy and PIM to inform strategies for improving medication management in older adults.

Our findings reveal low knowledge levels but positive attitudes and intermediate prescribing behaviors among general practitioners, consistent with previous research [20]. Regarding knowledge, fewer than one-quarter of participants correctly defined polypharmacy, similar to earlier studies [26]. Polypharmacy significantly increases the risk of adverse drug reactions, reduces quality of life, and

elevates risks of hospitalization, mortality, and healthcare costs [27]. Research indicates that reducing polypharmacy is an important strategy for preventing and managing frailty [28]. Participants performed poorest on the item comparing gastrointestinal bleeding risk between novel anticoagulants and warfarin for atrial fibrillation in patients $ $75 years. While novel agents offer advantages over warfarin and are widely used, they carry greater risk of major gastrointestinal bleeding in patients $ $75 years [29-30]. General practitioners' reliance on personal experience and package inserts may limit their ability to reduce polypharmacy and PIM; enhanced use of PIM assessment tools could improve outcomes [31].

Attitude scores were highest, with over 90% of surveyed physicians expressing willingness or strong willingness to participate in relevant training, indicating positive attitudes toward learning. Prescribing behaviors were at an intermediate level, likely related to insufficient knowledge of polypharmacy and PIM. Studies show that targeted education for general practitioners can rapidly improve knowledge and significantly enhance prescribing behaviors [32]. PIM is also associated with patient-specific factors including age, disease type, and medication count [33]. Research demonstrates that most older patients with chronic diseases are willing to undergo deprescribing with physician approval [34-35].

We found statistically significant differences in prescribing behaviors across age and years of practice, consistent with previous findings [16,36]. Physicians under 35 years old with 1-10 years of practice demonstrated better prescribing behaviors, similar to other studies [37]. As physicians age and gain experience, their physical and cognitive abilities may decline, reducing their capacity to assimilate new knowledge and affecting prescribing practices. We recommend implementing diverse training programs on polypharmacy and PIM for general practitioners to improve their understanding of assessment tools, enhance identification of problematic prescribing, and reduce PIM prescriptions [17]. Non-pharmacological management strategies—including dietary counseling, exercise guidance, disease management, and psychological support—should be used to facilitate deprescribing. Additionally, patient education on medication-related issues and the establishment of computerized monitoring systems for polypharmacy and PIM can provide reminders and quality control [28], thereby improving overall management and potentially enhancing health outcomes for older adults [38].

Conclusion

General practitioners in urban Beijing community settings demonstrate positive attitudes toward managing polypharmacy and PIM in older adults, but their knowledge is inadequate and prescribing behaviors require optimization. Continuing education should be strengthened to improve cognitive understanding and prescribing practices. Simultaneously, PIM management capabilities should be enhanced through patient education and non-pharmacological interventions, enabling general practitioners to play an active role in improving medication

safety for older adults.

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TABLE:1 General practitioners background information (n=150)

TABLE:2 Knowledge assessment of general practitioners (n=150)

TABLE:3 Medication-related attitudes of general practitioners (n=150)

TABLE:4 Prescribing behaviors of general practitioners (n=150)

TABLE:5 Comparative distribution of KAP among general practitioners

Note: Figure translations are in progress. See original paper for figures.