BMC Primary Care

RESEARCH

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Polypharmacy among adults receiving outpatient care at Kitgum General Hospital, Northern Uganda

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Abstract

Background Polypharmacy is a major safety concern, associated with adverse outcomes, higher health services utilization, and healthcare costs. However, there is limited data on polypharmacy in the outpatient settings in semi-urban primary care settings. We assessed the prevalence and factors associated with polypharmacy among adults receiving outpatient care at Kitgum General Hospital, Uganda.

Methods We conducted a facility-based, cross-sectional study among adults receiving outpatient care at Kitgum General Hospital between October and December 2023. Polypharmacy was defined as the concurrent use of five or more medicines. Data was collected using a structured tool. A multivariable logistic regression analysis was performed to assess the factors associated with polypharmacy.

Results A total of 422 participants, with a mean age of 43.0 ± 18.3 years were enrolled. More than a third of the participants (35.3%, $n=149$) had chronic medical conditions. Overall, 43.4% ($n=183$) (95% CI: 38.7–48.2) of the participants had polypharmacy. The majority were on antibiotics (91.8%, $n=168$) and analgesics (77.6%, $n=142$). In total, 145 (34.4%) reported use of over-the-counter drugs and 60 (14.2) used herbal medicines. Having a chronic illness (Adjusted Odds Ratio (aOR): 5.93, 95% CI: 3.10–11.34, $p<0.001$), and use of over-the-counter drugs (aOR: 16.7; 95% CI: 8.87–31.42, $p=0.009$) were associated with higher odds of polypharmacy. Herbal medicine use was associated with 64% lower odds of polypharmacy (aOR: 0.36; 95% CI: 0.17–0.77, $p<0.001$).

Conclusion Polypharmacy was observed in almost 2 in every 5 adults receiving outpatient care in Kitgum General Hospital. Chronic illness and use of over the counter medicines increased the odds of polypharmacy among adult outpatients. Priority should be put in place to mitigate polypharmacy among outpatients in Northern Uganda and similar low resource settings.

Keywords Polypharmacy, Outpatient, Kitgum General Hospital, Uganda

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Background

Polypharmacy is commonly defined as the practice of concurrent use of five or more medications [1]. However, some complex patients with multi-morbidity and conditions such as heart failure, tuberculosis and human immunodeficiency virus (HIV) infection may benefit from polypharmacy as an appropriate guideline directed medical therapy [2]. While polypharmacy can be beneficial for these group of patients, it is also linked to increased healthcare costs, medication errors, hospitalization, and adverse health outcomes such as drug-drug interaction incidents, adverse drug reactions, increased risk of geriatric syndrome (such as falls, and fracture), low cognitive functions, renal impairment, sarcopenia, and hospitalization. Studies have shown that polypharmacy is one of the most significant factors that may lead to patients' nonadherence to drugs [3–5]. Polypharmacy is an expensive practice, that results in a significant economic burden to the health care system and patients [6].

Polypharmacy is associated with increased clinic visits and rehospitalization, with an approximately 30% increase in medical costs [6, 7]. The worldwide prevalence of polypharmacy ranges from 10 to 90% depending on age, definition used, health care system and geographical setting [8]. In Sweden, 44% of people over 65 years had polypharmacy [9], 46% among outpatients in Saudi Arabia [10], and 56% among individuals aged 80 years or older in Poland [11]. A more recent study from South Africa found about 12 medicines prescribed on average to geriatric outpatients [12]. In Uganda, polypharmacy among older adults with HIV on anti-retroviral therapy (ART) was 15.3% [13]. In addition, a study in Uganda among inpatients with heart failure found the prevalence of adverse drug reactions at 56% and was highly associated with polypharmacy [14].

Studies from developed countries reports overweight, obesity, comorbidities, frailty, sex, and mental illness such as dementia and old age to be significantly associated with polypharmacy [3, 10]. Most studies on polypharmacy in Uganda focused on specific populations such as older people living with HIV, in patients with heart failure and other comorbidities [13, 14]. There is limited information on the prevalence and factors associated with polypharmacy among general adult outpatients in Uganda. Therefore, we aimed to determine the prevalence and factors associated with polypharmacy among adults receiving outpatient care at Kitgum General Hospital, Kitgum district, Northern Uganda.

Methods

Study design and setting

Between October and December 2023, we conducted a healthcare facility-based, cross-sectional study among adults receiving outpatient care at the outpatient department (OPD) of Kitgum General Hospital, a public hospital located in Kitgum District, Northern Uganda.

Study population

Participants in this study were adults aged 18 years and above, receiving outpatient care at Kitgum General Hospital during the study period. Patients who were critically ill or required immediate medical attention, as determined by healthcare providers were excluded. A sampling frame was made. The study participants were obtained by systematic sampling. The first participant was recruited after tossing a coin and obtaining the head. The subsequent participant was recruited after every 5 th adult patient until required sample size reached.

Sample size

The sample size was calculated using the survey formula by Kish Leslie (1965);

$$N = \frac{z^2 x p(1-p)}{d^2}$$

where z = z value at 95% confidence interval = 1.96.

P = Proportion of 50% (0.5) was used since prevalence of polypharmacy among adults receiving outpatient care in Uganda is unknown.

d = Precision/acceptable error (0.05)

$$N = \frac{1.96^2 X 0.5(1-0.5)}{0.05^2}$$

= 384.16, Factoring in a non-response rate of 10% gives a final minimum sample size of 422 participants.

Data collection

The questionnaire used was adapted from previous studies on polypharmacy [10, 13, 15] to capture the specific context of outpatient care at Kitgum General Hospital and pretested but the participants were not used in the study. In addition, questionnaire was translated into Acholi language and back translated to English. The tool captured information on the different number of medicines a person is on in a day. Additional data included demographic characteristics such as age, sex, obesity, comorbidities, educational level and so on. The study tool was administered by trained research assistants who are nurses working in the OPD. The questionnaires were administered face-to-face by the research assistants who explained the purpose of the study and ensured confidentiality of responses. Data collection was conducted in a private and comfortable room to encourage open and honest responses.

Variables

The outcome variable polypharmacy was defined as concurrent use of five or more medicines (1). Independent variables included socio-demographics characteristics; age, sex, body mass index (BMI), smoking, use of over-the-counter drugs and educational level, medical factors; chronic conditions (for example hypertension, diabetes mellitus), hospitalization, and other comorbidities, health system-related factors; cadre and experience of the prescriber.

Statistical analysis

Data was analyzed using STATA software version 15.0. Categorical variables were summarized as frequencies and percentages and continuous variables were expressed in terms of mean and standard deviation for normally distributed variables or median and interquartile range for non-normally distributed variables. All analyses were two-tailed, set at a 95% confidence interval (95% CI) and a $p < 0.05$ was considered statistically significant. The prevalence of polypharmacy was determined by dividing the number of participants taking five or more drugs currently by the total participants and the finding expressed as a percentage. To determine factors associated with polypharmacy, we conducted both bivariable and multivariable analyses.

Simple logistic regression was performed for bivariable data analysis and results presented as crude odds ratios (cOR) with corresponding CIs and *p*-values. Variables with $p < 0.2$ at bivariable analysis and biologically plausible factors such as old age were forwarded to logistic regression models for multivariable analysis. Before running the multivariable logistic regression, we checked the variables for multicollinearity using variance inflation factor (VIF) analysis with variables having VIF > 10 considered to have collinearity. There was no multicollinearity among the variables with the highest VIF of 5.48 for marital status, followed by 4.89 for number of OPD visits in the last 12 months to the time of data collection. We entered the independent variables at the beginning step of the model building. Utilizing a stepwise, backward elimination method, we subsequently, removed each factor with the least *p*-value while testing the model fit using the goodness-of-fit test [16] to obtain the best-fit model. Multivariable analysis results were reported using the adjusted odds ratios (aOR), with corresponding 95% CI and *p*-values.

Results

Socio-demographic characteristics of the participants

A total of 422 participants were enrolled. More than two-thirds (68.5%, $n = 289$) were females and 61.6% ($n = 260$) were married. The mean age ± Standard Deviation of all the participants was 43.0 ± 18.3 years. More than half (52.6%, $n = 222$) were unemployed and 57.8% ($n = 244$) had an average monthly income of less than 120,000 Uganda Shilling (32.4 US Dollar) (Table 1).

Table 1 Sociodemographic characteristics of the participants ($n = 422$); Alcohol intake ($n = 143$)

Characteristic	Frequency	Percentage
Age (mean, Standard Deviation)	43.0	18.3
Age group		
18–35	174	41.2
36–64	174	41.2
≥ 65	74	17.6
Gender		
Male	133	31.5
Female	289	68.5
Residence		
Urban	214	50.7
Rural	208	49.3
Marital status		
Single	66	15.6
Married	260	61.6
Separated	42	10.0
Widowed	54	12.8
Education level		
No formal education	121	28.7
Primary	127	30.1
Secondary	127	30.1
Tertiary	47	11.1
Employment Status		
Employed	150	35.6
Unemployed	222	52.6
Student	50	11.8
Average monthly income		
< 120,000 UGX	244	57.8
120,000–240,000 UGX	68	16.1
> 240,000 UGX	110	26.1
Smoking status		
Never smoked	384	91.0
Current smoker	17	4.0
Ex-smoker	21	5.0
Alcohol intake		
No	279	66.1
Yes	143	33.9
Duration of alcohol intake		
< 5 years	30	21.0
5–10 years	48	33.6
> 10 years	65	45.4

Abbreviation: UGX-Currency in Uganda Shillings

1 US Dollar was on average equivalent to 3,700 UGX during the year of the study

Table 2 Clinical characteristics of adults receiving outpatient care at Kitgum General Hospital, Uganda ($n = 422$)

Characteristic	Frequency	Percentage
Has a chronic medical condition	$n = 422$	
No	273	64.7
Yes	149	35.3
Chronic medical condition	$n = 149$	
Hypertension	57	38.3
Diabetes	26	17.4
HIV	19	12.7
Epilepsy	3	2.0
TB	1	0.7
Asthma	3	2.0
Arthritis	15	10.1
Others	25	16.8
Duration of a chronic condition	$n = 149$	
< 5 years	50	33.6
5–10 years	51	34.2
> 10 years	48	32.2
Number of outpatient department Visits in last 12 months	$n = 422$	
1 time	57	13.5
2 times	106	25.1
≥ 3 times	259	61.4
Received a prescription at outpatient department	$n = 422$	
Always	357	84.6
Sometimes	64	15.2
Just consultation, no medicine	1	0.2
Hospitalization in the last 12 months	$n = 422$	
No	321	76.1
Yes	101	23.9
Frequency of Hospitalization	$n = 101$	
1 time	50	49.5
2 times	29	28.7
≥ 3 times	22	21.8
Herbal medicine intake	$n = 422$	
No	362	85.8
Yes	60	14.2
Self-reported health status	$n = 422$	
Poor	68	16.1
Fair	219	51.9
Good	110	26.1
Very good	24	5.7
Excellent/Healthy	1	0.2
Physical Activity	$n = 422$	
Sedentary (< 1 h/day)	123	29.1
Moderate (1–3 h/day)	205	48.6
Vigorous (> 3 h/day)	94	22.3
Body Mass Index	$n = 422$	
< 18.5 (Underweight)	84	19.9
18.5–24.9 (Normal weight)	280	66.4
25–29.9 (Overweight)	49	11.6
≥ 30 (Obese)	9	2.1

Abbreviation: HIV-Human Immunodeficiency Virus, OPD-Outpatient Department, TB-Tuberculosis

Clinical characteristics of adults receiving outpatient care at Kitgum General Hospital

Slightly more than a third of the participants (35.3%, $n=$ 149) had a chronic medical condition. Among those with chronic medical conditions, the majority had hypertension (38.3%, $n=$ 57) and followed by diabetes mellitus (17.5%, $n=$ 26). Majority of the participants (61.4%, $n=$ 259) had visited OPD three times or more in the last 12 months. More than two-thirds (84.6%, $n=$ 357) received a prescription for medicines whenever they came for consultation in OPD. 14.2% of the participants reported intake of herbal medicine in the last 6 months and two-thirds 66.4% of the participants had normal BMI and only 2.1% were obese (Table 2). Less than a tenth (8.8%, $n=$ 37) reported experiencing side effects and more than half (66.6%, $n=$ 281) received the prescriptions from a clinical officer. Slightly more than a third (34.4%, $n=$ 145) of the participants reported use of over-the-counter drugs (Table 3).

Table 3 Medicine intake among adults receiving outpatient care at Kitgum General Hospital, Uganda ($n=422$)

Factors	Frequency	Percentage
Number of medicines taken concurrently daily	$n=422$	
Five or more (polypharmacy)	183	43.4
Less than five	239	56.6
Over-the-counter Drugs intake	$n=422$	
No	277	65.6
Yes	145	34.4
Management of medicine intake	$n=422$	
Independently	379	89.8
With Assistance from caregivers	37	8.8
HCP administered	6	1.4
Had Side Effects	$n=422$	
No	385	91.2
Yes	37	8.8
Side Effects	$n=37$	
Body rashes and itching	6	16.2
GIT Disturbance	14	37.9
Difficulty with adherence	6	16.2
Tinnitus	1	2.7
Headache	6	16.2
Dizziness	4	10.8
Cadre of prescriber	$n=422$	
Nurse	18	4.3
Clinical officer	281	66.6
Medical officer	85	20.1
Pharmacist	16	3.8
Specialist	22	5.2

Abbreviation: HCP-Health care provider, GIT-Gastro intestinal tract

Factors associated with polypharmacy among adults receiving outpatient care at Kitgum General Hospital, Uganda

Results from bivariable analysis indicated that several factors had significant associations with polypharmacy. Factors that showed positive associations with polypharmacy included: older age group >65 years ($p<0.001$), widowed ($p<0.001$), having a chronic illness ($p<0.001$), having had hospitalization in the last 12 months ($p<0.005$), having BMI >30 that is obese adults ($p<0.02$), having had 3 or more OPD visits in the last 6 months ($p<0.01$) and use of over-the-counter drugs ($p<0.001$). At the multivariable level after controlling for several polypharmacy-related variables, factors associated with polypharmacy include; having a chronic illness (AOR: 5.93 95% CI: 3.10–11.34, $p<0.001$), use of over-the-counter drugs (AOR: 16.7; 95% CI: 8.87–31.42, $p<0.001$) and herbal medicine intake (AOR: 0.36; 95% CI: 0.17–0.77, $p=0.009$). The odds of polypharmacy among participants with chronic illnesses were 5.93 times higher than that among adult outpatients without chronic illness, participants who were taking over-the-counter drugs had 16.7 times higher odds of polypharmacy compared to those not using over-the-counter drugs and the participants who were taking herbal medicines had 64% lower risk of polypharmacy than adults not taking herbal medicines (Table 4).

Medicine intake and factors influencing polypharmacy among adults receiving outpatient care at Kitgum General Hospital, Uganda

In total, 183 (43.4%; 95% CI: 38.7–48.2) participants had polypharmacy. Among the participants who had polypharmacy, most were taking antibiotics (91.8%, $n=$ 168), analgesics (77.6%, $n=$ 142), antiallergics, (33.3%, $n=$ 61), antihypertensives (31.7%, $n=58$), supplements (29.0%, $n=$ 53), antiacids (24.0%, $n=44$), and antidiabetics (17.5%, $n=$ 32) (Fig. 1). Most reported over-the-counter drugs used were analgesics (40.0%, $n=58$), antibiotics (36.6%, $n=53$), antimalarials (24.8%, $n=$ 36), antiallergics (23.4%, $n=34$), and supplements (18.6%, $n=27$) (Fig. 2). Most of the participants ($n=$ 160) disagree that the healthcare providers explained the purpose and potential side effects of medicine, ($n=$ 173) agree that they feel comfortable discussing their medication regiments and concern with their healthcare provider, ($n=$ 228) disagree that sometime they request specific medications and ($n=161$) disagree that they have missed taking their medication (Fig. 3).

Discussion

The prevalence of polypharmacy in this study was high at 43.4%. The factors associated with polypharmacy were, having a chronic illness, use of over-the-counter drugs and

Table 4 Bivariable and multivariable analyses of factors associated with polypharmacy among participants

Factors	Bivariate		Multivariate	
	Crude OR (95% CI)	***p-value***	**Adjusted OR (95% CI)**	***p-value***
Age group				
18–35	1	Ref	1	Ref
36–64	2.22 (1.43–3.44)	< 0.001**	1.06 (0.53–2.12)	0.876
≥ 65	2.92 (1.66–5.11)	< 0.001**	0.73 (0.27–2.00)	0.547
Gender				
Male	1	Ref	-	-
Female	0.86 (0.57–1.30)	0.482		
Residence				
Urban	1	Ref	-	-
Rural	0.92 (0.62–1.35)	0.666		
Marital status				
Single	1	Ref	-	-
Married	1.84 (1.01–3.33)	0.046		
Separated	2.42 (1.08–5.46)	0.033**		
Widowed	6.93 (3.10–15.51)	< 0.001**		
Employment Status				
Employed	1	Ref	-	-
Unemployed	1 (0.66–1.51)	0.989		
Student	0.64 (0.33–1.24)	0.287		
Average monthly income				
< 120,000 UGX	1	Ref	-	-
120,000–240,000 UGX	1.05 (0.61–1.81)	0.853		
> 240,000 UGX	1.32 (0.84–2.07)	0.234		
Chronic medical condition				
No	1	Ref	1	Ref
Yes	4.25 (2.78–6.50)	< 0.001**	15.93 (3.10–11.34)	< 0.001***
Hospitalization in the last 12 months				
No	1	Ref	1	Ref
Yes	1.9 (1.21–2.99)	0.005**	1.32 (0.71–2.46)	0.387
Herbal medicine intake				
No	1	Ref	1	Ref
Yes	0.72 (0.41–1.27)	0.260	0.36 (0.17–0.77)	0.009***
BMI				
< 18.5 (Underweight)	1	Ref	1	Ref
18.5–24.9 (Normal weight)	1.52 (0.91–2.54)	0.108*	1.64 (0.81–3.30)	0.168
25–29.9 (Overweight)	2.45 (1.19–5.06)	0.015**	2.48 (0.90–6.82)	0.078
≥ 30 (Obese)	7 (1.36–35.93)	0.020**	6.32 (0.71–56.34)	0.098
OPD Visit in the last 12 months				
1 time	1	Ref	1	Ref
2 times	1.89 (0.94–3.79)	0.072*	2.03 (0.82–5.02)	0.123
3 or more times	2.28 (1.22–4.27)	0.010**	1.72 (0.75–3.95)	0.200
Use of Over-the-counter drugs				
No	1	Ref	1	Ref
Yes	6.7 (4.28–10.49)	< 0.001**	16.7 (8.87–31.42)	< 0.001***
Alcohol intake				
No	1	Ref	-	-
Yes	1.41 (0.94–2.11)	0.098*		

Table 4 (continued)

Factors	Bivariate		Multivariate	
	Crude OR (95% CI)	*p-value*	Adjusted OR (95% CI)	*p-value*
Smoking status				
Current smoker	1	Ref	-	-
Ex-smoker	0.56 (0.19–1.62)	0.283		
Never smoked	2.68 (1.06–6.80)	0.037**		
Cadre of prescriber				
Nurse	1	Ref	-	-
Clinical officer	1.37 (0.50–3.74)	0.545		
Medical officer	1.86 (0.64–5.42)	0.253		
Pharmacist	2 (0.50–8.00)	0.327		
Specialist	3.5 (0.94–12.97)	0.361		

* Marginally significant on bivariable analysis ($p \leq 0.05 < 0.2$), **significant on bivariable analysis ($p < 0.05$), ***significant after multivariable analysis, CI- Confidence Interval, OR- odds ratio, UGX-Currency in Uganda Shilling, the dash (-) sign in multivariable analysis means the variable was not used in the final model

herbal medicine use. The prevalence of polypharmacy of 43.4% in our study is comparable to reported studies done in Sweden among patients >65 years of age [9] and in Saudi Arabia among outpatients [10] which found prevalence of polypharmacy at 44% and 46% respectively. This observed similarity could be because all these studies were done among only the outpatients. However, our finding is lower than that reported from a study in Poland among elderly patients >80 years [11] which revealed that 56% of the elderly patients were receiving polypharmacy prescriptions. Our finding is also lower than a study done in South Africa [12] which showed about 12 medicines prescribed on average to geriatric outpatients. The observed difference could be because most elderly patients have one or more comorbidities hence at high risk of polypharmacy as compared to our study population which included all adult outpatients aged 18 years and above. Furthermore, elderly patients always see more than one Physician due to their comorbidities hence at risk of receiving multiple prescriptions [17]. Interestingly, the prevalence of polypharmacy in our study was higher than that of a previous study among adult outpatients over 50 years with HIV in an urban clinic, Kampala Uganda [13], which reported a prevalence of 15.3%. This observed difference could be because in our study the participants were sick patients who had come to get medical care however, in the study done among people with HIV in Kampala, Uganda, most of the clients were not sick and they had gone just for the refill of their ART and secondly, the study population were also difference from our study population. Additionally, we also accounted for any ongoing medicines the participant was taking.

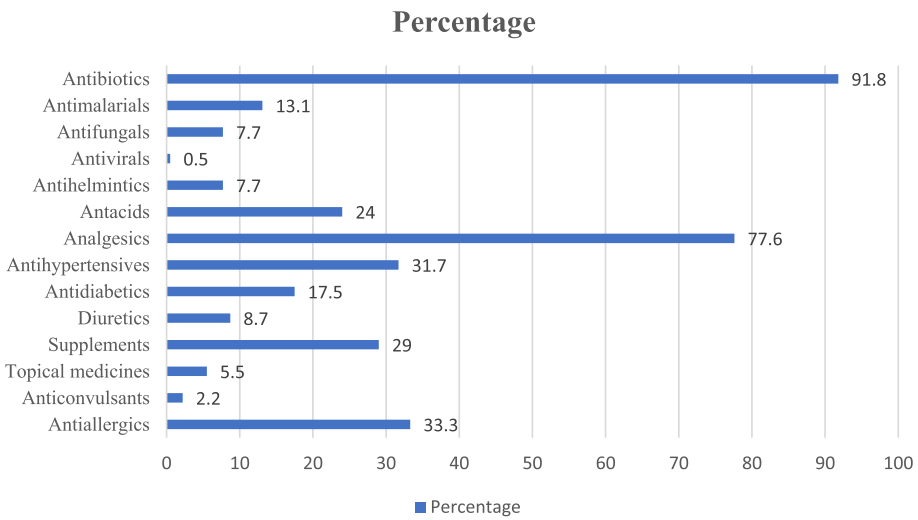

Fig. 1 Medicine use by pharmacological class among study participants with polypharmacy

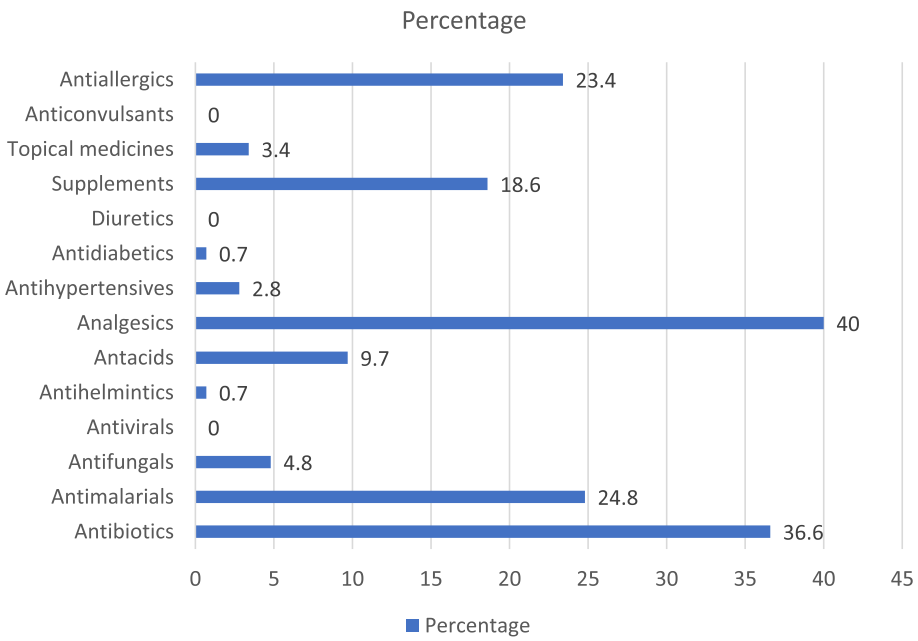

Fig. 2 Over-the-counter drugs use by pharmacological class among the study participants

Furthermore, our study findings showed that among adults who had polypharmacy, 91.8% were taking antibiotics and 77.6% were taking analgesics. Also, over 34.4% were taking over-the-counter drugs. These findings are comparable with a study in Eastern Uganda [18]. In addition, this polypharmacy may predispose them to medication errors, hospitalization, and adverse health outcomes such as drug-drug interaction incidents, adverse drug reactions, increased risk of geriatric syndrome, low cognitive functions, renal impairment, sarcopenia, hospitalization and nonadherence to drugs [3–5].

This study found polypharmacy more common among participants with chronic illnesses. This could be because adult outpatients who have chronic illnesses may have multiple medical complications, and their management requires the use of multiple medications to control the disease. Our finding is consistent with similar literature findings which found that patients with more than one chronic condition especially the elderly require the use of multiple drug therapies leading to potential medical-related issues like adverse drug reactions, poor adherence, and drug-drug interactions [10, 13, 19, 20]. Therefore, a careful and regular review of patient's medications would be important in population to minimize the risk of polypharmacy [21]. Another factor that might have led to polypharmacy among outpatients with chronic illnesses is that we conducted the study in a public facility where patients receive medications free of charge. Studies have shown that medication cost is a known factor that decreases consumption of medications and is associated with a negative impact on adherence [22]. In addition, participants who were taking over-the-counter drugs had higher odds of polypharmacy. This could be because outpatients who were taking over-the-counter drugs bought from private pharmacy may take them concurrently with the prescribed medicines from the hospital hence at risk of polypharmacy. This is consistent with a study done by Votova and colleagues who found that 20% of Canadian adults had a high probability of using prescribed medications and over-the-counter drugs concurrently [23]. Interestingly, the participants who were taking herbal medicines had lower risk of polypharmacy. Therefore, we postulate the need for further research on the relationship between herbal medicines and polypharmacy since our study has shown some protective relationship.

Our findings emphasize the need for healthcare providers to assess medication prescription regularly and carefully, especially among patients with chronic illnesses. Also, prescription guidelines and disciplines among healthcare workers should be enforced. In addition, there is need to increase public awareness about the danger of the use of over-the-counter drugs without prescription, emphasizing outcomes like medical cost, adverse drug reactions, drug-drug interactions, and drug-food interactions.

Strengths and limitations

The study site receives patients from more than one district hence a good representative of the study population

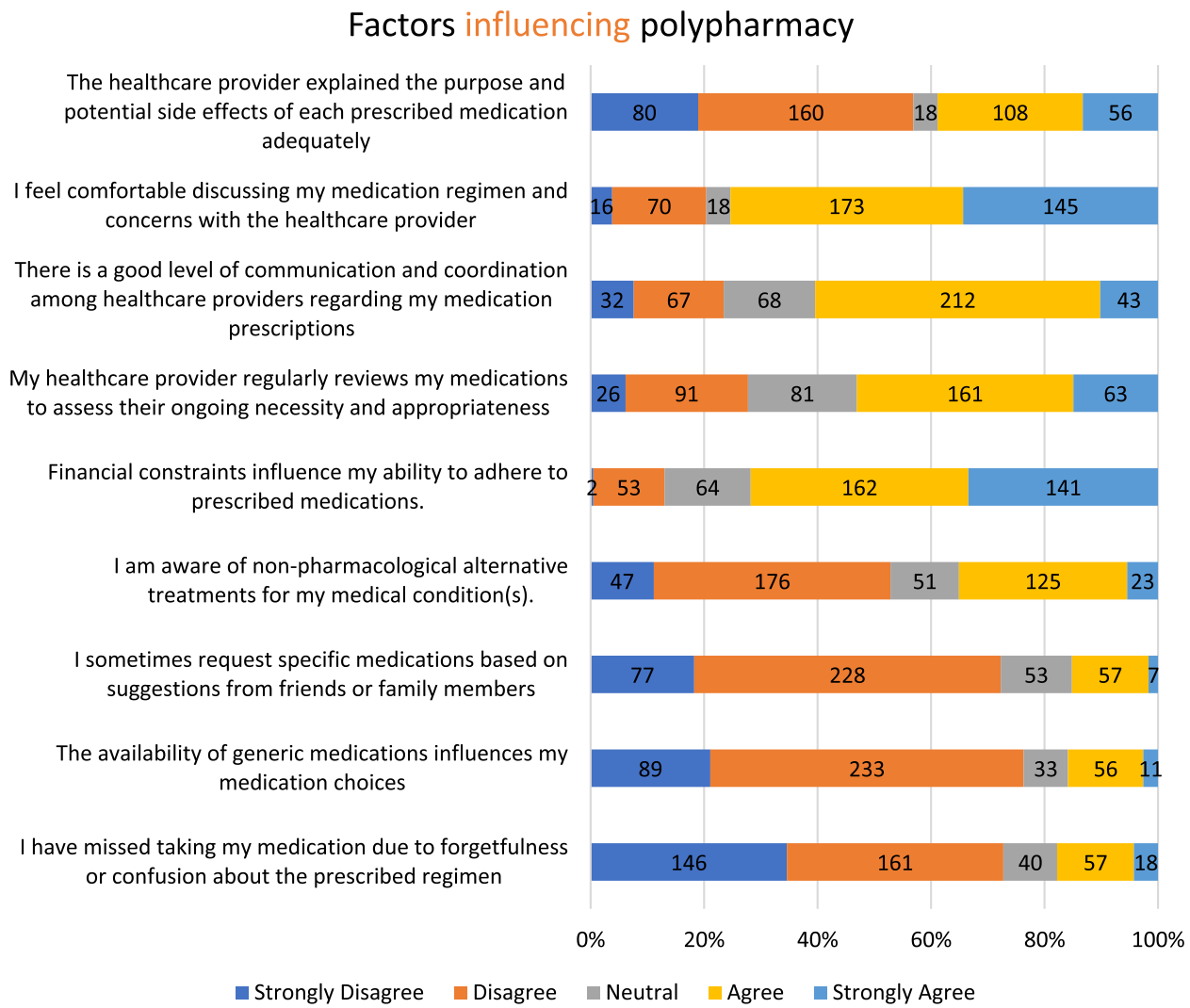

Fig. 3 Participant's scoring regarding medication intake

in both rural and urban settings. Pretesting of questionnaire provided clarity of the questions and increased the response rate. In addition, training of the research assistants provided skills which enabled the research assistants to collect data with the highest skills and ethical standards. Finally, the ample sample size used made it representative of the study population and the response rate of 100% minimized selection bias thus enhancing the generalizability of the research findings. The main limitation of the study lies in its cross-sectional design that restrict the ability to establish causal relationships. Moreover, the study site is a government public facility which may not reflect reality in private not-for-profit and private for-profit facilities in Uganda. Further research in diverse settings and populations is needed to ensure the broader applicability of the study findings. There could be recall bias.

Conclusions

The prevalence of polypharmacy among adult outpatients at Kitgum General Hospital was high. Chronic illness, use of over-the-counter drugs and intake of herbal medicines have a significant impact on polypharmacy among adult outpatients at Kitgum General Hospital, Uganda. Special attention is required to mitigate the apparent high prevalence of polypharmacy among adult outpatients with emphasis on those who have chronic illnesses, using over-the-counter medicines and accompany use of herbal medicines. Prescription guidelines and disciplines among healthcare workers should be enforced and a study on the relationship between herbal medicine and polypharmacy is recommended.

Acknowledgements
We acknowledge the study participants, the administration of Kitgum General Hospital and the Department of Public Health of Gulu University.

Authors' contributions
N.O, D.M and F.B; Conceptualization of the study protocol, N.O, D.M and F.B designed the study, N.O data collection, N.O and R.N did data analysis, N.O, D.M, J.J.L, J.O and F.B wrote the main manuscript. All the authors have revised and approved the submitted version of the manuscript.

Funding
There was no funding toward research study.

Data availability
Data is provided within the manuscript or supplementary information files.

Declarations

Ethics approval and consent to participate
The study protocol was approved by the Gulu University Research Ethics Committee (GUREC reference no: GUREC-2023–592). Administrative clearance from Kitgum General Hospital was obtained. Written informed consent was obtained from all participants. Ethical regulations outlined in the *Declaration of Helsinki* were observed throughout the study. Anonymity was guaranteed during data collection to ensure confidentiality and encourage honest responses. No participant identifiable characteristics beyond basic demographics were collected.

Consent for publication
Not applicable.

Competing interests
The authors declare no competing interests.

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Received: 19 July 2024 Accepted: 30 April 2025
Published online: 08 May 2025

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