

Knowledge And Practices Used By Old Age Patients To Control Polypharmacy

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ABSTRACT

Background: Older people now constitute more than 60% of the world's population. The elderly population suffers from chronic diseases and multimorbidity and is treated with an increasing number of drugs that result in Polypharmacy. Polypharmacy was defined as per a systematic review conducted in 2017 as the concurrent use of five or more different prescription medications. **Aim:** This study aimed to assess the level of knowledge regarding Polypharmacy among older patients and assess the alternative practices used by old-age patients to control Polypharmacy. **Design:** A descriptive cross-sectional study design was used. **Subjects & Setting:** The sample size was 114 elderly patients selected from outpatient clinics monthly. **Tools:** (1) Questionnaire to assess geriatric patient's Polypharmacy's knowledge, (2) Checklist to assess polypharmacy's alternative practices. **Results:** two-thirds of the study sample (66.7%) took medication based on their previous experience. More than half of the study sample (57%) depended on the pharmacist's prescription, and about half of the sample referred to friends' advice.

In comparison, nearly half of the study sample (44.7%) took medication based on the experience of a family member (32.5 %) were aware of the meaning of Polypharmacy. In comparison (23.7%) were aware of the Polypharmacy contributing factors. **Conclusion:** The study concluded that; the prevalence of Polypharmacy and its consequences among the elderly are significantly related to the level of education. **Recommendations:** designing an educational program for the elderly, aiming to increase their awareness and knowledge and maintain a healthy lifestyle; Activating the role of health educators during inpatient discharge and within outpatient services to promote the use of non-drug methods.

Keywords: Polypharmacy, Old age, Adverse drug reactions (ADR), Knowledge & Practices

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Introduction:

The aging of human beings is an increasing phenomenon globally, and the World Health Organization has predicted that the number of older adults, which is limited to sixty-five years - in the world will reach 1.5 billion people. By 2050, the number of older adults currently make up more than 60% of the world's population; Which in turn increases their visits to hospitals, which leads to a multiplicity of their use of medicines, and the elderly in the world suffer from chronic

diseases, a large number of sick cases, and this is treated with an increasing number of medicines, which increases the phenomenon of over-medication (1).

According to the WHO, Polypharmacy is defined as the concurrent use of five or more different prescription medications. Previous studies have provided evidence that the probability of ADRs among geriatric patients is estimated at 6% when two drugs are taken, increases to 50% when five drugs are taken, and becomes 100% when eight or more drugs are taken simultaneously. Polypharmacy has also been documented as a significant risk factor for ADRs in the developed countries. Aging has a substantial impact on the pharmacokinetics and pharmacodynamics, comorbidity, and patterns of medication that may contribute to an increased risk of adverse events (2).

Polypharmacy is usually defined quantitatively as the use of multiple medications, including prescription and over-the-counter drugs, alternative medicine products, and supplements. The number of drugs traditionally used in defining Polypharmacy has been frequently debated and has been steadily increasing. The "cutoff" for classifying Polypharmacy is usually five or more daily medications, and ten or more medications are considered excessive Polypharmacy. Nevertheless, because different diseases co-occur in elderly adults, and treatment guidelines recommend multidrug regimens for common disorders, an innovative approach would be to switch from a quantitative to a qualitative method and define Polypharmacy as the use of inappropriate or superfluous medicines for individuals (3).

The phenomenon of over-medication is increasing in the elderly category, and the side effects associated with these drugs are exacerbated with it. Medicinal over-medication is considered a syndrome of aging. With the development of modern medicine and with the rapid increase in the number of elderly, the phenomenon of over-medication has become a concern of health care providers for the elderly such as doctors, pharmacists, institutes, and medical institutions for the consequences thereof as side effects, increased rates of falls, and non-compliance with the drug regimen (4).

According to a study conducted to track emergency room visits due to adverse drug reactions in elderly patients (65 years or older), results of a study revealed that 37.5% of the visits resulting from adverse reactions ended with hospitalization for treatment, and about 50% of the hospital stays were among patients (5).

Reducing Polypharmacy in elderly populations requires a multi-pronged approach that includes risk identification, explore non-pharmacologic alternatives to drugs, such as dietary changes, determine strategies to minimize medications, and interdisciplinary teamwork. This review draws upon the existing literature to suggest evidence-based strategies to minimize Polypharmacy (6).

Nursing role in controlling Polypharmacy of the elderly: Nurses play a functional role in preventing drug-related problems because they are aware of the dangers of Polypharmacy, responsible for assuring the safe preparation and administration of medications, and monitoring for indications and effects of medications. Nurses are also responsible for implementing nursing-based interventions to improve awareness of old age about Polypharmacy, drug reactions, and safe steps of medication administration to enable old age to adopt healthy practices related to this issue. Therefore, nurses must understand how polypharmacy and pill burden occur and affect patients' health outcomes. In geriatric patients, the liver size decreases with age, and its ability to metabolize drugs also declines, which increases the risk of toxicity (7).

Nurses should be able to recognize problems and report concerns regarding Polypharmacy. To recognize problems, nurses require skills to build close relationships with patients. Nurses play an essential role in maintaining patient's safety and well-being (8).

Nurses can also motivate patients to use modern tools such as dosette boxes, alarm clocks, and reminders. Educate and Motivate Patients To increase compliance: Educational interventions can minimize the incidence of adverse reactions and non-compliance (9).

Significance of the study:

Polypharmacy increases the risk of adverse drug-related events in older people. First, a higher number of drugs is associated with a higher risk of harmful drug-drug interactions; second, the aging process is associated with physiological changes (e.g., weight loss, deterioration of liver and renal excretion, and decreased cardiac output and body composition remodeling (10).

Polypharmacy increases emergency visits for older patients by 67% and increases hospitalization by 40.6 %. Another study conducted in Sweden reported that those taking five or more medications had a 6.2% increase in prescription drug expenditure. Those taking ten or more medications had a 7.3% increase in (11).

Therefore, the study aimed to assess the knowledge and alternative practices used to control Polypharmacy among old patients.

Aim of the study:

- Assess the level of knowledge regarding Polypharmacy among older patients.
- Assess the safe alternative practices used by older patients to control Polypharmacy.

Research Questions:

In order to address the study purpose, the following study question was formulated:

- What is the level of old age patient's knowledge with regards to Polypharmacy?
- What are the alternative practices used by old age patients to control Polypharmacy?

Subjects and design

Research design:

A descriptive cross-sectional study design was used in order to answer the research questions.

Setting:

The current study was conducted in Beni-Suef university hospital in the OPD clinics caring for old age patients.

Sample:

The sample size was 114 elderly patients from an estimated total of 2500 elderly patients visiting OPD clinics monthly in the pre-determined setting has been calculated by using the following equation.

$n = [DEFF * Np(1-p)] / [(d2/Z21-\alpha/2*(N-1) + p*(1-p)]$ and using Confidence Level 95%.

Tools:

Two tools of data collection were utilized to full fill the study aims as follows:

Tool I: Questionnaire to assess geriatric

patient's polypharmacy knowledge consists of two parts:

- **Part1-Demographic** data: to assess the old age patient's demographics ex (age, gender, level of education, current comorbidities, etc.
- **Part2-Questionnaire** to assess the old age patient's knowledge related to Polypharmacy.

Tool II- Checklist to assess poly pharmacy's alternative practices: To assess the safe alternative practices used by old age patients in order to control Polypharmacy.

Tool's validity:

Tool validity test was done through five expertise (Faculty members of Community Health Nursing Department at Cairo and Beni-Suef University).

Reliability:

The tool's accuracy was based on Cronbach's ALPHA. The Cronbach's alpha for the reliability was 0.88 (between 0.80 -0.89 denotes a good reliability level)

Pilot study:

A pilot study was carried out on 12 patients that meet the study's criteria to test the content of the questionnaire and checklist and estimate the time needed for data collection, and the necessary modifications will be done. Those who participated in the pilot study were excluded from the study sample.

Results:

Table (1): described the distribution of the study sample according to their knowledge about Polypharmacy. The data showed that nearly half of the study sample (41.2%) were unaware of polypharmacy definition; more than a third of the study sample (36.8%) did not know about Polypharmacy contributing factors. More than one-third of the study sample (38.5%) did not know the people at risk. Less than a third of the sample (28.9%) could not identify the impact of Polypharmacy on physical function. More than a third of the study sample (38.5%) were not aware of GIT side effects related to Polypharmacy. More than a third of the study sample (35.9%) were

not aware of the polypharmacy impact on cognitive function, and less than one-third of the study sample (29.8%) did not know the measures to reduce Polypharmacy.

Table (1): Distribution of the study sample in relation to their knowledge about Poly-pharmacy (114).

Knowledge about Poly-pharmacy	Complete answer		Incomplete answer		Do not know	
	N	%	N	%	N	%
Definition	37	32.5	30	26.3	47	41.2
Contributing factors	27	23.7	45	39.4	42	36.8
People at risk	40	35.1	30	26.3	44	38.5
Impact on physical function	40	35.1	41	35.9	33	28.9
Side effects related GIT	35	30.7	35	30.7	44	38.5
Impact on cognitive function	29	25.4	44	38.5	41	35.9
Measures to reduce Poly-pharmacy	31	27.2	49	42.98	34	29.8

Table (2): Distribution of the study sample according to their self-reported practice to reduce Poly-pharmacy (114).

Self-reported practice to reduce polypharmacy	Done		Not done	
	N	%	N	%
Check up and follow up with the same Doctors	35	30.7	79	69.2
Use the same pharmacy	44	38.5	70	61.4
Review your medication with your Physician	33	28.9	81	71
Read labels	23	20.2	91	79.8
Ask about the correct dose and route	70	61.4	44	38.5
Do not share or borrow medication	50	43.8	64	56.1
Adherence to immunization system for old age	25	21.9	89	78
Follow infection control measures	30	26.3	84	73.6
Follow non-pharmacological measures to reduce pain	27	23.6	87	76.3
Follow non-pharmacological measures to reduce constipation	47	41.2	67	58.7
Practicing exercise	29	25.4	85	74.5

Table (2): clarified the distribution of the study sample according to self-reported practice to reduce Polypharmacy. The data revealed that the majority of the study sample was not reading the labels of the medications nor adhering to the immunization system of the old age (79.8%) and (78%) respectively. Almost three-quarters of the study sample (74.5%) were not practicing exercise, while two-thirds of the study samples (61.4%) were asking about the right dose and right route. More than half of the study sample were either sharing or borrowing medications and Follow non-pharmacological measures to reduce constipation (56.1%) and (58.7%) respectively. More than one-third of the study sample (38.5%) were not asking about the right dose and right route.

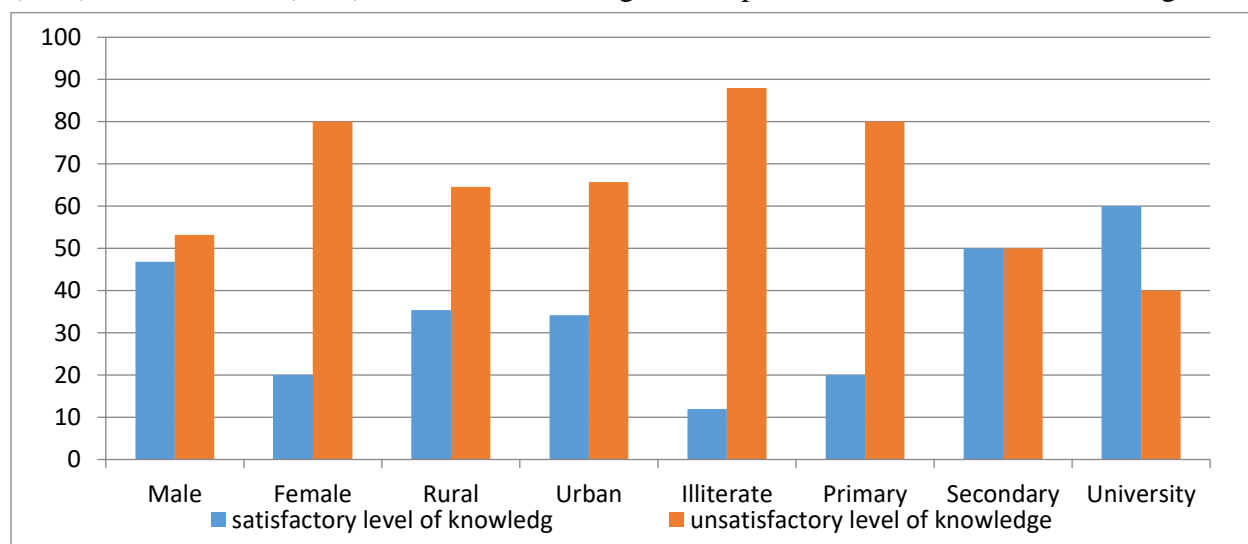
Less than a quarter of the Study sample was Following non-pharmacological measures to reduce pain and read the medications' labels (23.6%) and (20.2%) respectively.

Table (3): Relationship between demographic characteristics of the study sample and their total level of knowledge (114).

Demographic characteristics	Satisfactory (40)		Unsatisfactory (74)		X2	P
	N	%	N	%		
Gender (n)						
Male (64)	30	46.8	34	53.2	8.9	.002*
Female (50)	10	20	40	80		
Residence						
Rural (79)	28	35.4	51	64.6	0.01	.9
Urban (35)	12	34.2	23	65.7		
Education						
Illiterate (25)	3	12	22	88	17.2	.0006*
Primary (30)	6	20	24	80		
Secondary (44)	22	50	22	50		
University (15)	9	60	6	40		

(*) statistically significant at p <0.05

Table (3): described the Demographic characteristics of the study sample in relation to their total level of knowledge. The data indicate that male patients had a significantly more satisfactory level of knowledge than females' satisfactory level (46.8%) and (20%), respectively. Residence in rural or urban areas was not associated with the level of knowledge. Education was a significant predictor of the level of knowledge. University education was the highest Percentage of a satisfactory level of knowledge (60%) followed by secondary education (50%), then primary (30%), then illiterate (12%). Education was a significant predictor of the level of knowledge.



Figure(1): Relationship between demographic characteristics of the study sample and their total level of knowledge.

Figure (1): showed that the highest satisfactory level of knowledge was for the university education (60%) followed by the secondary level of education (50%) and finally in the third level were the male patients (46.8%). On the other hand, the highest unsatisfactory level of knowledge was from the illiterate patients (88%), followed by both the primary level of education (80%) and female patients (80%) (at the same level)

Table (4): Relationship between demographic characteristics of the study sample and their total level of practice (N=114)

Items	Satisfactory (48)		Unsatisfactory (66)		X2	P
	N	%	N	%		
Gender (n)						
Male (64)	20	31.2	44	68.8	7.1	.007
Female (50)	28	56	22	44		
Residence						
Rural (79)	27	34.1	52	65.9	3.9	.004
Urban (35)	21	60	14	40		
Education						
Illiterate (25)	5	20	20	80	18.2	.0003
Primary (30)	7	23.3	23	76.6		
Secondary (44)	26	59.1	18	40.9		
University (15)	10	66.6	5	33.4		

Table (4): clarified the demographic characteristics of the study sample in relation to their total level of practice. Data showed that female patients significantly had a more satisfactory level of practice than males (56%) and (31.2%), respectively. While residents of urban areas significantly had a more satisfactory level of practice than residents of rural areas (60%) and (34.1%) respectively. Finally, education was a significant predictor of the level of practice as university education was associated with the highest Percentage of a satisfactory level of practice (66.6%), followed by secondary education (59.1%), then primary (23.3%), then illiterate (20%). The residence was a significant predictor of the level of practice.

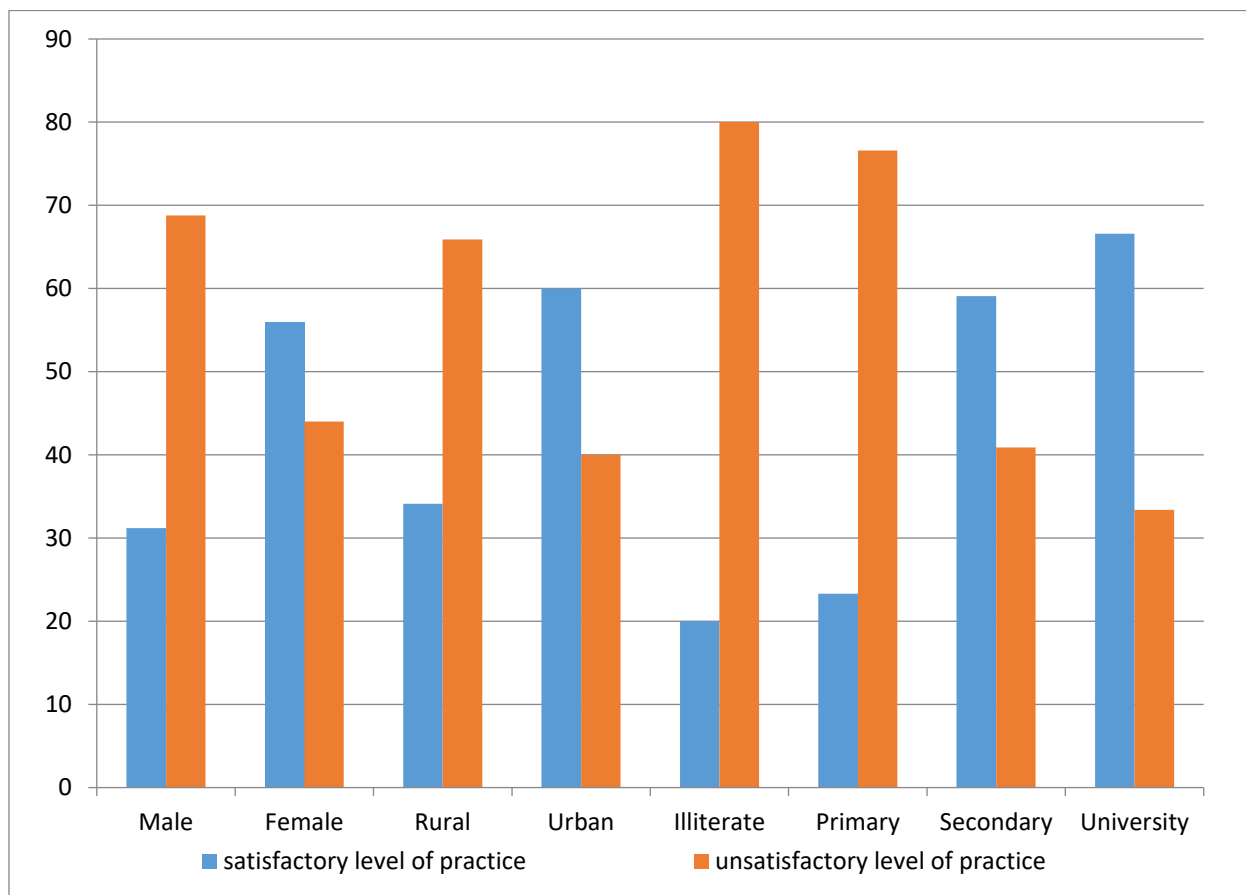


Figure (2 Relationship between demographic characteristics of the study sample and their total level of practice

Figure (2): showed that the highest satisfactory level of practice was for the university education (66.6%), followed by the urban area residents (60%). Finally, in the third level were the secondary level of education (59.1%); on the other hand, the highest unsatisfactory level of practice was from the illiterate patients (80%), followed by both the primary level of education (76.6%) and finally, in the third level were the male patients (68.8%).

Discussion:

Polypharmacy increases the risk of adverse drug-related events in old age because a higher number of drugs comes with a higher risk of harmful drug-drug interactions, also the aging process is associated with physiological changes (e.g., weight loss, deterioration of liver and renal excretion, decrease of cardiac output and body composition remodeling) (10). Polypharmacy increases emergency visits for old age patients by (67%) and increases hospitalization by (40.6%). Another study conducted in Sweden reported that those taking five or more medications had a (6.2%) increase in prescription drug expenditure, and those taking ten or more medications had a (7.3%) increase (11). Therefore, the study aims to assess the knowledge and the used alternative practices to control Polypharmacy among old age patients.

The current study revealed that more than two-thirds of the study sample either had an incomplete understanding or even did not mean at all of the meaning of Polypharmacy and near to three-quarters of the subjects were either partially aware or unaware of the contributing factors for Polypharmacy; this might be due to relatively low level of education of the study sample, in the same regard these findings were supported by **Galazzi A., et al., (2016)** as his study results showed that less than quarter of the studied sample who had Polypharmacy reported that they do not feel they were taking a large number of medications while less than half of the subjects were understanding the reason for having many medications, in agreement with these results **Priya N., (2019)** revealed that half of the study sample does not know the use of medication, while the majority of the study sample did not know the clinical purpose of the medicine they were using.

In addition to the awareness about the consequences of Polypharmacy on the elderly, the current study showed that almost two-thirds of the study subjects were either partially or unaware of Polypharmacy's impacts on their physical functions. More than two-thirds were either partially or totally unaware of the GIT consequences, and this might be due lack of health education on the given medications; supporting these findings **Crofford L.J., (2020)** found that less than one-quarter of the studied sample of elderly patients were aware of the side effects of the medications they were taking.

Regarding self-reported practice that may reduce Polypharmacy, the current study demonstrated that more than two-thirds of the study sample was not following up regularly with the same physician; from the researcher point of view, this may be due to physical or financial obstacles to follow up with the same physician and also if the patients experienced unpleasant side effects or did not see any immediate benefit from the therapy they may change the physician, in the same regard **Shaheen H. et al., (2017)** showed similar Percentage that was more than third of the studied sample was doing regular follow-ups to review their medications.

The present study's findings showed that more than two-thirds of the studied subjects were not reading the labels of their medications before taking them; this might be related to the educational level of the studied sample and the setting of the study. On the opposite side **Manchanayake M.G., et al. (2018)** found that less than half of his studied sample was reading the labels of their medications.

The current study revealed that more than three-quarters of the studied subjects were not adhering to the mandatory vaccination program of the old age population; this might be due to the relatively low educational and awareness level in the rural areas, on the other hand, **Manchanayake M.G. et al., (2018)** conducted a study in Denmark. The results show that less than half of his study subjects supported the mandatory vaccination of practice personnel with direct patient contact.

Concerning the use of non-pharmacological therapies to control pain and constipation, the current study showed that more than three quarters and more than half of the study subjects were not following the alternative non-pharmacological measures to reduce Polypharmacy; this might

be justified by the prevalent belief of the higher efficacy of the pharmacological than the non-pharmacological therapies. On the other hand, **K Suleiman A. (2013)** conducted a study in Saudi Arabia about the belief of using herbal remedies in between (non-pharmacological), and the results show that more than three-quarters of the studied sample strongly believed in these non-pharmacological measures as an alternative to medications.

In relation to demographic characteristics of the study sample in relation to the total level of knowledge related to Polypharmacy, the current study demonstrated that male patients had a significantly more satisfactory level of knowledge related to Polypharmacy than female subjects, the variable involvements might explain this, and exposures of male patients which expand their knowledge during working outside the native community to get the needed life expenses, on the other hand, a study conducted by **Bosch-Lenders, D., et al . (2016)** showed that females had more significantly higher level of knowledge which might be explained by the higher perception of risk and more compliance among females.

With regarding the level of education and its significance on polypharmacy awareness, the current study showed that education was a significant predictor of the level of knowledge about Polypharmacy; this might be due to the vital role of educational level in enriching the patient's awareness about their medications through reading pamphlets and seeking more information from the treating physician or pharmacist. In the same line with these results, the results **Abdelwahed A.Y., et al. (2018)** found that education was a significant predictor in reducing Polypharmacy.

Concerning the demographic characteristics of the study sample in relation to their total level of practice, the current study showed that female patients were significantly having a more satisfactory level of practice compared to males. The higher commitment of the females might explain this in following the healthy lifestyle and controlling the Polypharmacy supporting the current study results **Martinez-Gomez D., et al., (2018)** who found that female subjects in his study were having a more satisfactory level of healthy lifestyle practices compared to males' subjects.

With regards to the level of education and its relation with the total level of practices that reduce Polypharmacy, the findings of the current study revealed that education was a significant predictor of a satisfactory level of practice; this might indicate the higher level of education the subjects have, the more compliance to practices that control Polypharmacy, in agreement with the current study findings **Martinez-Gomez D., et al., (2018)** found in his study that the higher level of subject's education was significantly associated with a more favorable level of leading healthy lifestyle practices that would reduce Polypharmacy.

Conclusion:

The current study concluded that the prevalence of Polypharmacy and its consequences among the elderly is significantly consequent to the level of education; University education was the highest Percentage of a satisfactory level of knowledge about Polypharmacy and the highest satisfactory adherence to the safe alternative practices that control Polypharmacy, followed by

secondary education then primary then illiterate. The majority of the study sample had an average to low level of education, which made them more liable to Polypharmacy and its consequences.

Recommendations:

In the light of the results of this study, the following recommendations were suggested:

- Designing an educational program tailored for the older adults aiming at raising their awareness and knowledge about the consequences of Polypharmacy and the safe practices that the old age people should follow to control Polypharmacy.
- Activating the role of patient family educators while inpatients discharge and within ambulatory care service to enhance the use of non-pharmacological interventions and safe medication administration for the elderly and caregivers.
- Further studies should be conducted in different settings.

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Data Availability: The authors confirm that all data underlying the findings are fully available without restriction. All relevant data are within the paper and its Supporting Information files.

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