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Polypharmacy usage among elderly population attending at primary health care centers in Buraidah city, Saudi Arabia 2020

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ABSTRACT

Background: Saudi Arabia has a large proportion of elderly population related with multiple continual illnesses who need increase Interest and tracking for their medicinal drugs. *Objectives:* Assessing the prevalence and utilization of medicines for elderly population and the way to provide better health-care management. *Methods:* A cross-section study between December 2019 to December 2020 on PHCC in Buraidah above age of 60 years and taking 5 or more medication individuals visiting to the Primary Health Care Centre by Questionnaire form to assess polypharmacy usage. Necessary statistical tests were applied. *Results:* Polypharmacy (PP) was 57% among elderly subjects who were using 5 drugs or more. Males, lower educational level and suffering from 2 or more chronic diseases have been notably associated with increased levels of PP. Most of the subjects had good knowledge regarding the drugs. *Conclusion:* High prevalence of poly pharmacy among geriatric patients was associated to severity of multiple diseases, patient's older age and male gender. Health promotional measures to reduce chronic diseases incidence in the population is required.

Keywords: Polypharmacy, elderly, primary healthcare centers, Saudi Arabia

1. BACKGROUND

The biggest challenges defiance health systems universally in the 21st century are the high prevalence of non-communicable disease (Bellosta and Corsini, 2018). The elderly population with many non-communicable diseases has led to a raising prescription of medications (Hukins et al., 2019; Majnarić et al., 2020; Mikelyte et al., 2020). As a result, the use of couple drug or polypharmacy (PP) has become common. Often termed "polypharmacy" is commonly defined as using 5 or more prescription medication. This polypharmacy is sometimes needful, but may be related with a high rate of adverse outcomes (Bushardt et al., 2008; Agarwal & Agarwal, 2020; Alshammari et al., 2021). Elderly population are more susceptible to get many

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non-communicable diseases than younger population; so, they need more drugs. Polypharmacy is confirmed to be a risk aspect due to more side outcomes, drug–drug interactions, non-adherence, financial costs, and morbidity outcomes. Saudi Arabia has a large proportion of elderly population suffering from multiple non-communicable diseases; need increase attention and monitoring for their drugs. The life expectancy in Saudi Arabia has progressed from 64.4 years in the 1980s to 74.3 years in the 2000s (World Bank, 2014) (World Bank World Databank, 2014). Based on above statement, by the year 2035, the aged populace aged 60 years old and above will be projected to growth to 18.4% (Khoja et al., 2018).

A study done on 766 patients was found that the increasing cases of polypharmacy were observed in medical outpatients at the tertiary care center (Salih et al., 2013). This study aimed at assessing the rate of polypharmacy usage among the elderly geriatric population and the attitude of the patients.

2. METHODS

Study design and sample

A cross-sectional study was conducted from December 2019 to December 2020.

Study population and sample size

Patient Age above 60 years population and taking 5 or more medication attending at health care center of Buraidah city.

Sampling

WHO, Statistical package were used for sample size calculation and for the estimation of the sample size. Based on prevalence assumption was 50%, 95% confidence interval and absolute precision was 6% and sample estimate was 267. Initially 5 primary health care centers were selected randomly from all primary health care centers available in the Buraidah city. For recruiting the sample, at Primary health care centers, above age of 60 years old and taking 5 or more medication individuals visiting to the Primary Health Care Centre were included. Every alternative patient was included in the present study till the completion of sample.

Study tools and data collection

The study is based on a questionnaire sheet that was developed after studying the search engines including Science Direct, Scopus, Pubmed etc. The questionnaire was translated to Arabic language and pre-tested in a pilot study on 20 subjects to ensure the clarity of the questions then reviewed and validated by 3 experts then the data were collected.

Ethical approval

Before conduct of the research, informed consent was taken from each and every participant. Institutional ethical certificate was obtained from local regional research ethics committee, Al-Qassim Province. Privacy and confidentiality of the patient information was maintained.

Statistical analysis

All the data collected and entered and analysis was done by using the SPSS. Descriptive statistics like mean and standard deviation for continuous variables done. For categorical variables, chi square test and Fisher exact test were applied. Statistical significance was considered as the probability (P) value less than or equal to 0.05 in the present study.

3. RESULTS

Demographics of the studied subjects

Table (1) shows distribution of the studied group regarding basic characteristics. The patients aged 60-70 were 48.6% and from 70-80 years were 48.3%. The majority of respondents (71.9%) were males and 28.1% were females. About 81.8% of subjects had attended high school representing the majority of subjects followed by 13.2% had attended college. The occupation status was divided into 2 sections with 20% were still working and the rest were retired. The majority were married (92.7%).

Table 1 demographic characteristic of study subjects

	N	%
Age		
60-70	187	48.6
70-80	186	48.3
>80	12	3.1
Gender		
Male	277	71.9
Female	108	28.1
Education Level		
Illiterate	19	4.9
School level	315	81.8
College or higher	51	13.2
Occupation		
Still working.	79	20.5
Retired	306	79.5
Socioeconomic status		
<3000	83	21.6
3000-5000	109	28.3
5000 – 10000	111	28.8
10000 - 15000	46	11.9
15000 - 20000	26	6.8
>20000	10	2.6
Marital status		
Single	3	0.8
Married	357	92.7
Divorced	10	2.6
Widower	15	3.9

Knowledge regarding polypharmacy

About 99.2% and 99.7% of subjects were taking medications continuously and suffering from chronic diseases, respectively. The number of polypharmacy usage were 2 among 12%, 3 among 16.2%, 4 among 11.8%, 5 among 18.3%, 6 among 18.6%, 7 among 10.2% and 8 among 6% of subjects. Most of the subjects suffered from diabetes mellitus (80%), hypertension (60.3%) followed by Osteoarthritis (OA)(29.4%), dyslipidemia (19%) and heart diseases among 16.4% of subjects. The majority of subjects were using the drugs for more than 15 years old (38.4%), followed by 31.4% from 10-15 years and 23.4% from 5-10 years.

Table 2 Polypharmacy status among participants

	N	%
Did you take any medication continuously		
Yes	382	99.2
No	3	0.8
If yes, How many medications you take?		
1	11	2.9

2	46	12.0
3	62	16.2
4	45	11.8
5	70	18.3
6	71	18.6
7	39	10.2
8	23	6.0
9	11	2.9
10	2	0.5
11	2	0.5
Are you suffering from any chronic disease?		
Yes	384	99.7
No	1	0.3
Type of disease		
DM	308	80.0
HTN	232	60.3
OA	113	29.4
ASTHMA	3	0.8
HEART DISEASE.	63	16.4
Dislipidaemia	73	19.0
Since how long you are using this drug?		
< 2 year	3	0.8
2 - 5 year	23	6.0
5-10 year	90	23.4
10-15 year	121	31.4
>15year	148	38.4

Polypharmacy Utilization of the subjects

Table 3 depicted that all the subjects believed that they got benefit from their medications. The overall knowledge about the medications used was found adequate among 82.9% of subjects (Table 3, Fig. 1).

Table 3 polypharmacy utilization and knowledge

	N	%
Do you think that you get benefit from this medication?		
Yes	385	100.0
No	0	0.0
Did you have enough knowledge about your medication?		
Yes	319	82.9
No	66	17.1

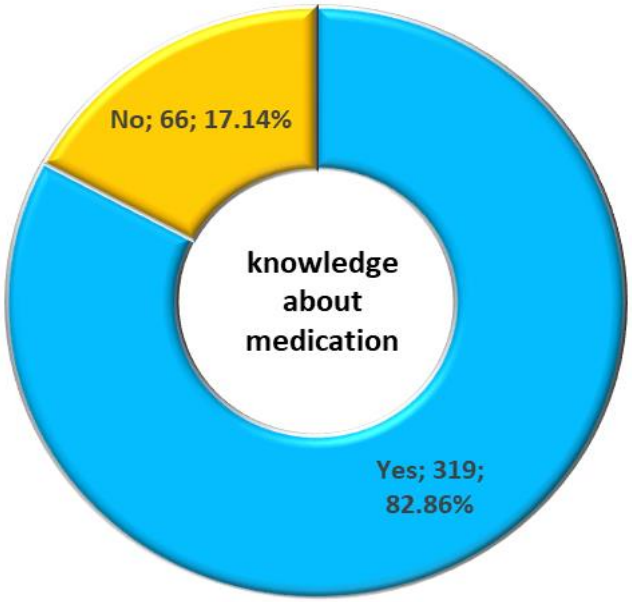

Figure 1 knowledge about used medications

The relation between the demographics with the attitude of included subjects

As presented in table 4 and figure 2, the level of knowledge about their medicines were significantly associated with age, higher educational level and retired subjects.

Table 4 Relation between different studied basic demographic data and knowledge

		Did you have enough knowledge about your medication?						Chi-square	
		Yes		No		Total			
		N	%	N	%	N	%	X^2	P-value
Age	60-70	172	53.9%	15	22.7%	187	48.6%	24.899	<0.001*
	70-80	136	42.6%	50	75.8%	186	48.3%		
	>80	11	3.4%	1	1.5%	12	3.1%		
Gender	Male	232	72.7%	45	68.2%	277	71.9%	0.549	0.459
	Female	87	27.3%	21	31.8%	108	28.1%		
Education Level	Illiterate	15	4.7%	4	6.1%	19	4.9%	20.753	<0.001*
	School level	253	79.3%	62	93.9%	315	81.8%		
	College or higher	51	16.0%	0	0.0%	51	13.2%		
Occupation	Still working.	75	23.5%	4	6.1%	79	20.5%	12.661	<0.001*
	Retired	244	76.5%	62	93.9%	306	79.5%		
Socioeconomic status	<3000	57	17.9%	26	39.4%	83	21.6%	35.552	<0.001*
	3000-5000	84	26.3%	25	37.9%	109	28.3%		
	5000 – 10000	98	30.7%	13	19.7%	111	28.8%		
	10000 - 15000	44	13.8%	2	3.0%	46	11.9%		
	15000 - 20000	26	8.2%	0	0.0%	26	6.8%		
	>20000	10	3.1%	0	0.0%	10	2.6%		
Marital status	Single	3	0.9%	0	0.0%	3	0.8%	7.985	0.046*
	Married	300	94.0%	57	86.4%	357	92.7%		
	Divorced	5	1.6%	5	7.6%	10	2.6%		
	Widower	11	3.4%	4	6.1%	15	3.9%		

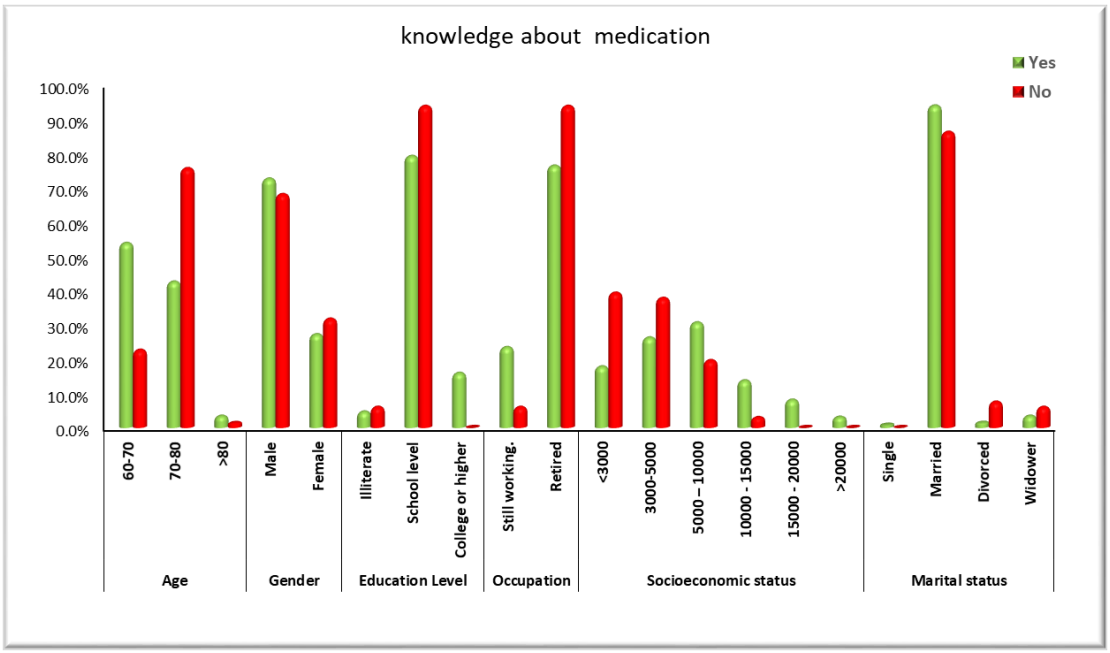

Figure 2 Relation between different studied basic demographic data and knowledge

Table 5 revealed that the prevalence of DM was associated with older age, and retired subjects. Hypertension was significantly associated with male gender, while osteoarthritis and heart disease were associated with female gender. As presented in figure 3 there has been a sizable relation between male gender, lower educational levels and higher usage of PP. Also, figure 4 showed the relation between clusters of chronic diseases with high levels of PP.

Table 5 Association between demographic characteristics and prevalence of chronic diseases

		Age			P-value	Gender		P-value	Education Level			P-value	Occupation		P-value
		60-70	70-80	>80		Male	Female		Illiterate	School level	College or higher		Still working.	Retired	
DM	N	138	158	12	0.002*	223	85	0.693	16	253	39	0.732	55	253	0.009*
	%	73.8%	84.9%	100.0%		80.5%	78.7%		84.2%	80.3%	76.5%		69.6%	82.7%	
HTN	N	114	110	8	0.841	176	56	0.036*	16	187	29	0.063	48	184	0.513
	%	61.0%	59.1%	66.7%		63.5%	51.9%		84.2%	59.4%	56.9%		60.8%	60.1%	
OA	N	45	64	4	0.085	71	42	0.011*	6	99	8	0.05*	20	93	0.230
	%	24.1%	34.4%	33.3%		25.6%	38.9%		31.6%	31.4%	15.7%		25.3%	30.4%	
ASTHMA	N	3	0	0	0.113	3	0	0.159	0	2	1	0.596	1	2	0.499
	%	1.6%	0.0%	0.0%		1.1%	0.0%		0.0%	0.6%	2.0%		1.3%	0.7%	
HEART DISEASE.	N	25	37	1	0.168	30	33	0.000*	3	57	3	0.05*	9	54	0.119
	%	13.4%	19.9%	8.3%		10.8%	30.6%		15.8%	18.1%	5.9%		11.4%	17.6%	
Dyslipidemia	N	28	44	1	0.060	48	25	0.197	3	67	3	0.014*	10	63	0.071
	%	15.0%	23.7%	8.3%		17.3%	23.1%		15.8%	21.3%	5.9%		12.7%	20.6%	

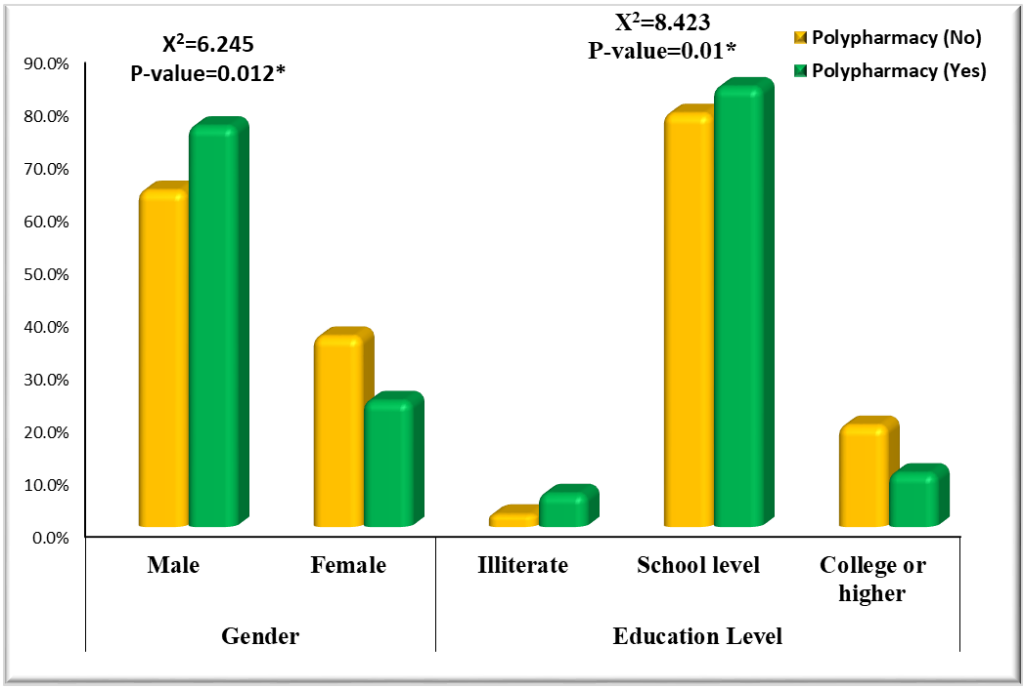

Figure 3 Association between gender, educational level and PP usage

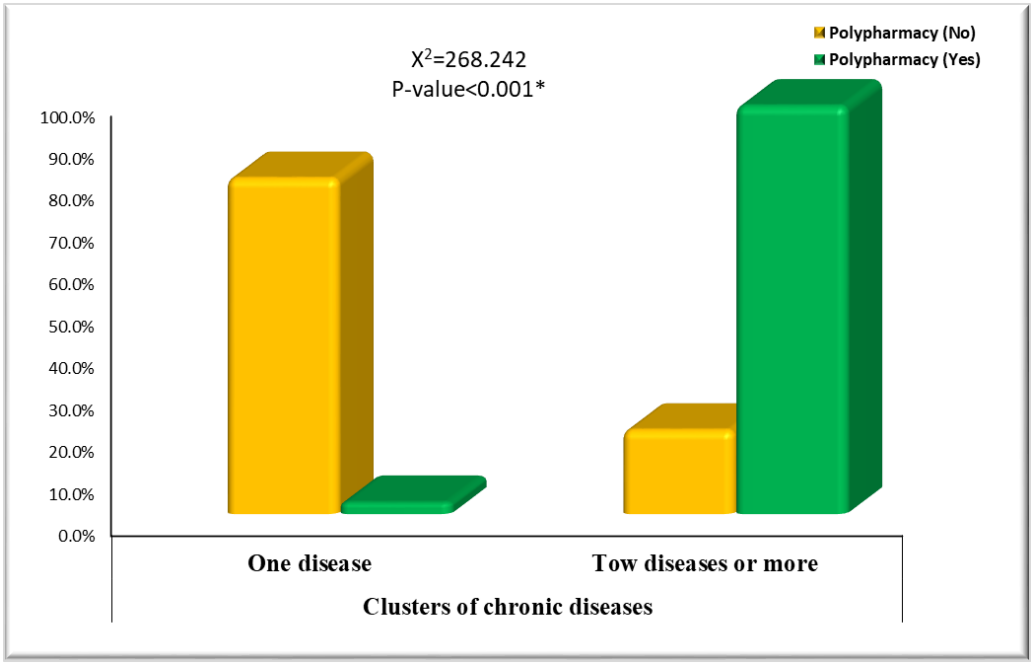

Figure 4 Association between chronic diseases clusters and PP usage

4. DISCUSSION

Medication usage among the elderly is a public health issue, as the elderly people are much more likely to use many drugs that condition known as "polypharmacy" (Lapi et al., 2009). Even though continuous use of 5–6 or more medicines is a commonly used operational term (Jyrkkä et al., 2009; O'Dwyer et al., 2016; Park et al., 2016; Walckiers et al., 2015), polypharmacy is not routinely described in literature. Polypharmacy has a well-established substantial connection with unfavourable clinical outcomes, according to a comprehensive study published in 2013 (Maher et al., 2014). Polypharmacy has also been linked to an tendency to increase the hazard of detrimental drug reactions and interactions as well as inappropriate dosing (Bellosta and Corsini, 2018; Fastbom and Johnell, 2015).

In this study, PP was reported that 57% of elderly subjects were using 5 drugs or more. The prevalence was higher than other studies conducted worldwide as it was 46% among Italians over 65 years (Nobili et al., 2011), and 47% in Norway (Viktil et al., 2007), while Sweden showed the same percentage as our present study (Haider et al., 2009). In the present study, our results were lower than the incidence of PP in a Saudi study conducted on outpatients at a tertiary care center in Riyadh (Salih & Yousuf, 2013). The increased rate of PP seen in this study could be due to the study conducted at a tertiary care facility, in which the majority of patients are admitted due to severe illnesses or multiple comorbidities. It also might be due to the Saudi health care facilities supply the patient with all medications free of charge which is different from other countries where patients are frequently required to purchase pharmaceuticals or pay a prescription fee per drug. Also, most of the patients suffering from chronic diseases may necessitate the usage of multiple drugs.

Males were shown to be significantly susceptible to polypharmacy. There was a favourable link between male species and polypharmacy consumption in studies (Chan et al., 2009; Salih & Yousuf, 2013). In contrast, several studies have shown a association between polypharmacy and females (Bierman et al., 2007; Nobili & Franchi, 2011). Such disparities in research results might be attributed to variances in physicians' prescribing attitudes toward men and women, along with variations in socio - economic and educational factors between men and women (Bierman & Pugh, 2007). There was a need for more studies are required to build the relationship between gender and polypharmacy. Additionally, lower educational level and suffering from 2 or more chronic diseases were significantly associated with increased levels of PP.

Most of the subjects revealed that they have good knowledge regarding the drugs usage, which could be attributed to the long-term usage of these drugs as most of them were using the drugs for more than 5 years. Furthermore, the higher levels of knowledge were associated with elders from 60-70 years old, retired subjects and higher educational levels from which we could conclude that the subject's demographics are predictors for PP prevalence among elders (Joung et al., 2019; Kim et al., 2014). Correspondingly, earlier studies showed that above mentioned factors were risk factors for PP (Gokce Kutsal et al., 2009; Haider & Johnell, 2009). This is not surprising, given that growing older has been related to higher illness load and PP (Veehof et al., 2000). Moreover, many illnesses that affect the elderly are chronic conditions which increase with growing age resulting in increasing the PP (Slabaugh et al., 2010). A study of 65-year-old individuals admitted to hospitals showed that PP is linked to a cluster of DLP, HTN, and DM (Nobili et al., 2011). Also, statically significant relation was found between PP and the number of clustering diseases (Salih & Yousuf, 2013).

The limitations of this study are it is a self-reported study based on the respond of the subjects without clinical screening. The study did not evaluate the ratio of patient's real knowledge about their drugs.

5. CONCLUSION

There was a very high prevalence of PP among geriatric patients which was linked to the patient's older age, male gender and the severity of the multiple illnesses. In Saudi Arabia, the influence of PP on medication adherence and control of underlying disorders is unclear, and it needs to be investigated at different levels of treatment and similar studies are required to support the present study findings.

Institutional Review Board (IRB) Statement

IRB approval was taken from regional Research Ethics Committee; Qassim with ethical approval number is 1443-1233650.

Informed Consent Statement

Consent was taken from all the participants and explained the purpose of the study.

Author Contributions

Principal Investigator: Research idea, review of literature, tool development, data collection and manuscript writing.
Research Supervisor: Involved in all stages of development of manuscript preparation.

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Conflicts of interest

The authors declare that there are no conflicts of interests.

Data and materials availability

All data associated with this study are present in the paper.

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