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RESEARCH ARTICLE

Pharmaceutical advertising and the consumption of over the counter (OTC) medicines in users of the SUPERFAR drugstore in Barrios Altos-Cercado de Lima, 2022. [version 1; peer review: 2 not approved]

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Abstract

Background: To determine the relationship between pharmaceutical advertising and the consumption of over-the-counter (OTC) medicines in users of the SUPERFAR drugstore in Barrios Altos-Cercado de Lima, 2022.

Methods: The methodology used was a quantitative approach, non-experimental, cross-sectional, descriptive-correlational design. The sample consisted of 269 users, who were administered a questionnaire with 20 questions; the technique used was the survey. The results were obtained using SPSS Version 22 and Spearman's correlation statistical test with a significance level of 5%.

Results: The correlation for the general hypothesis was determined with a P value of 0.000 and a Spearman's Rho value of r=0.729 indicating a strong and direct correlation between Variable 1 pharmaceutical advertising and Variable 2 consumption of over-the-counter (OTC) drugs. For the pharmaceutical advertising message dimension, a P value of 0.000 was obtained, Spearman's Rho value of r=0.597 indicating a moderate and direct correlation, for the mass media dimension (P value is 0.000), Spearman's Rho value of r=0.525 indicating a moderate and direct correlation, for the pharmaceutical product promotion dimension (P value 0.000) Spearman's Rho value of r=0.637 showing a moderate and direct correlation and for the

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dimension of excessive consumption of medicines under the influence and responsibility of the pharmaceutical industry (P value 0.000) was obtained. Spearman's Rho value of r=0.670 indicating a moderate and direct correlation.

Conclusion: The conclusion is that there is a significant relationship between the variables pharmaceutical advertising and drug consumption.

Keywords
Pharmaceutical advertising, pharmacy, medicines, drugs, over-the-counter, OTC, consumer

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Introduction

There seems to be a problem with pharmaceutical advertising and the consumption of over-the-counter (OTC) medicines, which supposedly present alternatives for the prevention and/or cure of mild or moderate illnesses. The bad habits of the users of the SUPERFAR drugstore, Barrios Altos-Cercado de Lima, could be harming them when consuming these medicines, all this because of misleading and exaggerated pharmaceutical advertising, with little information about the adverse reactions that they could cause. Self-medication as a form of self-care would have consequences on the health of these people that would be evidenced by the masking of diseases, aggravation of diseases (renal, hepatic, gastric, others), increased expenses at the time of acquiring these advertising products.

Looking to other countries, Castro (2016) says that in Ecuador in the area of Quito Norte, pharmaceutical advertising affects the practice of self-medication of people because, through media, such as television, print media and even the internet, messages about the advantages and benefits of pharmaceuticals are disseminated and that makes people obtain pharmaceutical products quickly and without attending a consultation with a healthcare professional.[1] On the other hand, Viña and Debesa (2017) tell us that in Havana Cuba, thanks to the intervention of the Ministry of Public Health (Minsap) and the Center for State Control of Medicines, Equipment and Medical Devices, the promotion of medicines is well regulated and controlled. Thanks to these institutions, the phenomenon of drug promotion as a source of profit for the pharmaceutical industry does not exist in Cuba.[2] Likewise, Villada and Sanchez (2019) tell us that, in the City of Pereira, Colombia, unregulated web spaces, social network platforms and smartphone applications are directly involved in the consumption of poor quality, counterfeit and/or illegal medical products.[3]

At the national level, Ortiz (2020) tells us that in the district of Trujillo-Iquitos, the consumption of medicines during the health emergency was mainly affected by social, cultural, personal, and psychological factors.[4] Meanwhile, according to Socican (2013), in Peru the lack of oversight of pharmaceutical advertising, laws, regulations, and codes of conduct causes the media to breach several ethical violations and illegal practices that are undermining the rights of Customers.[5] On the other hand, in the journal Tsafiqui et al. (2021) titled "Regulation of pharmaceutical products in Peru" indicates that pharmaceutical advertising is a tool used by the competition in the market providing information such as characteristics, advantages and disadvantages, constituting a dynamic and competitive information channel for consumers to make better consumption decisions about a drug.[6]

Regionally, Sosa (2019) tells us that, in the A.A.H.H. 12 de agosto-San Martin de Porres, Lima, the lack of time, low level of knowledge, the difficulty of access to health services, dissatisfaction with health services and acceptance of the sale without prescription leads to self-medication, and that on the contrary consumers are not influenced by media to obtain OTC drugs.[7] Meanwhile, Digemid and Minsa (2014) made a bulletin on promotion and pharmaceutical advertising applied since 1946 indicating that they are actions promoted to persuade the selection, acquisition, prescription and use of a certain pharmaceutical product, inducing users to acquire a lot of units, based on communicative policies.[8] On the other hand, J. Fernandez (2020) recommends allowing certain drugs to be advertised and promoted without restrictions, although they can only be dispensed with medical prescription in the same way as OTC drugs, but taking into account the prior approval of the DIGEMID.[9]

At the local level, Mayma et al. (2013) in Cercado de Lima conducted 11-question surveys of people aged 18 to 65 years old, classified by gender (male and female) and socioeconomic level. The users agree that 70% of them buy medicines influenced by pharmaceutical advertising and 55% do so because of their socioeconomic level.[10] This information has been confirmed when users approach pharmacies requesting one or another drug without having had any level of diagnosis or information about their ailment based only on pharmaceutical advertising or on the recommendation of an acquaintance or relative.

The present study focuses on the pharmaceutical advertising that users perceive in order to request OTC drugs without having had any medical review or diagnostic level by a medical professional.

This research is carried out with the purpose of contributing to the knowledge that exists on pharmaceutical advertising and the consumption of OTC drugs, whose results will be systematized in a proposal, to adhere it as knowledge and evolution to the health sciences, since it will be possible to demonstrate that there is a relationship between pharmaceutical advertising and the consumption of OTC drugs.

In order to obtain the objectives of the present study, it is descriptive and observational in nature, providing results that can contribute to research with current data and of great relevance for subsequent research studies.

This study is justified in practice because it helps to measure the relationship that will exist between pharmaceutical advertising and the consumption of OTC drugs, and the results of this study will also help to determine how pharmaceutical advertising is related to and influences the consumption of OTC drugs.

The following general question was posed: What is the relationship between pharmaceutical advertising and the consumption of OTC drugs among users of the SUPERFAR drugstore in Barrios Altos-Cercado de Lima, 2022?

Finally, the purpose of this study was to determine the relationship between pharmaceutical advertising and the consumption of OTC drugs among users of the SUPERFAR drugstore in Barrios Altos-Cercado de Lima, 2022.

Method

The research was of the hypothetico-deductive type, with a quantitative approach. The type of research was basic, and the level was descriptive and correlational; finally, the design was non-experimental.[11–13]

The study population is a defined, limited and accessible set of cases, which will be indicated for the selection of the sample, which has to meet many predetermined criteria. In addition, the population is finite.[14] The following study is made up of 900 users who attended the pharmacy. SUPERFAR de Barrios Altos-Cercado de Lima, during the month of February on weekdays from Monday to Friday.

To define the sample size, a formula for finite populations was used, with a confidence level of 95% and a margin of error of 5%.

$$n = \frac{Z^2 * P * Q * N}{E^2(N-1) + Z^2 * P * Q * N}$$

Where:

n = Sample size in finite populations.

N = Size of the population to be studied.

$p \ y \ q$ = Statistical values for the population, when the indicators are unknown (p = 0.5 and q = 0.5).

E = Error 0.05%

Z = Reliability margin

This is the calculation used to obtain the sample size in the population of the SUPERFAR drugstore in Barrios Altos-Cercado de Lima.

$$n = \frac{1.96^2 * 0.5 * 0.5 * 900}{0.05^2(900-1)1.96^2 * 0.5 * 0.5} = 269$$

- The study sample consisted of 269 users considered during the month of February (2022), from Monday to Friday of each week, until the indicated number of users was reached.

  Inclusion criteria:

  o   Users of both genders.

  o   Users over 18 years of age.

  o   Voluntary acceptance of the surveys.

  o   Users who come to shop at the SUPERFAR drugstore.

Exclusion criteria:

- o   Persons under 18 years of age.

- o   Do not accept the questionnaire

- o   Do not buy medicines in the SUPERFAR drugstore.

A simple random probability sampling was carried out, where all the people had the same possibility of being chosen and being part of our research. This is a basic sampling procedure, its main characteristic guaranteeing that the selection is carried out from a list of the population, giving each element an equal chance.[15]

The technique used was personal surveys, which were used to evaluate the users who went to the SUPERFAR drugstore in Barrios altos-Cercado de Lima. For this research, the questionnaire instrument was used, for which the Likert scale was used. The instrument is made up of 11 questions for variable 1: Pharmaceutical advertising and nine questions for variable 2: Consumption of OTC drugs. Below, we present the technical data sheet of the survey instrument, where we will observe a general summary of the instrument and the research.[16]

The validation of the instrument for this study was carried out through the judgment of experts who validated the content, this is because they are professionals with a higher university degree; they were the methodologists; Antonio Guillermo Ramos Jaco, Gabriel Enrique León Apac, and Orlando Juan Márquez Caro.

The reliability of the instrument used for this study was the Cronbach's alpha coefficient method, this coefficient will allow us to determine the internal consistency and homogeneity within the dimensions, using as a pilot test approximately 27 subjects, with a zero value "0": null reliability and a "1" total reliability, these results indicate whether the questionnaire instrument is reliable to determine the relationship between pharmaceutical advertising and consumption of OTC drugs in users of the SUPERFAR drugstore in Barrios Altos-Cercado de Lima, 2022. The Cronbach's alpha coefficient method obtained is 0.937, providing total reliability.

A normality test was also performed on the pharmaceutical advertising message dimension, the mass media dimension, the pharmaceutical product promotion dimension, the dimension of excessive consumption of drugs under the influence and responsibility of the pharmaceutical industry, and the OTC drug consumption variable, obtaining a value of 0.000 for

Table 1. Instrument data sheet.

Technical data	
Name:	Questionnaire on pharmaceutical advertising and consumption of over-the-counter (OTC) medicines.
Authors:	Leydi Diana Ochoa Ayvar Francisco Teodoro Palacios Valverde
Affiliation:	Universidad Privada Norbert Wiener, Perú
Technique:	Questionnaire
Scope:	Users of the Superfar drugstore in Barrios altos-Cercado de Lima.
Significance:	To determine the relationship between pharmaceutical advertising and the consumption of over-the-counter drugs.
Administration:	To determine the relationship existing between pharmaceutical advertising and the consumption of over-the-counter drugs.
Scale:	(1) Never (2) Almost never (3) Sometimes (4) Almost always (5) Always.
Scales:	Scales: None, some, all
Evaluators:	Evaluators: Tutors and Counselors.
Purpose:	To raise awareness of the relationship between pharmaceutical advertising and the consumption of over-the-counter (OTC) drugs and to improve the rational use of drugs among users.
Material:	Data collection forms, Excel database and SPSS Version.22 program.

all of them. Therefore, it can be inferred that the sample data present a non-normal distribution, and the Spearman's Rho non-parametric statistic should be used.[17,18]

The research work was developed through the survey technique and the questionnaire was used as an instrument, which was validated by three experts in the research topic, the surveys are divided into variable 1, pharmaceutical advertising, consisting of 11 questions and variable 2, OTC drug consumption, consisting of nine questions for a total of 20 items. The results will be organized in the Microsoft Excel 2019 program (RRID:SCR_016137) and will allow us to analyze, manage and share decision making. They will then be transferred to IBM SPSS Statistics version 22 (Statistical package for social sciences) (RRID:SCR_002865). The descriptive statistical analysis allowed us to summarize the information in graphs and tables, which were illustrated with images. To analyze our research hypothesis, we used Spearman's correlation coefficient. Likewise, the SPSS version 22 program indicated that the data had a non-normal distribution with a P-value of less than 0.05.

For this study, we took into account the regulations of the code of ethics for research at the Norbert Wiener Private University, taking into account the ethical criteria for research, which indicates that we must ensure the protection of the rights, safety and well-being of human beings who, in the use of their faculties and free will, accept to be subjects of the study(47); for this reason, informed consent was obtained in a CIE-VRI research study so that the user could express his intention to participate in the survey voluntarily. The consent of the SUPERFAR drugstore, which provided its facilities to conduct the surveys, was also authorized.

Consent

Regarding the consent for the participation in the research, it should be indicated that the instrument applied, had a written informed consent for the application of this, which was intended to provide information to the person about the survey. Information such as the use of the potential answers, the duration of the survey, the receipt of an incentive for answering the questionnaire and the assurance that the identity of each person would be protected, always keeping them anonymous.

Likewise, the survey was approved by the ethics committee of the Universidad Norbert Wiener with the resolution of document N°138-2022-DFFB/UPNW issued by the Faculty of Pharmacy and Biochemistry.

Results

Table 2 shows that of the 269 users surveyed, 16.7% (45) indicate that no one is influenced by pharmaceutical advertising to consume OTC medicines, 59.5% (160) are some and 23.8% (64) represent the range all are influenced by pharmaceutical advertising to consume OTC medicines.

Table 3 shows that of the 269 users surveyed, 21.9% (59) indicate that no one is influenced by the pharmaceutical advertising message to consume OTC medicines, 65.1% (175) are some and 23.8% (64) represent the range all are influenced by the pharmaceutical advertising message to consume OTC medicines.

Table 2. Variable pharmaceutical advertising.

Scale	Frequency	Percentage
Nobody	45	16.7
Some	160	59.5
All	64	23.8
Total	269	100.0

Source. Own elaboration.

Table 3. Pharmaceutical advertising message dimension.

Scale	Frequency	Percentage
Nobody	59	21.9
Some	175	65.1
All	35	13.0
Total	269	100.0

Source. Own elaboration.

Table 4 shows that of the 269 users surveyed, 27.5% (74) indicate that no one is influenced by pharmaceutical mass media to consume OTC medicines, 61.0% (164) are some and 11.5% (31) represent the range all are influenced by pharmaceutical mass media to consume OTC medicines.

Table 5 shows that of the 269 users surveyed, 22.7% (61) indicate that no one is influenced by pharmaceutical product promotion to consume OTC medicines, 61.0% (164) are some and 11.5% (31) represent the range all are influenced by pharmaceutical advertising to consume OTC medicines.

Table 6 shows that of the 269 users surveyed, 38.3% (103) indicate that no one practices excessive consumption of drugs under the influence and responsibility of the pharmaceutical industry 50.6% (136) are some and 11.2% (30) indicate that all practice excessive consumption of medicines under the influence and responsibility of the pharmaceutical industry.

Table 7 shows that of the 269 users, 21.2% (57) do not consume OTC medicines induced by pharmaceutical advertising, 55.8% (150) represent the range of some and 23.0% (62) all consume OTC medicines induced by pharmaceutical advertising.

Table 4. Pharmaceutical mass media dimension.

Scale	Frequency	Percentage
Nobody	74	27.5
Some	164	61.0
All	31	11.5
Total	269	100.0

Source. Own elaboration.

Table 5. Promotion dimension of the pharmaceutical product.

Scale	Frequency	Percentage
Nobody	61	22.7
Some	155	57.6
All	53	19.7
Total	269	100.0

Source. Own elaboration.

Table 6. Dimension of excessive consumption of medicines under the influence and responsibility of the pharmaceutical industry.

Scale	Frequency	Percentage
Nobody	103	38.3
Some	136	50.6
All	30	11.2
Total	269	100.0

Source. Own elaboration.

Table 7. Variable consumption of over-the-counter medicines.

Scale	Frequency	Percentage
Nobody	57	21.2
Some	150	55.8
All	62	23.0
Total	269	100.0

Source. Own elaboration.

Table 8 shows that the P value is less than 0.05, which indicates that there is a correlation, with a Spearman's Rho value of r = 0.729 indicating that the correlation is strong and direct between variable 1 pharmaceutical advertising and variable 2 consumption of OTC drugs in users of the SUPERFAR drugstore in Barrios Altos-Cercado de Lima, 2022.

Table 9 shows that the P value is less than 0.05, which indicates that there is a correlation, with a Spearman's Rho value of r = 0.597 indicating that the correlation is moderate and direct between dimension 1 the pharmaceutical advertising message and variable 2 the consumption of over-the-counter (OTC) drugs in users of the SUPERFAR drugstore in Barrios Altos-Cercado de Lima, 2022.

Table 10 shows that the P value is less than 0.05, which indicates that there is a correlation, with a Spearman's Rho value of r = 0.525 indicating that the correlation is moderate and direct between dimension 2 mass media and variable 2 consumption of over-the-counter (OTC) drugs among users of the SUPERFAR drugstore in Barrios Altos-Cercado de Lima, 2022.

Table 11 shows that the P value is less than 0.05, which indicates that there is a correlation, with a Spearman's Rho value of r = 0.637 indicating that the correlation is moderate and direct between dimension 3, Promotion of the pharmaceutical

Table 8. Hypothesis test. H0: There is no significant relationship between pharmaceutical advertising and the consumption of OTC medicines among users of the SUPERFAR drugstore in Barrios Altos-Cercado de Lima, 2022. H1: There is a significant relationship between pharmaceutical advertising and the consumption of OTC medicines among users of the SUPERFAR drugstore in Barrios Altos-Cercado de Lima, 2022.

		Correlations		
			Pharmaceutical advertising	**Consumption of over-the-counter (OTC) medicines**
Spearman's Rho	Variable 1: Pharmaceutical advertising	Correlation coefficient	1.000	0.729
		Sig. (bilateral)		0.000
		N	269	269
	Variable 2: Consumption of over-the-counter (OTC) medicines	Correlation coefficient	0.729	1.000
		Sig. (bilateral)	0.000	
		N	269	269

Source. Own elaboration.

Table 9. Specific hypothesis 1. H0: There is no significant relationship between the pharmaceutical advertising message and the consumption of OTC drugs among users of the SUPERFAR drugstore in Barrios Altos-Cercado de Lima, 2022. H1: There is a significant relationship between the pharmaceutical advertising message and the consumption of OTC drugs in users of the SUPERFAR drugstore in Barrios Altos-Cercado de Lima, 2022.

		Correlations		
			Pharmaceutical advertising message	**Consumption of over-the-counter (OTC) medicines**
Spearman's Rho	Pharmaceutical advertising message	Correlation coefficient	1.000	0.597
		Sig. (bilateral)	.	0.000
		N	269	269
	Variable 2: Consumption of over-the-counter (OTC) medicines	Correlation coefficient	0.597	1.000
		Sig. (bilateral)	0.000	.
		N	269	269

Source. Own elaboration.

Table 10. Specific hypothesis 2. H0: There is no significant relationship between the mass media and the consumption of OTC drugs among users of the SUPERFAR drugstore in Barrios Altos-Cercado de Lima, 2022. H1: There is a significant relationship between mass media and the consumption of OTC drugs among users of the SUPERFAR drugstore in Barrios Altos-Cercado de Lima, 2022.

	Correlations			
			Mass media	**Consumption of over-the-counter (OTC) medicines**
Spearman's Rho	Mass media	Correlation coefficient	1.000	0.525
		Sig. (bilateral)	.	0.000
		N	269	269
	Consumption of over-the-counter (OTC) medicines	Correlation coefficient	0.525	1.000
		Sig. (bilateral)	0.000	.
		N	269	269

Source. Own elaboration.

Table 11. Specific hypothesis 3. H0: There is no significant relationship between the promotion of the pharmaceutical product and the consumption of OTC drugs among users of the SUPERFAR drugstore in Barrios Altos-Cercado de Lima, 2022. H1: There is a significant relationship between the promotion of the pharmaceutical product and the consumption of OTC drugs in users of the SUPERFAR drugstore in Barrios Altos-Cercado de Lima, 2022.

	Correlations			
			Promotion of the pharmaceutical product	**Consumption of over-the-counter (OTC) medicines**
Rho de Spearman	Promotion of the pharmaceutical product	Correlation coefficient	1.000	0.637
		Sig. (bilateral)	.	0,000
		N	269	269
	Consumption of over-the-counter (OTC) medicines	Correlation coefficient	0.637	1.000
		Sig. (bilateral)	0.000	.
		N	269	269

Source. Own elaboration.

product, and the consumption of OTC drugs in users of the SUPERFAR drugstore in Barrios Altos-Cercado de Lima, 2022.

Table 12 shows that the P value is less than 0.05, which indicates that there is a correlation, with a Spearman's Rho value of $r = 0.670$ indicating that the correlation is moderate and direct between dimension 4, excessive consumption of drugs under the influence and responsibility of the pharmaceutical industry, and variable 2, the consumption of OTC drugs among users of the SUPERFAR drugstore in Barrios Altos-Cercado de Lima, 2022.

Discussion and conclusion

The main limitations of this research were the access and lack of information in Spanish that exists in the relevant pages for our research, which often require registration or payment to access their information. On the other hand, the time limited by the SUPERFAR Pharmaceutical establishment in barrios altos-cercado de lima to carry out the surveys with the established opening hours to carry out the surveys to the users.

In the general hypothesis, there is a significant correlation between pharmaceutical advertising and the consumption of OTC drugs in users of the SUPERFAR pharmacy in Barrios Altos-Cercado de Lima, 2022, because a P value of 0.000 less

Table 12. Specific hypothesis 4. H0: There is no significant relationship between the excessive consumption of medicines under the influence and responsibility of the pharmaceutical industry and the consumption of OTC medicines among users of the SUPERFAR drugstore in Barrios Altos-Cercado de Lima, 2022. H1: There is a significant relationship between the excessive consumption of medicines under the influence and responsibility of the pharmaceutical industry and the consumption of OTC medicines in users of the SUPERFAR drugstore in Barrios Altos-Cercado de Lima, 2022.

Correlations			Excessive drug consumption under the influence and responsibility of the pharmaceutical industry	Consumption of over-the-counter (OTC) medicines
Rho de Spearman	Excessive drug consumption under the influence and responsibility of the pharmaceutical industry	Correlation coefficient	1.000	0.670
		Sig. (bilateral)	.	0.000
		N	269	269
	Consumption of over-the-counter (OTC) medicines	Correlation coefficient	0.670	1.000
		Sig. (bilateral)	0.000	.
		N	269	269

Source. Own elaboration.

than 0.05 and Spearman's Rho of r = 0.729 were found, indicating that the strength of correlation is high and direct between the two variables, thus rejecting the null hypothesis and approving the alternative hypothesis. Coinciding with Gamarra[19] who pointed out in his research that there is a relationship between misleading advertising and the violation of consumer rights, evidencing in his results a positive relationship with a Pearson's percentage of 0.857 being the significant value (0.000 < 0.05) considered positive and direct relationship between pharmaceutical advertising and the violation of the buyer's rights. As mentioned by Domingo *et al.*,[20] advertising has an important influence on the public and these advertisements should contribute to making rational decisions on OTC drugs; however, the information is very limited and almost always omits the dosage, duration of treatment, adverse effects and contraindications.

Analyzing the specific Hypothesis 1 There is a significant relationship between the pharmaceutical advertising message and the consumption of OTC medicines in users of the SUPERFAR drugstore in Barrios Altos-Cercado de Lima, 2022, we found a P value of 0.000 less than 0.05 and Spearman's Rho of r = 0.597 which indicates that the strength of correlation is moderate and direct between dimension 1 and variable 2, thus rejecting the null hypothesis and approving the alternative hypothesis. In this way, we can contradict the research conducted by Cancho and Echevarría[21] who determined the relationship between factors associated with self-medication and classes of drugs in users of the Botica Biofarma, indicating that the Family factor and convincing by the pharmaceutical staff are the most influential means for the acquisition of over-the-counter drugs with a margin of error of 16.60%, indicating that there is no relationship between the variables. Unlike Rodriguez J.[22] states that the pharmaceutical advertising message aims to inform, remind about the products or services that are intended to provide to the population, or potential consumers who have needs to soothe or persuade some discomfort immediately.

Considering the specific hypothesis 2, there is a significant relationship between mass media and the consumption of over-the-counter (OTC) medicines in users of the SUPERFAR drugstore in Barrios Altos-Cercado de Lima, 2022, the results were obtained with a P value of 0.000 less than 0.05 and Spearman's Rho of r = 0.525, indicating that the strength of correlation is moderate and direct between dimension 2 and variable 2, thus rejecting the null hypothesis and approving the alternative hypothesis. Therefore, in relation to their research by López and Reátegui[23] to discover opportunities for improvement for the pharmaceutical sector, they point out that the most influential pharmaceutical advertisements are the Social Networks with entertaining, shocking and credible contents, this was determined by means of surveys which they then proceeded to analyze in IBM statistics SPSS version 25, providing a correlation coefficient of 0.249 with a significance of 0.000 considering it to be positive. Agreeing with Gutiérrez A. and Mora E.[24] consider that the most influential means of communication in the population is the audiovisual media because they fix the products in the mind of the consumers unconsciously and these do not consume them for their therapeutic properties in themselves, but for the added values provided by pharmaceutical advertising.

With respect to specific hypothesis 3, there is a significant relationship between the promotion of the pharmaceutical product and the consumption of over-the-counter (OTC) medicines among users of the SUPERFAR drugstore in Barrios Altos-Cercado de Lima, 2022. A P value of 0.000 less than 0.05 and Spearman's Rho of r = 0.637 were found, indicating that the correlation is moderate and direct between dimension 3 and variable 2, thus rejecting the null hypothesis and approving the alternative hypothesis. In such a way we can support what was exposed by Lopez[25] who determined the factors that influence the acquisition of brand and/or generic drugs in the pharmacy of the San Juan de Dios Cusco Clinic, calculating Pearson's Chi-squared for dimension 2 external factors has a P value = 0.000 is less than α = 0.05, leaving evidence of a positive result for its indicators price, advertising and pharmacotherapeutic alternatives. As mentioned by Tipan, *et al.*, drug promotion is a persuasive activity carried out by manufacturers and distributors that generate conflicts of interest by giving free gifts or lowering their prices unconsciously, users have consumed products from that laboratory.[26]

Finally, in the specific hypothesis 4, there is a relationship between the excessive consumption of medicines under the influence and responsibility of the pharmaceutical industry and the consumption of OTC medicines in users of the SUPERFAR drugstore in Barrios Altos-Cercado de Lima, 2022. A P value of 0.000 less than 0.05 and Spearman's Rho of r = 0.670 were found, indicating that the correlation strength is moderate and direct between dimension 4 and variable 2, thus rejecting the null hypothesis and approving the alternative hypothesis, Therefore, in relation to their research by Bastos and Garcia[27] to identify the habits of consumption of OTC drugs by university students in the health area, it was obtained that self-medication is not harmful to health with a P value of 0.0015 lower than 0.05, indicating that there is an association between the values and in criteria at the time of consuming or buying a medicine has a P value = 0.0463 < 0.05 it was evidenced that more than half of the student population agrees that self-medication practices are harmful to health, but they consider that the symptoms treated are not serious and that they are familiar with these OTC medicines. As mentioned by Lobo F.[28] states that drug advertising is largely responsible for the education on the excessive consumption of drugs by placing in the media images of doctors or health personnel recommending their products and providing the assurance that a product is good for their therapy and creating a vicious circle that is difficult to break.

In conclusion, in relation to the general objective: the relationship between pharmaceutical advertising and the consumption of OTC medicines in users of the SUPERFAR drugstore in Barrios Altos-Cercado de Lima, 2022, was determined, based on the result of Spearman's Rho value of r = 0.729, indicating that the correlation is strong and direct. In relation to specific objective 1: the relationship between dimension 1 (pharmaceutical advertising message) and variable 2 (consumption of over-the-counter medicines) was determined, based on the result of Spearman's Rho value r = 0.597 indicating that the correlation strength is moderate and direct. In relation to specific objective 2: the relationship between dimension 2 (pharmaceutical mass media) and variable 2 (consumption of OTC medicines) was determined, based on the result of Spearman's Rho value r = 0.525, indicating that the strength of correlation is moderate and direct. In relation to specific objective 3: the relationship between dimension 3 (promotion of the pharmaceutical product) and variable 2 (consumption of over-the-counter medicines) was determined, based on the result of Spearman's Rho value of r = 0.637, indicating that the correlation is moderate and direct. In relation to specific objective 4: the relationship between dimension 4 (excessive consumption of medicines under the influence and responsibility of the pharmaceutical industry) and variable 2 (consumption of OTC medicines) was determined, based on the result of Spearman's Rho value of r = 0.670 indicating that the correlation strength is moderate and direct.

Data availability

Zenodo: Pharmaceutical advertising and the consumption of over the counter (OTC) medicines in users of the Superfar drugstore in Barrios Altos-Cercado de Lima, 2022, https://doi.org/10.5281/zenodo.6544660.[29]

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Current Peer Review Status: ✗ ✗

Version 1

Reviewer Report 20 March 2023

✗ **Ashenafi Kibret Sendekie** (iD)

University of Gondar, Gondar, Ethiopia

Thank you for giving me the opportunity to review a paper entitled "Pharmaceutical advertising and the consumption of over the counter (OTC) medicines in users of the SUPERFAR drugstore in Barrios Altos-Cercado de Lima, 2022"

The authors came up with an interesting area, pointing out the importance of providing evidence and literature in the area. However, the manuscript could be carefully revised unless it is difficult to publish in its current form.

General comments to the authors
1. There is unnecessary repetition of words and unclear and ambiguous statements throughout the manuscript.

2. Needs some English editing

3. Avoid unnecessary and uncommon abbreviations.

4. Use the full length and abbreviations together for abbreviated phrases when they come up for the first time. And then, use the abbreviation form consistently.

5. Use words and phrases consistently, particularly for major objectives.

Specific comments

Abstract
1. How were the outcomes for each objective measured? At least some measuring methods and techniques for pharmaceutical advertising and consumption could be mentioned in the abstract.

2. And please verify whether the abstract is written per the journal standard.

Introduction
1. It is written just as normal, not organized well.

2. There are statements without reference. Please ensure that the sources of all statements need to be acknowledged by citing them.

3. You are mentioning the title, the journal, etc. of some of the reference papers. Mentioning this much detail may not be necessary. Enough to mention the study setting, including country, design, or author, and focus on the issue and what they did or found.

4. The research questions and hypotheses are disorganized, and it is better to reorganize your research questions and hypotheses.

Methods
1. Where is Table 1 cited in the manuscript? I didn't find its importance, and it is not clear.

2. "Persons under 18 years of age: Do not accept the questionnaire; do not buy medicines in the SUPERFAR drugstore." These are mentioned in the exclusion criteria. But these were totally excluded from the beginning. Subjects who need to be excluded should be eligible to include first; then they might be excluded for different reasons. Thus, there is no need to exclude this population because it is not already included.

3. There are proposal-like statements in the method section that need to be changed.

4. You stated that the outcome measurement of pharmaceutical advertising was determined using 11 items, and similarly, OTC drug consumption was measured using 9 items using a Likert scale score. Then what is final? How the score was counted? What was the value of each scale? Is an increase or decrease in score to be counted as good on the outcome measures? These issues need to be presented in detail and clearly.

5. Outcome (pharmaceutical advertising and OTC drug consumption) measures need to be clearly presented.

Results
1. The study had a total of 269 participants, according to the results. How could a 100% response rate be achieved? It is preferable to share any data collection experience; it will be beneficial to others as well.

2. The result should be reorganized and presented based on the objectives.

3. The description of the tables should be concise and focused on the main variables of the study.

Discussion
1. Need to focus on the major objectives and findings.

2. The gaps mentioned in the methods and results sections need to be clear and correspond to the discussion.

Conclusion
1. Need to be concise and focused on the major findings.

Is the work clearly and accurately presented and does it cite the current literature?
No

Is the study design appropriate and is the work technically sound?
Partly

Are sufficient details of methods and analysis provided to allow replication by others?
Partly

If applicable, is the statistical analysis and its interpretation appropriate?
Partly

Are all the source data underlying the results available to ensure full reproducibility?
No

Are the conclusions drawn adequately supported by the results?
Partly

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Quality use of medicines, pharmacy practice, chronic medication care

I confirm that I have read this submission and believe that I have an appropriate level of expertise to state that I do not consider it to be of an acceptable scientific standard, for reasons outlined above.

Reviewer Report 25 July 2022

https://doi.org/10.5256/f1000research.133557.r143788

✗ **Renly Lim** (iD)

Quality Use of Medicines and Pharmacy Research Centre, UniSA Clinical and Health Sciences, University of South Australia, Adelaide, SA, Australia

Thank you for the opportunity to review the manuscript. The topic is very interesting, however, the methodology and findings are questionable. More specific comments below:
1. There's limited details in the abstract methods section. It is unclear what the authors actually did. How did the authors define pharmaceutical advertising. Similarly how did the authors define consumption? How was this measured?

2. The introduction section is written rather informally more like a news article instead of a

journal article.

3. The last few paragraphs in the introduction section are also confusing – why did the authors have separate justification, general question and purpose?

4. In the methods section, the authors presented methods and results of validation of the tool, I am not sure why this was included? Shouldn't this be reported separately in another paper, for example?

5. It is also unclear how the authors defined "influence by pharmaceutical companies"

6. The results section is really difficult to follow, with 12 tables presented one after the other.

Is the work clearly and accurately presented and does it cite the current literature?
No

Is the study design appropriate and is the work technically sound?
No

Are sufficient details of methods and analysis provided to allow replication by others?
No

If applicable, is the statistical analysis and its interpretation appropriate?
Partly

Are all the source data underlying the results available to ensure full reproducibility?
Partly

Are the conclusions drawn adequately supported by the results?
No

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Drug utilisation, medication safety, quality use of medicines, pharmacy practice

I confirm that I have read this submission and believe that I have an appropriate level of expertise to state that I do not consider it to be of an acceptable scientific standard, for reasons outlined above.

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