

Magnitude and Determinants of Self-Medication as Part of Self-Care Among Adult Population of Western Saudi Arabia – A Survey

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ABSTRACT

To present the prevalence, determinants, and components of self-medication of eye medications among the Western Saudi adult population. In 2024, a sectional survey was conducted among adult Saudi persons using eye medication. A closed-ended questionnaire noted the demographic ocular profile, use of self-eye medication, presenting symptoms, and complications. The prevalence and factors associated with self-medication of eye medications were estimated. We surveyed 728 participants. The main symptoms were burning in the eyes, red eyes, dryness of the eyes, and itching. Artificial tears and antibiotic eye medications were the leading self-medicated eye preparations. Nearly half of the participants read instructions for eye medication usage and side effects. One in six uses the recommended dose and medication for a longer duration. Half do not dispose of eye drop bottles, and 25% use medicines prescribed for others. The prevalence of self-medication was 18.4% (95% CI, 15.6–21.2). If persons are considered using old prescriptions for current ailments, it could be as high as 33.8% (95% CI 30.4–37.2). Believing that symptoms are trivial, the condition does not require ophthalmic professionals' guidance, and advice from family members and friends was the main enabler for self-medication. Age group <30 years ($P = 0.01$) and use of contact lenses ($P = 0.01$) were predictors of self-eye medications. The rate of self-eye-medication is low. To promote self-care, patient education, strict monitoring of laws regarding over-the-counter eye medicine, and redefining the role of optometrists in this regard are recommended.

Keywords: Self-care: self-medication, eye medication, health behavior, visual disabilities, abuse of eye medications

INTRODUCTION

World Health Organization and United Nations Millennium Goals consider self-medication (SM) as part of Self-Care and well-being¹. Self-medication (SM) is an increasing global public health issue and has varying interpretations of its definition. It is based on how the medication was obtained, if a health professional was involved, the source of the medication, and the reason for the SM. SM includes self-care, not following a prescription, reusing stored drugs, and sharing and lending medicines²⁻³. Appropriate self-medication reflects the patient's active role in health care. On the other hand, self-medication is unsafe as it can cause delay in seeking medical advice, incorrect self-diagnosis, choice of therapy, administration, dosage, drug interactions, severe adverse reactions, and risk of dependence, which can cause toxic reactions^{1,4}. Over-the-counter (OTC) medications are common culprits in self-medication. This behavior certainly affects the healthcare system and pharmaceutical industries⁵. When drugs are used for purposes other than their prescribed medical purposes or in ways and doses that are not medically approved, they are considered abuse⁶. The eyes are vital components of the visual apparatus. Both children and adults are scared of instilling medications in the eyes. However, many countries, including Saudi Arabia, note the application of traditional medicines in the eyes and eye medication without consulting authorized eye professionals⁷. In addition, many OTC ophthalmic medications are available to the general population at pharmacies and optical outlets without a prescription⁸.

In different studies, the rate of ophthalmic self-medication without a prescription ranged from 25.6% to 42% of total eye medication users^{9,10-12}. Nearly two-thirds of persons using eye medications before approaching eye care professionals for their eye ailments in Lebanon had not read the instructions⁹. Antibiotics and steroids were the most common ophthalmic drugs used for self-medication^{9,11}. Among the Saudi population, the rate of self-medication with ophthalmic drops and ointments was 67%, and 47.4% of them did not know the name of the drug they used¹³.

In Saudi Arabia, laws for practicing health care are well-defined. Healthcare professionals, including ophthalmologists, physicians, and technicians, include optometrists in these guidelines¹⁴. Optometrists refer their patients to Ophthalmologists if they require laser treatment, ocular surgery, and eye medications. They are not permitted to prescribe any eye medications as they are in the USA¹⁵. Eye medications are available in private pharmacies and dispensing centers in different hospitals. In addition, personnel at optical shops and optometrists provide visual aids, contact lenses, and related accessories. Often, eye medications for dry eye and moistening eyes with extended usage of contact lenses are given in these optical outlets. With this background, understanding self-treatment, its enablers, and components related to patient behavior for eye medication usage will be of interest to further strengthen eye care and pharmacy-related policies in the Kingdom.

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We present the magnitude and determinants of self-medication of ophthalmic preparations by the adult population of Western Saudi Arabia in 2024. This information recommends strengthening the study area's eye care and drug delivery systems.

METHODS

The research and ethical committee of XXXXXXXXXX, approved this survey. The study population was the adult population of Western Saudi Arabia using eye medication. Requests for participation were sent randomly via social media apps, primarily WhatsApp®, which is the most widely used messaging/social media app in this region. Informed written consent was obtained for the participation. Tenets of the Helsinki Declarations were abided by at different stages of the present research. Those aged 18 and older who reside in Western Saudi Arabia were included in the study. Those declining to participate or having grossly incomplete survey responses were excluded from the analysis.

To calculate the sample size for this cross-sectional survey, we assumed that the prevalence of self-medication among the study population would be 62.4%, as reported by Alharbi et al¹³. To achieve a 95% confidence interval and a 5% acceptable error margin with a clustering factor of 2, we needed at least 707 participants. We used the recommended software from the Rollins School of Public Health, Emory University, USA, to calculate the sample size for a survey¹⁶.

The questionnaire was adopted from previously published studies^{9,10,13}. It included the participants' sociodemographic characteristics, the inappropriate use of ophthalmic preparations, and misuse/abuse-related complications (Appendix: 1). We reverse-translated the questionnaire from English to Arabic, the native language. It was piloted on 10 participants not involved in the present survey.

The data was collected using Google Forms. Ten volunteer medical students used laptops and tablets to approach participants and collect their responses. The main sites where participants were approached for the survey were university canteens, hostels, supermalls, and mosques.

The data on the Microsoft XL® spreadsheet was reviewed for consistency and duplication. Then, it was transferred into the spreadsheet of the Statistical Package for Social Studies (SPSS 25) (IBM, NY, USA). The qualitative variables were presented using numbers and percentages. The numerical variables were plotted to study the distribution. For normally distributed variables, we presented the mean and standard deviations. For non-normal distributions, we presented the median and interquartile range. To associate the outcome with determinants, we used students' t-tests to present the Odds ratio, 95% confidence interval, and two-sided P value. We estimated the chi-square test, degrees of freedom, and two-sided P value for more than two variables. A p-value of less than 0.05 was considered statistically significant.

RESULTS

The study included 728 adult residents of the Western region of the Saudi population. Their demographic and ocular profile is given in Table 1. Half of the participants were younger, and more than two-thirds were females. College graduates were the primary respondents.

Figure 1 shows the participants' presenting symptoms. The main symptoms were burning in the eyes, red eyes, dryness of the eyes, and itching.

Figure 2 shows the type of eye medications used for self-care among the adult Saudi population in Western Saudi Arabia. Artificial tears

and antibiotic eye medications were the leading self-medicated eye preparations.

Table 2 shows the responses related to the components of self-medication. Different components of self-medication for eye medication suggest more scope for educating the eye medication users to make it safe and self-care-centered. Nearly half of the participants read instructions for eye medication usage and side effects. One in six uses the recommended dose and medication for a longer duration. Half do not dispose of eye drop bottles, and 25% use medicines prescribed for others.

Table 1. Profile of survey participants for self-medication of ophthalmic medications

		Number	Percentage
Age group	18 to 29 years	388	53.3
	30 to 39 years	110	15.1
	40 to 49 years	109	15
	50 to 59 years	100	13.7
	60 years and more	21	2.9
Gender	Male	213	29.3
	Female	515	70.7
Education	School graduate	166	22.8
	College and higher	562	77.2
Employment	Students	307	42.2
	Unemployed	169	23.2
	Employed	252	34.6
Monthly income (Saudi Rials)	<5000	239	32.8
	5001 to 10,000	218	29.9
	10,001 to 15,000	97	13.3
	>15,000	174	23.9
Suffering from eye ailment	Yes	260	35.7
	No	468	64.3
Using contact lenses	Yes	107	14.7
	No	621	85.3
Eye surgery	Yes	107	14.7
	No	621	85.3
Mental health issues	Yes	33	4.5
	No	695	95.5
Aware of diagnosis of eye problem	Yes	368	50.5
	No	360	49.5
Diagnosed eye ailment	Allergy	71	9.8
	Viral conjunctivitis	21	2.9
	Bacterial conjunctivitis	9	1.2
	Glaucoma	6	0.8
	Retinal diseases	11	1.5
	Dry eye	332	45.6
	Other	60	8.2
	Do not know	314	43.1
Laterality of eye problem	Unilateral	213	29.3
	Bilateral	515	70.7
Prescribed eye medications	Yes	340	46.7
	No	302	41.5
	Not sure	86	11.8
Using eye medications	Yes	194	26.6
	No	444	61
	Not sure	90	12.4

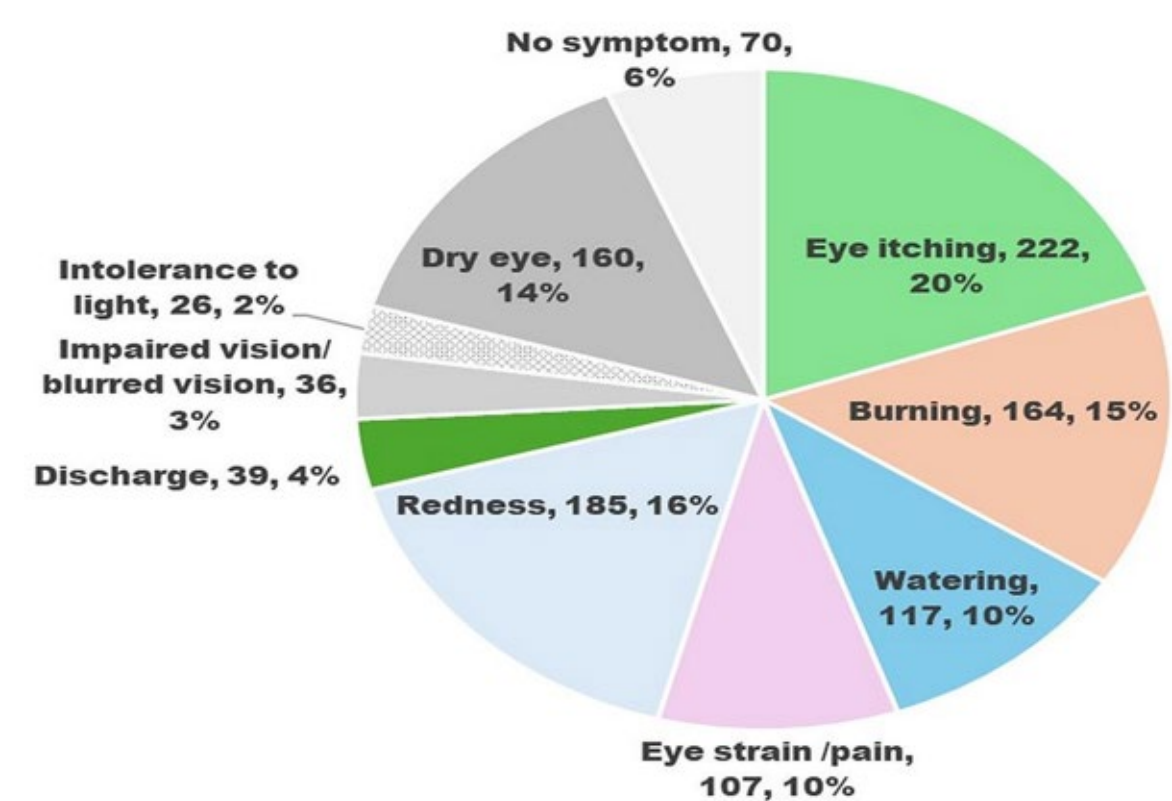


Figure 1. Participants presenting symptoms

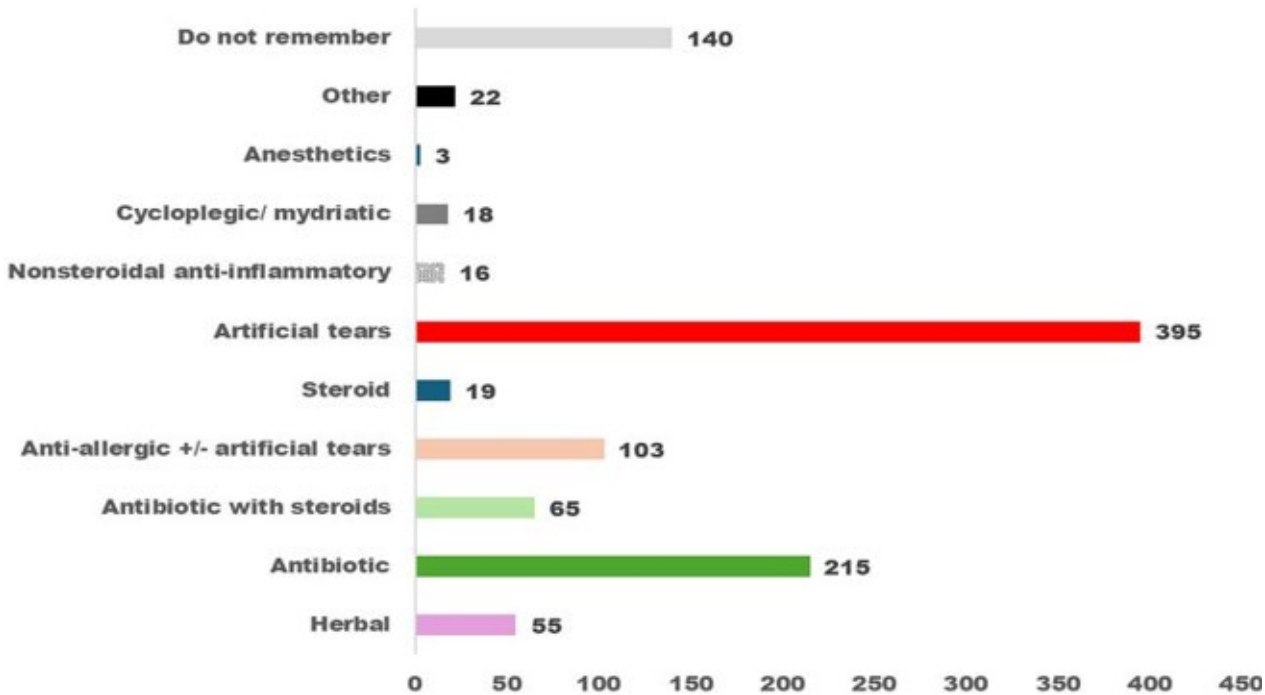


Figure 2. Type of eye medication used for self-care

Table 2. Behavior of the adult Western Saudi population related to the use of eye medications

		Number	Percentage
Read instructions on how to use	Yes	399	54.8
	No	288	39.6
	Not sure	41	5.6
Read about side-effects	Yes	359	49.3
	No	369	50.7
Used eye medication in recommended dosage	Yes	114	15.7
	No	614	84.3
Used eye medication longer than recommended	Yes	166	22.8
	No	562	77.2
Disposed bottles of eye medication	Yes	399	54.8
	No	329	45.2
Use eye medication prescribed for other	Yes	181	24.9
	No	547	75.1

Table 3. Source of advice for eye medication as part of self-care among surveyed adult Saudis

	Number	Percentage
Advice from family and friends.	222	30.5
Advice from pharmacist/optician/compounder	164	22.5
Busy for seeking doctors' help	117	16.1
Long distance for the eye service provider	115	15.8
Believe that symptoms are not significant	303	41.6
Economic reasons	56	7.7
Had medication at home	44	6
Other/ No reason	7	1
The condition does not require ophthalmologist instruction/considered qualified for self-treatment	431	59.2

Table 4. Determinants of misuse of eye medications among adult populations of Western Saudi Arabia

		Misused (N = 134)		Not misused (N = 594)		Validation
		Number	Percentage	Number	Percentage	
Age group	18 to 29 years	87	64.9	301	50.7	Chi-square = 17.6 Df = 4 P <0.001
	30 to 39 years	24	17.9	86	14.5	
	40 to 49 years	16	11.9	93	15.7	
	50 to 59 years	6	4.5	94	15.8	
	60 years and more	1	0.7	20	3.4	
Gender	Male	27	20.1	186	31.3	OR* = 0.55 (95% CI [†] 0.3; 0.9) P =0.009
	Female	107	79.9	408	68.7	
Education	School graduate	30	22.4	136	22.9	OR = 0.97 (95% CI 0.6; 1.5) P =0.91
	College and higher	104	77.6	458	77.1	
Employment	Students	69	51.5	238	40.1	Chi-square = 7.1 Df = 2 P =0.008
	Unemployed	30	22.4	139	23.4	
	Employed	35	26.1	217	36.5	
Income	<5000	49	36.6	190	32	Chi-square = 3.4 Df = 3 P =0.06
	5001 to 10,000	48	35.8	170	28.6	
	10,001 to 15,000	9	6.7	88	14.8	
	>15,000	28	20.9	146	24.6	
History of Eye disease	Yes	44	32.8	224	37.7	OR = 0.8 (95% CI 0.5; 1.2) P =0.3
	No	90	67.2	370	62.3	
History of eye surgery	Yes	11	8.2	96	16.2	OR = 0.46 (95% CI 0.2; 0.9) P =0.01
	No	123	91.8	498	83.8	
Mental health issue	Yes	9	6.7	24	4	OR = 1.7 (95% CI 0.8; 3.8) P =0.2
	No	125	93.3	570	96	
Using contact lens	Yes	37	27.6	79	13.3	OR = 2.5 (95% CI 1.6; 3.9) P <0.001
	No	97	72.4	515	86.7	

Table 3 shows different sources and enablers of self-medication. The leading reasons for self-medication of eye preparations were believing that symptoms are trivial, assuming that the condition does not require ophthalmic professionals' guidance, and seeking advice from family members and friends.

Although 194 of 728 (26.6%) participants used topical eye medications at the time of the survey, only 121 (62.4%) were prescribed topical medications. The remaining 73 (37.6%) participants used without consulting an eye professional, and used as they felt symptoms.

Of the surveyed participants, 134 current eye medication users have not been prescribed eye medications in the past. The prevalence of self-medication of topical ophthalmic medication among adult participants of the Macca region was 18.4% (95% CI 15.6 – 21.2). Suppose participants who are current eye medication users and have been given prescriptions in the past are considered self-medicating with eye medication given from the previous advice. In that case, 246 participants could be self-medicating, and the prevalence could be as high as $246/728 = 33.8\%$ (95%CI 30.4- 37. 2).

The demographic and ocular variables were associated with 134 self-medicating participants—Table 4. The variation of self-medication rate by age group 18-20 ($P < 0.001$), female gender ($P = 0.009$), students ($P = 0.008$), those without eye surgery ($P = 0.01$), and contact lens users ($P < 0.001$) was statistically significant.

Binary logistic regression analysis suggested that age group < 30 years ($P = 0.01$) and use of contact lenses ($P = 0.01$) were predictors of misuse of eye medications.

DISCUSSION

One in five to one in three adults of western Saudi Arabia in this study had self-medicated for their eye ailments. The young population and those using contact lenses are more likely to use artificial tears purchased as OTC products to address dry eye symptoms like redness, dryness, and itching. The OTC use of topical antibiotics is a matter of concern. A low rate of self-use of steroid eye medication is promising. The behavior of the adults in using eye medication about healthy practices like reading instructions for usage, knowing about possible side effects, not using medication given to others, and more prolonged usage of eye medication after opening sterile bottles was less than desired. The identified enablers, such as self-belief in the trivial nature of eye problems, not needing eye professionals' advice for selecting eye medication, and following the advice of friends, family members, and pharmacists, require further review and action.

This survey, with a large sample of the adult Saudi population of the western region of Saudi Arabia, provides essential information on the health behavior of self-eye care for minor eye ailments related to dry eye and eye strain, and the dangers of self-medication without using the safety norms of topical eye medication usage. Based on the outcomes of the present study, we recommend conducting a direct observation study of the dispensing patterns of eye medications at various pharmacies. If found to match the present study, policy needs to be strengthened for OTC eye medication in the study area to avoid drug-induced visual disabilities. The use of questionnaires that were tested in other countries reduces the risk of biased outcomes.

The prevalence of self-medication for eye products was 18.4%. It could be as high as 33.4% if the 'Don't remember' response is considered self-medicating. This was lower than 41.2% reported by Gupta and Malhotra among adult eye patients visiting the eye department of a

hospital in Northern India¹⁷. As many as 10% of patients attending the eye department of a tertiary hospital in Riyadh were self-medicating with steroid eye drops¹¹. In a study of adult eye patients in Lebanon, the self-medication rate among 265 participants was 32.4%⁹. In a web-based survey, self-medication was prevalent in 63% of adult Saudi eye patients in Riyadh¹². The wide variation in self-medication rates among the adult population in different studies could be due to targeting different populations using a web-based approach compared to eye hospital attendants. While comparing the self-medication behavior of Saudi adults, it is noted that eye preparations are used with more caution compared to oral antibiotics, which were 34% and mainly for tonsillitis and sore throat, and it was based on previous prescriptions¹⁸. For chronic health conditions among the adult Saudi population, the prevalence of self-medication was as high as 76.4%¹⁹.

In our study, being less than 30 years of age was significantly associated with self-medication and poor behavior in using eye medication norms. Dry eyes and eye strain related to uncorrected myopia, excessive screen time, and contact lens usage, both for optical and cosmetic purposes, are high among the young population^{20,21,22}. Perhaps the carefree attitude toward minor ailments and inability to spare time for medical consultations during student life could have resulted in a high self-medication rate among those < 30 years old.

In our study, females had a significantly higher rate of self-medication than males. This was also noted by Araia et al. in students of health sciences²³. In Oman, a Gulf country where health services are free of charge, evidence suggests that the female gender is not a barrier to accessing eye care services²⁴. Free-of-cost eye services in Saudi Arabia also ensure that females' access to health services is less likely to cause self-medication. Perhaps a higher myopia rate and the use of contact lenses in females could result in the use of OTC eye medication to address dry eyes and eye strain²⁵.

Contact lens users are prone to experiencing dry eyes²⁶. They are in contact with their visual aid providers. In Saudi Arabia, optometrists and opticians in optical outlets are the leading providers of CL. Despite not being legally allowed to prescribe eye medications in Saudi Arabia, they often advise their clients to use medicines for red eyes and dry eyes. Optometrists adhering to prescription regulations is a challenge in industrialized countries like Canada²⁷.

In addition to self-medication, participants also described good practices in using eye medication. Half of them did not read the instructions in the leaflet, along with the medication or information on possible side effects of eye medications. Only 15% used eye medication in the recommended dosage. One in four participants had used medications prescribed for other family members or used medication for a longer duration. Nearly half of them did not dispose of the bottles after they recovered, posing a risk to their usage. In contrast, Ellessa et al. reported that 25% of participants who practiced self-eye medications did not read pamphlets or share their medications with family members¹². The knowledge and practices of correct eye medication usage were low, even in a study in Lebanon⁹. Often, dispensing pharmacists provide information on the dosage and duration of eye medications; however, side effects monitoring and practical demonstration of instilling eye drops are mostly lacking. Both pharmacy educators and educators of population and eye patients should focus on the weaknesses in practices of eye medication found in this study to strengthen eye care and medical dispensation practices.

Our study had a few limitations; being a web-based survey, the participants may not represent the entire adult population of Western Saudi Arabia. However, the participants were literate, using

smartphones, and educated, so the outcome of the present study should be extrapolated with caution. They cannot remember the participants' replies, which should be interpreted with caution, as they could have been influenced by social desirability bias, and their responses should be considered an affirmation of self-medication. Hence, the prevalence is likely between 18.4% and 33.8%.

A self-care initiative for eye health includes eye protection from radiation, consuming a healthy diet to address age-related degenerative eye ailments, reducing screen time and abuse of Visual display devices, rational, safe eye medication usage, and spending more time outdoors and exposure to sunlight^{28,29,30}. The COVID-19 pandemic and limited outdoor mobility have taught us the benefits of eye exercises in reducing eye strain caused by overexposure to smartphones, indoor lighting, and prolonged online work³¹.

Self-medication is a crucial component of self-care promotion in the context of the Millennium Development Goals. To address the challenge of limited human resources and include the patients in decision-making regarding measures for being healthy, availing medicines for trivial health ailments, but have constant monitoring for side effects, and urgent care of drug-induced complications must be in place if self-care through self-medication is to have the desired impact of reducing the burden on health care, but still keep the population healthy. Practices of using eye medications noted in educated participants in this study were unsafe in a large proportion, and this is a matter of concern for those related to preventing visual disabilities. Proactive measures to increase knowledge about safe eye medication practices, patient counseling at the time of dispensing drugs, and demonstration of serious side effects while professionals interact with the general population through mass media could discourage unsafe self-medication and improve self-care. Sterile artificial tears used without added preservatives and chemicals may be permitted as OTC, mainly those found at risk of self-medication.

A stricter application of local laws in the Kingdom regarding prescribing and providing eye care medications, with periodic reviews of OTC medications by experts, is recommended. Although Saudi optometrists are inadequate, their role in providing eye care, including prescribing eye medications for contact lens users and persons with refractive error and eye strains, could be reviewed. They can, on one side, reduce self-medication among the adult population and, on the other side, monitor and promote self-care for eye care. In relation to eye care, self-care, and self-medication seem to be a double-edged sword as medication-induced irreversible visual disabilities are a serious threat in developing countries where resources are limited, and healthcare services are already facing the challenges of competing health issues like diabetes, age-related health issues, and reproductive health of rapidly increasing young population. Impact assessment of models of self-care through self-medication by the safe implementation of different components of eye medication usage could be an area of further research.

CONCLUSIONS

The educated adult population of western Saudi Arabia seems to have a low rate of self-medication practices for eye care, and OTC drugs are primarily for dry eye and eye strain. The components of standard and safe eye medication usage appear to be less than desired. They must be addressed in the community through mass media, and for eye patients through counseling when dispensing eye medications. The laws for eye care practices and dispensing eye medications need to be periodically reviewed and, if required, revised to promote self-care among the eye medication-literate population.

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