SELF-MEDICATION FOR PREVENTION OF COVID-19 IN UNIVERSITY STUDENTS OF THE NORTHEAST OF MEXICO

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SUMMARY

The COVID-19 pandemic has provoked an enormous impact around the world. The objective of this study was to determine the prevalence of self-medication for the prevention of COVID-19 during 2020 in a sample of university students from the northeast of Mexico. An electronic survey composed of two sections was used; the first section collects sociodemographic information, and the second section information related to self-medication for prevention of COVID-19. A total of 284 students responded to the survey, 26% reports having self-medicated to prevent COVID-19, and 34.5% reports having a family member that self-medicated to prevent COVID-19 infection. The main products used to prevent infection were vitamins, NSAIDs, and herbal products. It is concluded that, in 2021, a significant percentage of university students in northeastern Mexico reported self-medication to prevent COVID-19 infection.

Introduction

The coronavirus disease 2019 (COVID-19) pandemic has provoked an enormous impact around the world (Ali, 2020) and Mexico has been one of the most affected countries; in fact, the true impact in Mexico has probably been underestimated (Ibarra-Nava *et al.*, 2020). Several risk factors associated with severity and mortality of the disease have been reported in the literature. Among them are age >55 years, multiple pre-existing comorbidities, hypoxia. Specific computed tomography findings are indicative of extensive lung involvement, and diverse laboratory test abnormalities and biomarkers of end-organ dysfunction are present (Gallo-Marin *et al.*, 2021).

Until now, the US Food and Drug administration (FDA) has authorized the antiviral drug remdesivir and two combinations of monoclonal antibodies for emergency use in certain patients. In addition, several vaccines are available, three of which (Pfizer-BioNTech, Moderna and Johnson & Johnson) have been approved by the FDA. Furthermore, baricitinib has been approved in Japan (Mouffak *et al.*, 2021). Despite available drugs, therapeutics for the prevention and treatment of COVID-19 are still in great need.

Fear, anxiety and even paranoia can proliferate during a pandemic, all of which can lead to emotional and less than rational responses, such as self-medication (Freckelton, 2020). In addition of these, the 'infodemic', which refers to an excess of information (both true and false) that makes it difficult for people to access reliable sources and obtain valid guidance when it becomes most necessary for decision-making (Garcia-Saisó *et al.*, 2021), could contribute to self-medication with medicinal drugs or other products that have no confirmed efficacy, worsening the situation (OPS, 2020).

Considering the risks that implied in self-medication, the objective of this study was to determine the prevalence of self-medication for the prevention of COVID19 in a sample of university students of northeast Mexico during 2021.

Methods

An anonymous survey composed of two sections was used: the first section collects information regarding age and gender; the second section collects information through open questions about the use of preventive treatments, type of treatment used, whether a relative has used preventive treatments and, other aspects about COVID self-prescription. The data of the survey are available as a supplementary file at https://doi.org/10.6084/m9.figshare.20205353.v1.

Due to COVID19 pandemic restrictions throughout Mexico, a convenience sampling was performed; the survey was applied online and was available for three months in the FORMS platform from February to April 2021. Students from the Universidad Autónoma de Nuevo León were invited through the social networks Facebook and Instagram. Responses were grouped by gender and the differences was tested with the chi-square test. A p-value <0.05 was considered significant. The data that support the

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AUTOMEDICACIÓN PARA LA PREVENCIÓN DEL COVID-19 EN ESTUDIANTES UNIVERSITARIOS DEL NORESTE DE MÉXICO

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RESUMEN

La pandemia del COVID-19 a provocado un enorme impacto en el mundo. El objetivo de este estudio fue determinar la prevalencia de automedicación para prevenir el COVID-19 en una muestra de estudiantes universitarios del noreste de México. Se utilizo una encuesta electrónica compuesta de dos secciones, la primera sección recolecta información sociodemográfica y la segunda información relacionada a la automedicación para la prevención del COVID-19. Un total de 284 estudiantes respondieron la encuesta, 26% reportaron automedicarse con la intención de prevenir y 34,5% reportaron tener un familiar que se ha automedicado para prevenir la infección por COVID-19. Los principales productos utilizados para prevenir la infección fueron vitaminas, AINES, y productos herbales. Se concluye que, en el 2021, un importante porcentaje de estudiantes universitarios del noreste de México reportaron automedicarse para prevenir la infección por COVID-19.

AUTOMEDICAÇÃO PARA A PREVENÇÃO DO COVID-19 EM ESTUDANTES UNIVERSITÁRIOS DO NORDESTE DO MÉXICO

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RESUMO

A pandemia da COVID-19 provocou um enorme impacto no mundo. O objetivo de este estudo foi determinar a prevalência de automedicação para prevenir COVID-19 em uma amostra de estudantes universitários do nordeste do México. Foi utilizado um questionário eletrônico composto de duas seções, a primeira seção recolhe dados sociodemográficos e a segunda recolhe informação relacionada à automedicação para a prevenção da COVID-19. Um total de 284 estudantes responderam o questionário, 26% relataram automedicar-se com o intuito de prevenção e 34,5% relataram ter um familiar que se automedicou para prevenir a infecção por COVID-19. Os principais produtos utilizados para prevenir a infecção foram vitaminas, AINEs, e produtos a base de ervas. Conclui-se que, em 2021, uma importante porcentagem de estudantes universitários do nordeste do México relatou automedicação para prevenir a infecção por COVID-19.

findings of this study are available at https://figshare.com/articles/dataset/Data_Self-prescription_for_covid_prevention_Mexico_ 2021/16799773.

Results

A total of 284 students completed the survey; 66% of them correspond to females. (Table I). Twenty percent of all individuals reported to self-medicate with the intention of preventing COVID19. In this respect, there was no significant difference by gender (22.5% vs 16.5% for females and males respectively; p= 0.24). On the other hand, 34.5% of participants reported having a family member that used preventive treatment for COVID19; no significant difference was observed by gender (p= 0.13).

Among those who reported self-medication, the main products reported as a preventive treatment for COVID19 were: vitamins (mainly C and D) 53.9%, medicinal drugs (mainly paracetamol/AINES) 17.1%, herbal products 10.5%, other unspecified 7.9%, alcoholic beverage 6.6% and, chlorine dioxide 3.9%. This pattern was observed in both genders and no significant differences were observed between them (Table II).

Discussion

Self-medication for COVID-19 has been the object of few studies, with a prevalence ranging from <4% to 88% in the general population; this high variability could reflex specific factors of each country which merit more research (Quicho-Lopez *et al*., 2021). In this work, the prevalence of self-medication in students of UANL, for prevention of COVID19 was higher (23%) than reported for the general population of other countries,

TABLE I
SELF-MEDICATION FOR PREVENTION OF COVID-19 INFECTION

Variable	N	% of self-reported use of preventive treatment		% with a family member who used preventive treatment	
		Yes	No	Yes	No
Total	284	20.4	79.6	34.9	65.1
Gender					
male	97	16.5	83.5	28.9	71.1
female	187	22.5	77.5	38.0	62.0
P value		0.24		0.13	

TABLE II
MAIN PRODUCTS USED BY GENDER

Main product used	Total	Male	Female
Herbal (N=8)	10.5	8.7	11.3
Medicinal Drugs (N=13)	17.1	21.7	15.1
Vitamins (N=41)	53.9	39.1	60.4
Alcohol (N=5)	6.6	13.0	3.8
Chlorine dioxide(N=3)	3.9	0.0	5.7
Others (N=6)	7.9	17.4	3.8
Total (N=76)	100.0	100.0	100.0

such as Poland, Saudi Arabia, and India, where the prevalence was 11.3% (Makowska *et al*, 2020), 22.1% (Alyami *et al*., 2020), and 16.3% (Azhar *et al*., 2021), respectively. Several factors reported in the literature could be responsible for the high prevalence found in this study, such as long waiting time in healthcare facilities, difficulty in obtaining physicians' appointments, an insufficient amount of available beds/space in healthcare facilities, insufficient stock of essential medicines, and delay in attention (Parulekar *et al*., 2016). In addition, the fear and fake news misinformation regarding treatments and miracle cures on the web and social networks also could have contributed to this result (OPS, 2020).

Concerning the most common products used for the prevention of COVID-19 (vitamins 53.9%), similar results have been reported in the general population of Saudi Arabia (Alyami *et al*., 2020) and Bangladesh (Ahmed *et al*., 2020). On the other hand, medicinal drugs such as acetaminophen and NSAIDs, which were the second most common in this study, have been reported in the literature to be self-medicated mainly for COVID-19 symptomatic treatment of fever (Ahmed *et al*., 2020) not for prevention of the infection. Herbal products also have been found to be self-medicated for the prevention or treatment of COVID-19 in other studies (Villena-Tejada *et al*., 2021).

Considering that the population studied has a high education level, the use of chlorine dioxide (3.9%) as a preventive product for COVID-19 is worrying. It is possible that their use is higher in less educated individuals and, the general population of Peru has been reported its use in 8% of individuals (Soriano-Moreno *et al*., 2021). This compound is not safe for humans, due to its observed thyroid suppression, DNA damage and neurotoxicity in several animal models; alarmingly, it has been consumed to treat COVID-19 in many Latin-American countries, including Mexico (Mostajo-Radji, 2021).

Although responsible self-medication could empower individuals to take control of their wellness in general, it could produce other undesirable consequences such as polypharmacy, adverse effects, drug interactions, antibiotic resistance, incorrect diagnosis and, increased drug expenses (Malik *et al*., 2020)

To face self-medication implies combating misinformation by academics and authorities at all levels, since it is a potential source for the use of miracle cures. In addition to this, in the case of Mexico and other developing countries, the empowerment of community pharmacist's role should be promoted by health authorities, since they could contribute to combating misinformation and irresponsible self-medication.

Conclusion

In the year 2021, an important percentage of students of the Universidad Autonoma de Nuevo León, Mexico. reports to have self-medicated to prevent COVID-19. The main product used was vitamins.

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