

Self-medication in Times of COVID-19 Pandemic in Medical Technology Students of the National University of May or San Marcos

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Abstract

Objectives: To explain how self-medication is in medical technology students of the national university of San Marcos in times of COVID-19 pandemic.

Materials and methods: Descriptive, cross sectional study, with a quantitative approach, in medical technology students from the national university of San Marcos. A virtual form was carried out where the variables of socio educational characteristics, level of knowledge about self-medication, practice of self-medication, influential factors and self-medication in the face of the COVID-19 pandemic were collected.

Results: Of the 226 students, 91.15% had self-medicated, with the female sex being the predominant. 56.6% self-medicated because the reason was not so serious. 60.6% of students had a family member or acquaintance who self-medicated to counteract or prevent COVID-19. Of the 97 students who claimed to have presented some symptom such as fever, nasal congestion, sore throat, dry cough, loss of taste or smell, 58.8% said they had self-medicated to counteract any of these symptoms.

Conclusions: A high prevalence of self-medication was found in students even in times of pandemic in both students and close relatives.

Keywords: Self-medication; Pandemic; COVID-19; World Health Organization (WHO); Traditional Chinese Medicine (TCM)

self-medication has been a common practice that can cause unfavorable events unknown to people who perform it such as antimicrobial resistance, drug dependence, adverse effects, lack of effectiveness, intoxication and among many other things [1]. In the context of the COVID-19 pandemic, in Peru the first case of a patient infected with SARS-CoV-2 was registered on March 6, 2020, for which a week later, our country declared a state of national emergency that implied rules to follow and a panic in the population without knowing what we were facing. As time went on, the peruvian ministry of health recommended the use of certain medications for the possible treatment of people with COVID-19 infection after a medical evaluation [2]. However, the pandemic led many people to choose to self-medicate because of fear and uncertainty about the delay in the appearance of an effective vaccine, thus causing the self-administration of substances ranging from disinfectants to medicines. In this way, the World Health Organization (WHO) advised against the use of these drugs disclosed for the treatment of COVID-19, raised even by world leaders and political representatives. The dissemination of medicines, that is, the dissemination of harmful information behaves like an epidemic in itself, so the WHO calls it "infodemic" and causes an impact on the population in the way of thinking and acting which would have an impact on self-medication in times of pandemic; however, the problem of self-medication occurred long before the pandemic; however, it is currently a notable problem due to the constant search for a drug that serves as a treatment or prevention for COVID-19, causing the predisposition of the population to accept a new drug to counteract the problem [3]. For this reason, this study aims to investigate how self-medication is in times of COVID-19 pandemic in a population of students from the national university of San Marcos of the school of medical technology.

International focus: Self-medication is, although it may not seem like it, one of the most common ways to maintain health by treating signs and symptoms by accessing over the counter medications in pharmacies or apothecaries, none without the need to attend or have the diagnosis of a health professional. Over the counter medicines make up 40% of the medicines consumed, if we take the United States as an example [4,5]. This

Introduction

Problem statement

Self-medication is the use of medications by the person's own determination without consulting the doctor and not letting him be part of the diagnosis neither of the disease, nor in the prescription or supervision of treatment. Thus, for many years

practice is a somewhat controversial issue because there are those who support it because, from their position, it is not always necessary to attend a medical center in case of mild illnesses such as a cold or minor ailments, in addition to optimizing medical care by reducing the number of patients in an emergency room; on the other hand, there are those who categorically reject it due to a list of consequences that are among the main causes of deaths worldwide [6]. It is even estimated that in the United States 4.7% of total hospitalizations per year are due to the adverse effects of the consumption of medicines without a prescription and approximately 100,000 deaths per year would be attributable to negative effects to drugs. However, in some developed countries this practice is promoted through some policies and standards in which self-prescription is used as a method that improves the quality of medical service, this is supported by the Tokyo declaration of 1993 in which it is established that this behavior can occur through pharmaceutical care. The latter must be suitable and provided by trained personnel who provide reliable information about the medicinal product.

Self-medication can occur in any social group and some factors that influence the orientation towards this practice the pressure exerted by the group or by relatives, lack of time and/or money to go to a medical consultation, unemployment, poor living conditions, low economic income, lack of access to health services or education in the subject, advertising, loss of credibility in the health sector, among others [7]. In the case of self-medication in university students we can say that it also has a high frequency. These usually consume medications to reduce symptoms of migraine, headaches or stomach discomfort associated with stress conditions experienced during the development of an academic cycle; and, in the case of women, they usually self-medicate for situations related to diets or contraception. We must also bear in mind that young university students have easy access to the internet to search for information related to the drug they plan to consume. This can give positive or negative results [8]. The first scenario because it shows some interest on your part before taking something that could be harmful to your health and also inform about the dosages, contraindications and adverse effects of the drug. In the second scenario we have the disadvantage of any information provided on the internet: It can be false and instead of generating a benefit or relief from pain it can give way to allergic reactions or even death.

National focus: In Peru, the practice of self-medication is also very common. This is due to multiple factors such as the fear of attending hospitals due to personal problems, false advertising in the media or even rumors among acquaintances when any medication calmed their pain and, by mistake, they assume that this was the cause of the momentary relief to their discomfort [9].

For these and other reasons, self-medication can be considered a public health problem because of all the risks it brings, despite the fact that it has tried to raise awareness among the population with campaigns, promotions and even laws.

The socioeconomic level also influences this practice, the population that is in the interior of the country shows higher levels of consumption than those who live in the city, however, the difference is not exaggerated. In provinces such as Cajamarca and Chiclayo, several studies have shown that the degree of education is also an important factor at the time of the decision to self-medicate, with people with low levels being more likely to trust the false information that anyone gives them [10].

The curious thing about this situation is that, at the national level, young university students ranging from 18 to 24 years old show high percentages of self-medication despite the fact that their level of education is high and they have easy access to information about the risks of this bad practice.

During the COVID-19 pandemic, the national health system was caught off guard by a situation of such magnitude and self-medication came to the fore again as people associated their initial symptoms with a strong flu and tried to solve them with prescription pills in pharmacies and apothecaries [11].

In this context, it can be noted that also university students, and more those who study careers related to health sciences, self-medicated with various analgesics or antibiotics since they consider they have sufficient knowledge to do so [12]. However, although it is clearly known that in some cases these young people show side effects to this consumption, they usually downplay the importance due to the consequences caused by this bad practice due to the main fear of attending hospitals and being able to aggravate their health situation. In addition, they are usually compared with other people who, if they found self-medication and justify their actions in this way, without realizing that not all organisms react the same.

Formulation of the problem

How is self-medication in medical technology students at the national university of San Marcos in times of COVID-19 pandemic?

Justification

Methodological justification: The present study will be carried out with the support of a data collection sheet to collect the necessary information based on our objectives hoping to help future research [13].

Practical justification: The level of analysis and relationship that exists in various studies is key points that allow the strengthening of the knowledge that is given in practice, that is, the sum of findings, research studies and bibliographic reviews given in learning, it is for that reason that the present study is of utmost importance for the contribution within the bibliographic reviews.

Social justification

The study will contribute to expanding knowledge about the practice of self-medication in the face of the COVID-19 pandemic by evaluating which situations cause self-medication, the influencing factors and some general provisions on self-medication, being a great contribution to the awareness of the population.

Objectives

General objective: Explain how self-medication is in medical technology students of the national university of San Marcos in times of COVID-19 pandemic.

Specific objectives

- To determine the prevalence of self-medication according to sex variables and educational characteristics in medical technology students from the national university of San Marcos.
- To determine the level of knowledge about self-medication in medical technology students of the national university of San Marcos.
- Identify the practice of self-medication in medical technology students of the national university of San Marcos in times of COVID-19 pandemic.
- Analyze self-medication in the face of the COVID-19 pandemic in medical technology students at the national university of San Marcos in times of the COVID-19 pandemic [14].

State of Knowledge

Background

International background: Ochonga, David; Omwoyo, Joshua and Nyamamba, Duke developed an article entitled "Assessing the prevalence of self-medication among healthcare workers before and during the 2019 SARS-CoV-2 (COVID-19) pandemic in Kenya" that aims to assess the prevalence of self-medication before and during the outbreak of the COVID-19 pandemic in health workers, for this purpose a type of stratified sampling was used where 379 workers were selected to develop the questionnaire in line prepared by the authors and validated by expert judgment [15]. Therefore, for data collection, descriptive and inferential statistics were used presenting tables, graphs, percentages and tabulation; multivariate logistic regression was also used to determine the factors that influence an individual's desire to self-medicate and the associations were considered significant in $p < 0.05$. Thus, the overall prevalence of self-medication increased from 36.2% ($n=137$) before the pandemic to 60.4% ($n=229$) during the pandemic and multivariable logistic regression analyses showed that participants who performed physical activities, worked during the day and were healthy were less likely to self-medicate [16]. That said, it was concluded that self-medication is a very important health problem that has become more relevant in the COVID-19 pandemic, so awareness and awareness must be created to reduce these practices in health workers.

AlHanouf, Ahmed and Shabihul, Sayed, in 2020, published an article entitled "Self-medication practice with analgesics (NSAIDs and Acetaminophen), and antibiotics among nursing undergraduates in university college Farasan Island, Jazan university, KSA" which aims to provide data on the practice of self-medication with analgesics and antibiotics among nursing students at Farasan university [17]. To carry it out, they developed this descriptive and cross sectional study with a sample of 177 participants who were part of the study between December 2019 and February 2020 through a questionnaire. As part of the methodology, the analysis of the data was given through the origin software and the significance was considered in $p < 0.05$. The estimated results were high with respect to the practice of self-medication, with acetaminophen being the most used drug for analgesic purposes without a prescription. Among NSAIDs, ibuprofen was the most preferred for various analgesic purposes, followed by Diclofenac and Meloxicam. On the other hand, azithromycin was the only antibiotic used by the participants and as part of the most common causes of self-medication were headache (45%), menstrual pain (23%) and fever (14%) [18]. The main reason for self-medication was the lack of time to consult the doctor (68%). In addition, self-medication was significantly associated with the year of study. Finally, it was concluded that the results generate concern for the general well being of future nurses and we want to implement educational actions through training programs that limit this practice of self-medication in students.

The observatory of self-medication behavior of the Rosario university and its role in the covid-19 pandemic, article written by A. Calderon, F. Soler, A. Pérez; who after carrying out a series of investigations intend to promote responsible self-medication, prevent self-medication that puts physical and mental health at risk, especially in these times, that we face COVID-19, a disease that still does not have an effective therapy or a way to prevent it, in the face of this the population has instinctively forced itself to self-medicate [19]."

Zelalem T, et al. developed an article entitled "self-medication among medical and nonmedical students at the university of Gondar, Northwest Ethiopia: A cross-sectional study", which is a cross-sectional study, in which a semi-structured questionnaire was conducted to collect data on self-medication in medical and non-medical students, with the aim of comparing the practice of self-medication in these two groups [20]. It was found that the prevalence of self-medication was higher in non-medical students, the most frequent reason why they incur self-medication was because they knew the treatment of the disease, analgesics and antipyretics were the most common categories, headache was the predominant ailment for which the drugs were used. While it is true that self-medication can be useful or harmful to the health of the person, this will depend on factors such as the medication used, the type of disease, the source of the medication and the level of professional knowledge. There could be a difference between medical and non-medical students regarding the level of awareness about issues related to self-medication. Although the practice of self-medication is common in medical students, the high prevalence of self-medication prevailed in the group of non-medical students [21].

Lovo J published a paper called "COVID-19: risks of medication without evidence" that aims to argue the need for evidence in drugs offered for the management and prevention of COVID-19. Due to the crisis generated by SARS-CoV-2, deep ethical dilemmas have been generated since this new virus spread very quickly throughout the world or and until the day of publication of the article there was no fully demonstrated efficacy of some drugs used for treatment, so many people have offered treatments ill considered effective because the population receives treatment based on a suspected clinical without scientific corroboration [22]. Thus, it is concluded that there is no evidence of a drug for COVID-19, nor is there any drug that can be used as a prophylaxis, what can be managed is the control of symptoms, however, we must be judicious of the drugs and rely on the best possible information. Evidence based medicine needs to test the effectiveness of medications, so it is best to wait until you have adequate drug information before you can self-medicate with it.

National background: Sotomayor, Marlit and de la cruz, Jhony, in 2017, published an article entitled "prevalence and factors associated with self-medication in medical students", where it was aimed to conduct a review of articles published between 2011 and 2017 in sources such as PubMed, Elsevier and Google Scholar. Therefore, as part of the results it was obtained that in 10 articles a prevalence greater than 50% was found and of all of them, the highest value was 97.8%, it was also evidenced that the female sex is the one that most self-medicates as well as the students of the 3rd year of medicine with a significant p of 0.01 [23]. This study concludes that the most frequent cause of self-medication is that these students do not have such serious symptoms so they do not believe it necessary to go to a medical visit, therefore, these students should be made aware of the consequences of this bad practice.

Likewise, Miñan A, et al., in the year, 2020, carried out an article whose title is "factors associated with self-medication with drugs related to COVID-19 in health sciences students of a Peruvian city" and whose purpose is to determine the factors associated with self-medication with drugs related to COVID-19 in students of health sciences [24]. To do this, it was an observational, analytical and cross-sectional study so that through a virtual questionnaire socio educational variables, practices, characteristics of self-medication and exposure to COVID-19 were collected, as part of the results it was obtained that of the 718 students, 51.3% had self-medicated, 62.2% self-medicated for presenting two or more respiratory symptoms, the most used drugs being antipyretics, analgesics and corticosteroids. In addition, there was a higher frequency of self-medication in students who have a romantic partner, are in a particular university, family influence and in those who were tested for COVID-19 [25]. It was concluded that there is a high prevalence of self-medication in health science students and depends on the aforementioned factors, thus requiring sufficient information to be promoted for the rational use of medicines.

Tejada S and Medina D, in a letter to the editor entitled "self-medication promoted by the media, a danger with consequences in times of public health crisis due to COVID-19",

recognize that self-medication before the pandemic was a worrying fact due to its irresponsible use, but in these times of pandemic, the number of people who practice this end has increased irrationally, because there is the dissemination of false information, which spreads quickly through social networks and little published scientific evidence. A clear example of disinformation in the midst of the pandemic was promoted by presidents such as Donald Trump and Jair Bolsonaro after spreading false information about hydroxychloroquine on social networks and ensuring that it is an effective treatment for COVID-19 [26]. This article also mentions the role of television programmers in encouraging the use of prednisone and warfarin as a possible treatment, ivermectin and hydroxychloroquine as prevention, without having any scientific evidence. It is thus concluded that the spread of misinformation by various media about drugs and other substances, have not shown efficacy to date, this affects the way of thinking of the population and causes confusion, thus leading many people to put their health at risk, through self-medication.

Theoretical bases

Self-medication: The World Health Organization (WHO) defines self-medication as the selection and use of medications by people, with the purpose of preventing, relieving or treating symptoms of mild diseases that they themselves can identify. Responsible self-medication is possible, although many times people do not have enough information to make good decisions about their health. That is why it is advisable to always consult with a doctor before consuming any type of medicine [27]. The definition of self-medication in the framework of the joint declaration by the international pharmaceutical federation and the world responsible self-medication industry arises from the definition of self-medication as "the use of medicines, without a prescription, on people's own initiative". Pharmacists play a key role in providing assistance, advice and information. Self-medication will represent an important part of self-care and should be taken into account both for its frequency and its repercussions on health, since they can have positive or negative effects.

Self-care: Self-care is defined as the actions that people assume for the benefit of their own health, without formal medical supervision, are the practices of individuals and families through which positive health behaviors are promoted to prevent diseases. Orem defines it as the responsibility that an individual has for the promotion, conservation and care of their own health, it is the set of intentional actions that the person performs or would perform to control internal or external factors, which can compromise their life and subsequent development [28]. It is a behavior that appears in concrete situations of life, and that the individual directs towards himself or towards the environment to regulate the factors that affect his own development and activity for the benefit of life, health and well-being. For this, it requires knowledge, skill and motivation, which can be developed throughout life and with the support of health personnel, that is, the self-care activity must be acquired by mature people, or those who are maturing, which will allow them to know and cover their continuous needs with deliberate and intentional actions, to regulate their own

functioning and human development. Likewise, the WHO in its strategic line of "Health for all in the year 2000" considers "responsible self-care" as one of the main axes for the promotion of health since it encompasses self-medication, self-treatment and first aid.

Responsible self-medication: The organization Mundial of the Salud sees responsible self-medication as a valid formula of health care in developed societies, is understood as "the will and capacity of people or patients to participate intelligently and autonomously in decisions and in the management of preventive activities, diagnostic and therapeutic that concern them. For responsible self-medication it is necessary to make an important effort in the formation of the population, in terms of the management of their health. Nowadays advertising plays an important role, because its objective is to favor the unlimited consumption of all types of products, without reflecting on the possible impacts or prejudices [29]. The "pill culture" has been fostered, where medicines are used in ways that respond to an inordinate belief in their powers, rather than to their health purpose.

Causes or factors that influence self-medication: The main cause of self-medication lies in the need of humans to survive to combat some health problem, in the face of this need, in many cases it is left influenced either by family, friends, social networks or the advertising that we see daily on television or in the streets.

According to Minan Tapia. A, the factors associated with self-medication in some students were their sentimental situation, because those who presented a partner had a high prevalence of self-medication, this due to their social support and their high influence for health practices. It was also identified that most parents had a high prevalence of self-medication, which influenced their family to follow this practice frequently.

Consequences of self-medication: One of the many consequences that come with performing the practice of self-medication constantly and without any control is that the person can develop antibacterial resistance due to the constant consumption of drugs that lose their long term effect. According to the WHO, antibiotic resistance is defined as "the resistance of a microorganism to an antimicrobial drug that was originally effective for treating infections caused by it." Although the evolution of resistant strains is a natural phenomenon, certain human actions accelerate their appearance and spread, so the use of antimicrobial drugs is requested only when prescribed by a doctor.

Medicines policy in Peru: Medicines, when used properly, can confer health benefits if accompanied by the provision of safe water, healthy lifestyles, appropriate sanitation, nutrition and the provision of education. Indeed, many drugs save lives or restore health and their use, where appropriate, are seen as a cost effective intervention. The availability of useful medicines supports the health team's interventions and helps build community confidence in health services.

Several reasons support the need for a national medicines policy: Essential medicines constitute a basic component of the full exercise of the human right to health and should therefore

be accessible to all; medicines account for a high percentage of health expenditure, both in health systems and in families; becoming the second item of expenditure in health institutions and the first item of family expenditure on health; the use of medications is one of the most frequent interventions performed by professionals and patients to address health problems; the inappropriate use of medicines has important consequences on the health of users, in the case of antibiotics, the abuse of which can lead to bacterial resistance and consequently the loss of a valuable resource for the treatment of infections; medicines are directly related to health care and therefore their quality must be ensured.

In practice, it is common that the consideration of medicine as an economic good does not always go in the same direction as health priorities, which causes the health of people, in particular the most vulnerable, to be harmed or put at risk, creating a permanent tension between meeting real therapeutic needs and the expansion of the pharmaceutical market. For this reason, medicines must be approached as a public good, seeking a balance with the economic approach to meet the legitimate expectations of producers and distributors. In the event of conflict, the State must first and foremost ensure the protection of the interests of public health.

In 1977, the world health organization published for the first time the model list of essential medicines that could be used as a reference for countries that decided to draw up their national list. The essential medicine is one that meets the following characteristics: They serve to meet the priority health needs of the population, have proven therapeutic efficacy, are acceptably safe, must be available at all times and must be available to the population that needs them.

In Peru, several studies show that a large part of the population has limited access to medicines. This situation is aggravated by the increase in poverty in recent years.

There are several factors that condition access to medicines: Lack of financing, supply problems, insufficient local production capacity, inadequate pharmaceutical legislation, influence of trade agreements, weak citizen awareness in the exercise of their rights, lack of social responsibility of the private sector, deregulation of the market and low purchasing power of the population. Price is a determining factor for access to the medicines that the population needs. The absence of effective regulatory mechanisms on drug prices contributes to inequity in access, with large price differences observed at the public and private sector level.

The health authority must establish the regulations whose compliance guarantees the efficacy, safety and quality of the products that are marketed in the country. Such regulation should influence from the authorization to the dispensing of medicinal products, as part of a health surveillance system. Therefore, manufacturing and marketing companies are responsible for the quality of the medicines they produce and market, so they must comply with good manufacturing, storage and distribution practices.

In Peru, numerous studies account for the irrationality in the use of medicines. The inappropriate prescription and dispensing

conditioned by deficiencies in vocational training, as well as attitudes and behaviors that lead to non-compliance with the rules, make up a scenario that is urgent to modify. Together with these factors, unreported self-medication invades terrains where only professionals should indicate the drug, when appropriate".

Another factor that influences the quality of the prescription, dispensing and use of medicines is the commercial promotion that frequently proposes uses that are not prudent, offers biased and incomplete information and uses persuasion mechanisms, often unethical, among professionals and the general public.

Self-medication in university students of health sciences: A study in Peru determined that the prevalence of self-medication in university students is high at 98.1% since one in two health sciences students had self-medicated with drugs related to COVID-19. However, this value was lower than that found in a research developed in students of nursing, physiotherapy and medicine in Spain, where a prevalence of 90.8% was obtained under the same context. Likewise, in Latin American realities, self-medication prevalences of 88% have been identified in Mexican universities and up to 90% in nursing and medical students from Honduras. These differences could respond to the diverse educational, health and cultural realities between countries and regions of the world. In addition, he has observed that in health science students who practice self-medication, analgesics and antibiotics are the most commonly used groups of drugs. Likewise, various factors have been identified that influence these students to self-medicate such as being older, being in more years of studies and believing that they have more experience and enough information to self-medicate, diagnose themselves and catalog it as a mild pathology since it is important to remember that in the education of the medical area many methods are used pedagogical topologies where they include the pharmacology course within the curricular mesh, which is usually taught in the 3rd year of the university career. According to Rathish D, et al., learning this course consists of the student having knowledge suitable for a rational prescription, so many of them tend to confuse this term and begin to apply self-medication in their lives without first having completed all their undergraduate courses.

COVID-19: SARS-CoV-2 is the virus that generates the COVID-19 disease. Coronaviruses are a family of single stranded RNA viruses that affect species other than humans (camelids, cows, felines, bats), in which they produce respiratory, enteric, hepatic and neurological diseases. The transmission of these strains to humans occurs through direct or indirect contact with animals. They were first described in 1966 by Tyrell and Bynoe, who grew the viruses from patients with common colds. According to their morphology as spherical virions with a central core and surface projections resembling a solar corona, they were called coronaviruses. There are four subfamilies namely and they are alpha, beta, gamma and delta coronavirus. While alpha and beta coronaviruses apparently originate from mammals, particularly bats, gamma and delta viruses originate from pigs and birds. Sequence analysis and relative bias of the use of codons synonymous with known coronaviruses suggest

that SARS-CoV-2 is a recombinant virus from a bat coronavirus and another unknown coronavirus. Recombination between the two virus species occurred at the level of the glycoprotein that recognizes cell surface receptor and the results suggest that some snakes may be the most likely wild reservoir for COVID-19. However, to date, there has been no consistent evidence of coronavirus reservoirs that are not mammals and birds. For this reason, a group of Chinese experts identified an 88% relationship with bats, indicating that mammals are the most predominant link between COVID-19 and humans.

Within this family, seven coronaviruses have been identified that have the ability to infect humans (HCoV) and are: Common human CoV: HCoV-229E and HCoV-NL63 (alphaCoVs); HCoV-OC43 and HCoV-HKU1 (betaCoV lineage A), responsible for about 5 to 10% of common colds. Subgroup of β -coronavirus (severe epidemic cases): MERS-CoV, SARS-CoV, is mainly found in bats, in addition, it could cause an outbreak of disease in the future and the current SARS-CoV-2. Beta coronaviruses can cause serious illness and death, while alpha-coronaviruses cause asymptomatic or mildly symptomatic infections. Most infections caused by coronavirus in humans are mild, but two beta coronaviruses, SARS-CoV and MERS-CoV led to more than 10,000 cases in the last two decades, with a mortality rate of 10% in the case of SARS-CoV and 37% in the case of MERS-CoV"

SARS-CoV-2 comparte seven non-structural proteins with sars-CoV virus (82% nucleotide identity). It is currently described that this virus uses the same mechanism used by SARS-CoV to penetrate the cells, through the receptor of the enzyme converting enzyme of angiotensin II (ACE2).

A few years ago in humans emerged SARS-CoV which is responsible for the SARS outbreak of 2002–2003 and MERS-CoV which since 2015 has been responsible for the continuous outbreak of MERS largely focused on the Arabian Peninsula. However, it is also evident that SARS-CoV-2 is more infectious than SARS-CoV and MERS-CoV and those individuals can transmit the virus when asymptomatic or pre-symptomatic. On February 11, 2020, the coronavirus study group of the international committee on taxonomy of viruses finally designated it as SARS coronavirus 2 based on phylogeny, taxonomy and established practice as it was previously called 2019-nCoV. Previously, in January of this year, the WHO named the disease caused by this coronavirus as COVID-19. Accordingly, this same organization made an ongoing assessment of this outbreak and was concerned both about the alarming levels of spread and severity, and about the alarming levels of inaction of the disease. For these reasons, they came to the conclusion that COVID-19 should be considered a pandemic.

In addition, the genetic form of SARS-CoV-2 has been studied, which is wrapped in a lipid bilayer derived from the membrane of the host cell and consists of four structural proteins that are the Spike protein (S), Membrane (M), Envelope (E) and Nucleocapsid (N), in addition to a hemagglutinin esterase. Protein S is a strongly glycosylated protein that forms homotrimeric tips on the surface of the viral particle and is responsible for the entry of the virus into host cells. This protein is made up of two subunits: S1 and S2, which cleave inside the endocytic vesicles during the entry of the virus. The M protein is

primarily responsible for its shape and the most abundant in the viral structure, while E is found in small amounts and is responsible for the release of viral particles from host cells. In this way, both proteins form the assembly of the virus and the formation of mature viral envelopes. The N protein is found in the nucleus interacting with viral RNA and shapes the nucleocapsid so it is necessary for the packaging of viral RNA during assembly. Hemagglutinin Esterase (HE) is a protein present on the surface of some coronaviruses, such as SARS-CoV-2. The characteristics of HE could potentiate the entry into host cells and the pathogenesis of coronaviruses. For the virus to enter host cells, the obligate receptor domain of the S₁ subunit of the S protein is required to act as a mediator in binding the virus to cellular receptors, while the S₂ subunit is the mediator of fusion events between the viral and cellular membrane. SARS-CoV-2, as for SARSCoV-1, the receptor is ACE2 present in the cells of the lower respiratory tract. The S protein on the surface of the virus is the one that binds to this ACE2 receptor, being a critical point for the entry of the virus into the cells. The affinity of SARSCoV-2 for the ECA2 receptor is even greater than that of SARSCoV-1. Cathepsin L is one of the proteases responsible for the cleavage of these subunits after binding to the cell receptor and during the entry of the virus into endosomes. SARS-CoV-2 also has an additional cleavage point for a furin like protease, suggesting that furin cleavage occurs during viral output from the host cell. Some *in vitro* experiments showed that cathepsin L inhibitors could inhibit infection with SARS-CoV-1, as well as other viruses that rely on cathepsin L for admission. The presence of an excision site for cathepsin L in SARS-CoV-2 opens up the possibility that inhibitors of this protease are useful in inhibiting infection with this virus.

The Chinese authorities decided to propose 3 main routes and they are:

- When an infected person coughs or sneezes, they are ingested or inhaled by nearby individuals.
- It can occur when a subject touches a surface or object contaminated with the virus and subsequently touches their mouth, nose or eyes.
- It can occur when respiratory droplets mix in the air, in the form of aerosols, and can cause infection when a high dose of aerosols is inhaled in a relatively enclosed environment.

One study also indicated the digestive system as a potential route of transmission, given that some patients had abdominal discomfort; the ACE2 receptor was found to be highly expressed in ileum and colon enterocytes.

The Chinese code in charge of the control and prevention of diseases said that 1 to 2 men were infected for every woman. It is speculated that the low susceptibility of women to viral infections may be due to the protection of the "external" X chromosome they have compared to men. On the other hand, children comprise a peculiar population that has a different immune system than adults, so the transmission of the virus through their mothers with suspected or confirmed infection occurs easily.

When infected a person by any route of transmission may present symptoms and signs, where their clinical manifestations

usually appear after an incubation period of approximately 5.2 days. This period depends on the age and state of the patient's immune system. It was shorter among patients over 70 years of age compared to those younger than that age. In symptomatic patients, clinical manifestations of the disease usually consist of fever, cough, nasal congestion, fatigue and other signs of upper respiratory tract infections. Infection can progress to severe disease with dyspnea and severe chest symptoms corresponding to pneumonia in approximately 75% of patients. Pneumonia occurs mainly in the second or third week of a symptomatic infection and prominent signs of viral pneumonia include decreased oxygen saturation, blood gas emissions and changes visible through X-rays of thorax. Lymphopenia appears to be common and inflammatory markers (C-reactive protein and pro inflammatory cytokines) are elevated.

Based on some studies, patients may initially present with diarrhea and nausea a few days before developing a fever, suggesting that fever is dominant but not the main symptom of infection. A small number of patients may have headache or hemoptysis. Meanwhile, patients may have normal or lower white blood cell counts, lymphopenia, or thrombocytopenia, with a prolonged activated thromboplastin time and a mayor level of C-reactive protein.

Although the symptoms of the disease are very similar to those of SARS and common flu, those of COVID-19 showed upper respiratory tract implications such as rhinorrhea, sneezing and sore throat, but Lee, et al. state that intestinal symptoms such as diarrhea are uncommon. The elderly and those with underlying disorders (hypertension, chronic obstructive pulmonary disease, diabetes, cardiovascular disease), rapidly develop ARDS, septic shock, metabolic acidosis difficult to correct and coagulation dysfunction, conditions that lead to death. Li, et al. they hypothesized that SARS-CoV-2 could have neuroinvasive potential, since viral entry into the central nervous system may partially contribute to the development of respiratory insufficiency in some patients, but it is not yet of much scientific support.

Self-medication in COVID-19

Self-medication practices in pandemic: Traditional Chinese Medicine (TCM) has its own characteristics such as holistic concept, Yin and Yang balance, differentiation and treatment of the syndrome, strengthening the body's resistance to eliminate pathogenic factors. MTC has thousands of years of experience in regulating the body and improving resistance to epidemic diseases, with unique knowledge and experience in prevention and control. For mild and ordinary patients, early intervention of traditional Chinese medicine can effectively prevent the disease from developing into a serious and critical illness. In severe cases, traditional Chinese medicine has gained time to rescue them by improving symptoms. The practice of COVID-19 treatment showed that early intervention of traditional Chinese medicine is an important way to improve the cure rate, shorten the course of the disease, slow the progression of the disease, and reduce the mortality rate. Moreover, the reason why traditional Chinese medicine works is not only to inhibit the virus, but it can also block infection, regulate the immune

response, cut off the inflammatory storm, and promote the body's repair. In addition, COVID-19 prevention and control measures fully reflect the ideology of "preventive treatment of the disease".

The Ministry of Health of Peru (MINSA) issued a total of 88 regulations through ministerial resolution 270/2020-MINSA that was published on May 8 in the context of COVID-19 where chloroquine, hydroxychloroquine, ivermectin and azithromycin were included, but applying their use by supervision of health professionals.

Presumptive treatment: The INS rules out that the use of plants, flowers, or any other product that we usually consume, in the belief that it is good for health, works for the case of this SARS-CoV-2. It is certain that the products that we usually consume to calm certain respiratory, stomach or relaxing discomforts, can indeed generate some relief, but they do not prevent and less cure COVID-19. For example, steam baths can help the fluidity of mucus, relax nerves or cleanse the skin of some impurities, but not for anything else. However, care must be taken because in Peru the vast majority of the population began to acquire these practices by boiling eucalyptus plants, but when done in a closed place carbon monoxide is released that when inhaled affect the nervous system and depending on the time, produce dehydration, lack of oxygen in our organs and generate fatal consequences. In addition, some products that have also been used frequently such as kion, garlic, lemon, or some minerals used to gargle such as baking soda do not have a proven effect in the case of coronavirus, it is more although it has great benefits to combat excess acidity and reflux, if it is applied for COVID-19 where it does not have proven scientific evidence it could generate adverse effects. Less over, the use of strong heats such as dryers in the nasal passages helps to modify the body temperature of humans.

Paracetamol: Dr. Torres states that paracetamol activates 11 of 13 proteins that have an important disruption in the immune system and cause severe inflammation in the respiratory distress of the adult (ARDS) suffered by severe cases of COVID-19, quite the opposite of ibuprofen, which behaves as an inhibitor of the proteins generated by ARDS, since it activates only two and inhibits seven, so caution should be exercised in administering paracetamol to these patients and avoiding high doses. It could increase the chance of a negative synergistic reaction and predispose to severe COVID-19.

Arbidol: It is a drug a direct antiviral effect in the early viral replication of SARS-CoV since it inhibits the fusion, mediated by the virus, with the target membrane, with the consequent blocking of the viral entry to the target cells. One study claimed to be effective in COVID-19 therapy in a concentration range of 10-30 μ M, *in vitro* as in Wang, et al.'s study, arbidol showed a tendency to improve the patient's discharge rate and reduce mortality in a small cohort of COVID-19 patients.

Chloroquine: Chloroquine is used for many years to treat malaria, however, it has now been seen to have great potential for the treatment of COVID-19 as it can inhibit the pH-dependent steps of replication of several viruses with a powerful effect on the infection and spread of SARS-CoV. In addition, this

drug has immunomodulatory effects, which suppress the production/release of TNF- α and IL-6. Chloroquine could also interfere with the proteolytic processing of M protein and alter the assembly and budding of the virion. Finally, in COVID-19, this drug could act indirectly by reducing the production of pro-inflammatory cytokines and/or activating antiviral CD8⁺T cells.

Ibuprofen: The use of ibuprofen and NSAIDs was discouraged due to the alert about the alleged aggravation of COVID-19. This warning was based on a large number of studies reviewed in, including a recent report from the French Pharmacovigilance network conducted in 2019 showing that the use of NSAIDs (even if given for short periods and/or associated with antibiotics) for the treatment of fever and non-rheumatic pain (which may be indicative of an underlying infection) increases the risk of serious bacterial complications, in particular of the lungs, and on the alleged overexpression of the Angiotensin Converting Enzyme 2 (ACE2) induced by ibuprofen. Therefore, with the onset of the SARS-CoV-2 pandemic, the cautionary warning with NSAIDs became important as three months later, a comment from different authors hypothesized that NSAIDs could also increase the risk of thrombosis, Acute Respiratory Distress Syndrome (ARDS), and acute renal failure in COVID-19 patients. However, there is no scientific evidence to support the association between ibuprofen and an increased risk of COVID-19 severity. Thus, another study states that NSAIDs, by virtue of their recognized anti-inflammatory and antiplatelet activities (especially aspirin), could be beneficial both for the early control of inflammation and for the prevention of thromboembolism, thus theoretically limiting the progression of COVID-19 in a bimodal pattern. Ibuprofen, in particular, possesses Nf-kB inhibitory activity that may further help reduce excess inflammation/cytokine release in COVID-19 patients."

Ivermectin: In the late 1970's, ivermectin was developed as a new class of drug to treat parasitic infections. Initially used in veterinary medicine, it was soon discovered to be safe and effective in humans. It has been successfully used to treat onchocerciasis and lymphatic filariasis in millions of people worldwide as part of a global drug donation program. Approximately 3.7 billion doses of ivermectin have been distributed in mass drug administration campaigns globally over the past 30 years. It is also a therapeutic option for viral infections, with data showing some *in vitro* activity against a wide range of viruses, including HIV, dengue, influenza, and Zika virus, likely through inhibition of IMP α/β 1 nuclear import mediated by IMP. With the COVID-19 pandemic, Caly, et al. stated that ivermectin has been shown to have an effect against SARS-CoV-2 in laboratory experiments using monkey cell cultures. Chirinos, et al., however, argued that the concentrations needed to achieve an antiviral effect in these experiments were about 35 to 100 times higher than those used in humans. That is, it is highly unlikely that in COVID-19 patients receiving the doses currently considered safe in humans, the antiviral effect seen in monkey cell experiments will occur. On the other hand, although it is true that the doses of ivermectin currently used in humans are considered safe, it should be noted that this presumption comes from the use of ivermectin in patients who do not reach the level of acute involvement seen in patients with this infection, and who usually do not have

other pre-existing chronic diseases (of the heart, lungs, kidneys, liver, blood, etc.) which are more common in patients with COVID-19.

Azithromycin: Se commonly used for bacterial respiratory infections and could potentially treat or prevent co-infection with SARS-CoV-2. It may also have antiviral activity against some RNA viruses as it has been shown to be effective *in vitro* against viruses such as Zika and rhinovirus, in addition to SARS-CoV-2, and to have antiviral effects on bronchial epithelial cells. In addition, it is immunomodulatory, and can reduce exacerbations of chronic diseases of the respiratory tract. However, there is no scientific evidence that authorizes or supports SARS-CoV-2 as a treatment. For example, Furtego, et, al. report the primary outcomes of coalition II, a randomized open label trial evaluating azithromycin in addition to standard care, which included hydroxychloroquine, compared to standard care alone in hospital admitted patients with severe COVID-19, including patients receiving oxygen supplements at more than 4 L/min, or the use of a high flow nasal cannula or non-invasive or invasive mechanical ventilation. After follow up, they found no benefit of azithromycin on clinical outcomes, including clinical status or mortality, and there is no evidence of an increase in adverse events with the addition of azithromycin.

Hydroxychloroquine: A study suggests that this drug is effective in eliminating the viral nasopharyngeal transport of SARS-CoV-2 in patients with COVID-19 in just three to six days, in most patients. In addition, a significant difference was observed between patients treated with hydroxychloroquine and controls from day 3 after inclusion. Also, a Chinese team published the results of a study showing that chloroquine and hydroxychloroquine inhibit SARS-CoV-2 *in vitro* with hydroxychloroquine as it is much more potent. In addition, hydroxychloroquine differs from chloroquine by the presence of a hydroxyl group. Both drugs are active against malaria and have similar pharmacokinetics, but differ in their toxic doses. The advantage of hydroxychloroquine is that it can be used in high doses for long periods with very good tolerance. Zhou, et al. proposes that hydroxychloroquine shows an antiviral effect very similar to that of chloroquine and could serve as a better therapeutic approach. Hydroxychloroquine is likely to attenuate the severe progression of COVID-19, inhibiting the cytokine storm by suppressing T cell activation. In addition, it has a safer clinical profile and is suitable for pregnant women.

Definition of terms

- The action of administering a medication yourself on advice or prescription.
- The epidemic disease that spreads around several countries or attacks all individuals in a locality or region.
- An extensive family of viruses that can cause disease in both animals and humans. In humans they cause respiratory infections ranging from cold to more serious illnesses such as Severe Syndrome (SARS).
- Infectious disease caused by coronavirus.
- The amount of medication to be administered to produce the desired effect.

- A set of symptoms characteristic of a particular disease or disease. Set of signs or phenomena revealing a generally negative situation.

Materials and Methods

Type of research

The present research is a descriptive, cross sectional study with a quantitative approach.

- Descriptive studies are characterized by being observational; the study factor is not intervened or manipulated. In addition, these studies collect information, and then proceed to describe, classify and find associations of one or more factors related to an event or disease.
- Cross sectional studies facilitate studies of one or more factors associated with an event or disease. Providing information about the frequency and distribution of risk factors and health damage.
- A quantitative approach is one that uses data collection to test a hypothesis and to establish patterns of behavior and test theories based on numerical measurement and statistical analysis.

Poblacion

The population comprises 591 active medical technology students from the national university of San Marcos from first to fifth year.

Sampling

The sample size was calculated based on the total number of active people from the professional school of medical technology belonging to the national university of San Marcos, specializing in: Radiology clinical laboratory and pathological anatomy, physical therapy and rehabilitation, occupational therapy, from which a stratified probabilistic sample was carried out. Which was calculated its size with a confidence level of 95% obtaining a value of 234 students. Stratified probabilistic maestro is one where the maestro is divided to the population in segments and a sample is selected for each segment for this reason our population was divided for each academic year within which it was segmented by each academic area taking in each of them a sample.

Inclusion criteria

- Must be enrolled in the 2020-II academic semester.
- You must be a student of the UNMSM school of medical technology.
- You must voluntarily accept participation in the conduct of the surveys.

Exclusion criteria

- Alumnos who went down from base.
- Students who have dropped out of school.
- Students outside the School of Medical Technology.

Data collection techniques and instruments

A survey was designed as a data collection instrument with 22 questions, the first question corresponding to informed consent, the 3 subsequent questions corresponding to general data: Sex, area and academic cycle.

The next 18 questions were multiple-choice where characteristics were included on the level of knowledge about self-medication, self-medication practice, factors that influence self-medication and self-medication in the face of the COVID-19 pandemic.

Instrument validation: The questions proposed in the questionnaire were a collection and synthesis of several research papers, but we have modified it and adapted it to our reality. Therefore, the instrument was previously applied to subjects with similar characteristics for the study thus forming a pilot test and was then validated by expert judges made up of medical professionals for the qualitative assessment of the degree of relevance and degree of intelligibility of each question of the questionnaire.

Collection plan

The information of the students was collected based on the adaptation of a survey that was used as a basis for the study, said survey was adapted and applied *via* the web for greater ease of study.

The questionnaire was developed through the Google forms application, later the delegates of the different areas of the professional school of medical technology were contacted and through them the link to access the virtual questionnaire was proposed explaining the objective of the study. The questionnaire began with an informed consent, which had to be accepted by the student to continue participating in the study. The data were collected virtually from January 05 to 20, 2021, after which, the questionnaire was closed.

Analysis and interpretation of the results

From our sample of 234 students, 226 students were obtained due to the limited access of some students to be able to answer the virtual questionnaire. The data obtained was exported to

Microsoft Excel v.2013, where a data quality model was developed. The statistical analysis was performed in the SPSS statistical program.

The frequencies and percentages for the variables were described, cross-tabulations were made and graphs were also made to observe the characteristics of some variables. We worked with a confidence level of 0.760 using Cronbach's Alpha considered acceptable.

Results

Of the 226 students of the professional school of medical technology who were surveyed, 60.6% were female, about academic areas 25.7% belong to radiology, 27.9% to clinical laboratory and pathological anatomy, 24.3% to physical therapy and rehabilitation, and 22.1% to occupational therapy. Corresponding to the academic cycle, 23.9% represented the eighth cycle and 1.8% to the seventh cycle. Likewise, 41.2% of students are insured to the SIS, 38.5% are not affiliated with any health insurance and 11.5% are insured in EsSalud. A prevalence of self-medication in medical technology students of 91.15% was obtained.

In the section of level of knowledge about self-medication, of the 226 respondents, 100% knew how to correctly answer the question what is self-medication? That has as a correct answer, use of medicines on your own initiative.

On the RISKS caused by self-medication, we found that 27.9% have knowledge about allergic reactions by medications, 1.9% marked No signs and symptoms, 18.6% marked the risk of Addiction, 32.1% by Intoxication and finally 19.5% marked the risk of death by self-medication.

When performing a bivariate analysis, it was identified that of the 206 students who performed medication without a prescription, there was a higher frequency in female students since 93.4% of them perform self-medication, while 87.6% of them perform such a practice. Finding that with respect to the total (N=206) there is a prevalence of self-medication of 62.14% in female students of the school of medical technology (Table 1 and Figure 1).

Table 1: Prevalence of self-medication by sex.

			Did you ever take medication without a prescription?		Total
			Yes	No	
Sex	Female	Recount	128	9	137
		% within sex	93,4%	6,6%	100,0%
	Male	Recount	78	11	89
		% within sex	87,6%	12,4%	100,0%
	Total	Recount	206	20	226
		% within sex	91,2%	8,8%	100,0%

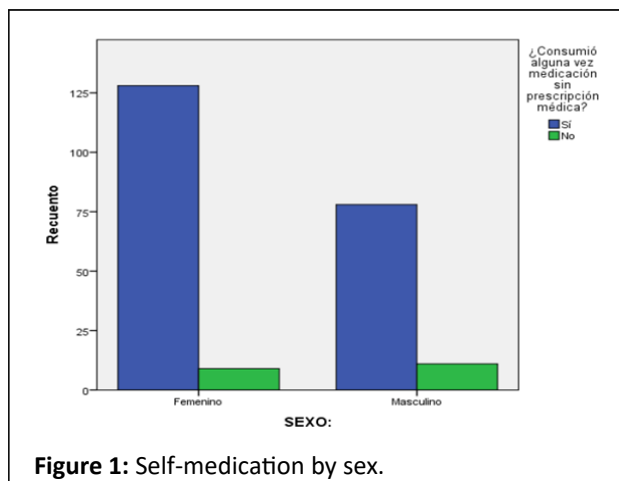


Figure 1: Self-medication by sex.

In the area of radiology, 87.9% of students claimed to have self-medicated at some point in their lives, in clinical laboratory and pathological anatomy, 93.7%, in physical therapy and rehabilitation, 92.7%, and in occupational therapy 90%. Finding a higher prevalence with 28.64% in the laboratory area (Figure 2).

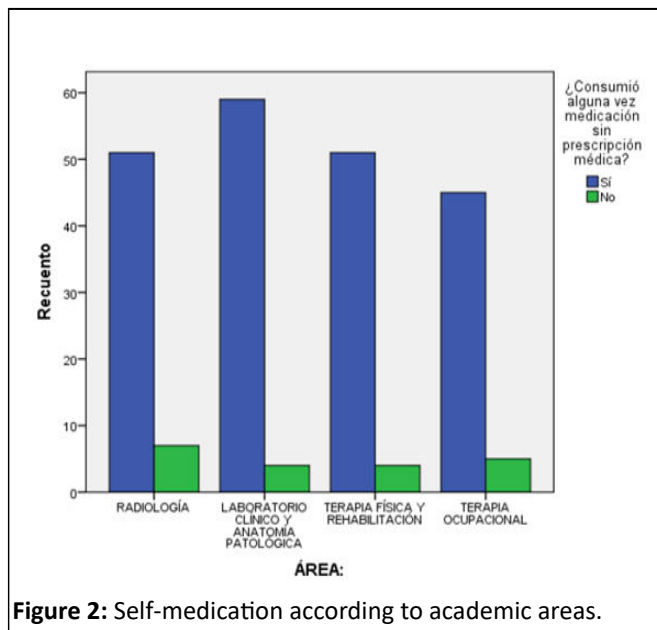


Figure 2: Self-medication according to academic areas.

In the first cycle there were 94.1% of students who claimed to self-medicate at some point in their lives, in the second cycle, 93.5%, in the third cycle 40%, in the fourth cycle 87%, in the fifth cycle 87.5%, in the sixth cycle 98%, in the seventh cycle 100%, in the eighth cycle 92.6% and finally, in the ninth and tenth cycle (boarding school) 81.8%. Of the total number of people who

self-medicated (N=206), a higher prevalence was found in the eighth cycle with 24.27% with response to the rest, but corresponding to the year of study was the third year with 27.18% of people who performed this practice (Figure 3).

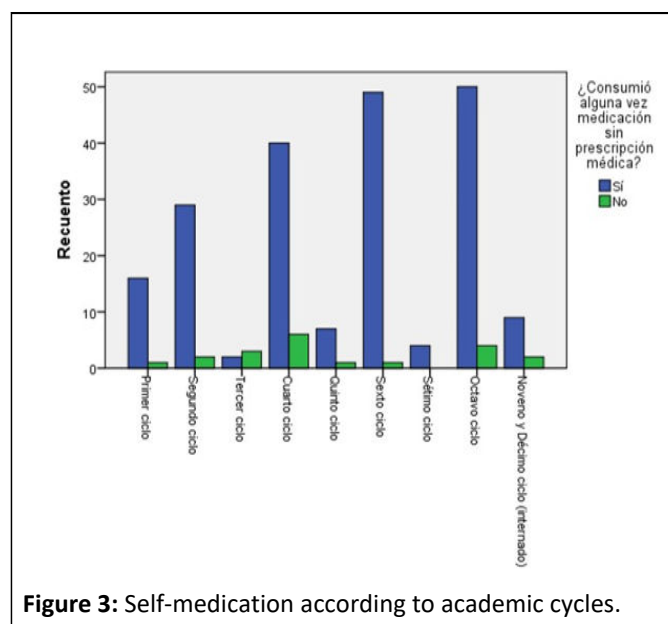


Figure 3: Self-medication according to academic cycles.

Reasons for self-medication in medical technology students:

When performing a descriptive statistical analysis and identified that 56.6% of students self-medicated because the disease was not serious, while 19% of students self-medicated for lack of time to go to a doctor or, 8% claimed to have enough knowledge to prescribe themselves, 2.7% lived very far from the hospital and 0.9% because they could not buy a prescription.

Factors influencing self-medication:

When asked the question around the belief that advertising presented on TV, radio, internet influences self-medication, 94.7% of students said they agreed that they are factors that influence people to self-medicate.

On the other hand, when performing a descriptive frequency analysis it was found that 89.8% of students have friends or family who consume medications without a prescription. Likewise, a cross tabulation was carried out where it was witnessed that of the students who claimed to have friends or family who self-medicate, 93.6% had also claimed to self-medicate at some time (Table 2).

Table 2: Cross tabulation of students who once self-medicated and who in turn have family or friends who self-medicate.

			Did you ever take medication without a prescription?		Total
			Yes	No	
Do you have friends or family members who take over the counter medications?	Yes	Recount	190	13	203
		% within do you have friends or family members who take over the	93,6%	6,4%	100,0%

		counter medications?			
	No	Recount	16	7	23
		% within do you have friends or family members who take over the counter medications?	69,6%	30,4%	100,0%
Total		Recount	206	20	226
		% within do you have friends or family members who take over the counter medications?	91,2%	8,8%	100,0%

On having received information about medicines to counteract or anticipate COVID-19, 77% of students highlighted that they did receive information of that nature, being the Facebook application, the social network where more information about these drugs was aired most frequently with 78.8%; and followed by that, WhatsApp with 13.3%.

By performing a statistical analysis using a cross table, it was possible to compare those students who claimed to receive

some type of information about medications to counteract or predict COVID-19 with the influence closest to them at the time of receiving that information, highlighting social networks (Table 3).

Table 3: Factors influencing the collection of information about medicines to counteract or prevent COVID-19.

		Who provided the information?				Total
		Family members and friends	Social media	Other		
Did you receive any information about medications to counteract or prevent COVID-19?	Yes	Recount	67	79	28	174
		% within did you receive any information about medications to counteract or prevent COVID-19	38,5%	45,4%	16,1%	100,0%
Total		Recount	67	79	28	174
		% within did you receive any information about medications to counteract or prevent COVID-19	38,5%	45,4%	16,1%	100,0%

It was found that 60.6% of students had a family member or acquaintance who self-medicated to counteract or anticipate

COVID-19. On the other hand, of the 97 students who claimed to have presented some symptom such as fever, nasal congestion,

sore throat, dry cough, loss of taste or smell, 58.8% claimed to have self-medicated to counteract any of these symptoms. Among the students who presented symptoms, 76.3% did not go to a health center in the presence of one of these.

A descriptive statistical analysis was carried out using a cross table where it was identified that of the students who self-medicated to counteract some of these symptoms, 80.7% had

claimed to have a family member or acquaintance who had self-medicated to counteract or foresee COVID-19 (Table 4).

Table 4: Cross tabulation of students who self-medicated to counteract any of the symptoms compatible with COVID-19 with the prevalence of having family members or acquaintances who self-medicated to counteract or foresee COVID-19.

			Did any family members or acquaintances self-medicate to counteract or prevent COVID-19		Total
			Yes	No	
Do you have friends or family members who take over-the-counter medications?	Yes	Recount	46	11	57
		% within do you have friends or family members who take over the counter medications?	80,7%	80,7%	100,0%
	No	Recount	27	13	40
		% within do you have friends or family members who take over the counter medications?	67,5%	32,5%	100,0%
Total	Recount		73	24	97
	% within do you have friends or family members who take over the counter medications?		75,3%	24,7%	100,0%

Of the 57 who claimed to have self-medicated for the presence of the aforementioned symptoms, the symptom that most motivated the students to self-medicate was nasal congestion with 28.5% followed by sore throat with 27.8%

(Figure 4). Of the drugs used to counteract any of these symptoms, paracetamol was the most frequent (Figure 5 and Table 5).

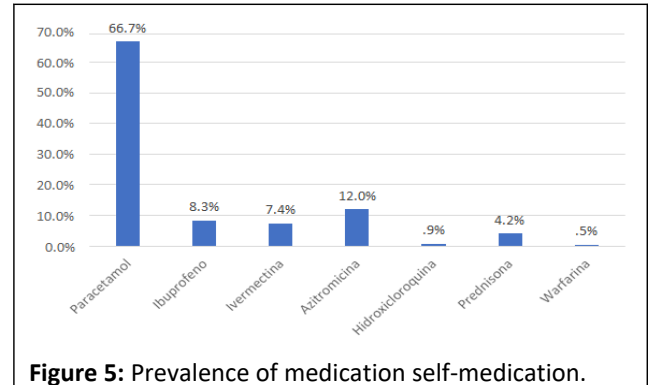
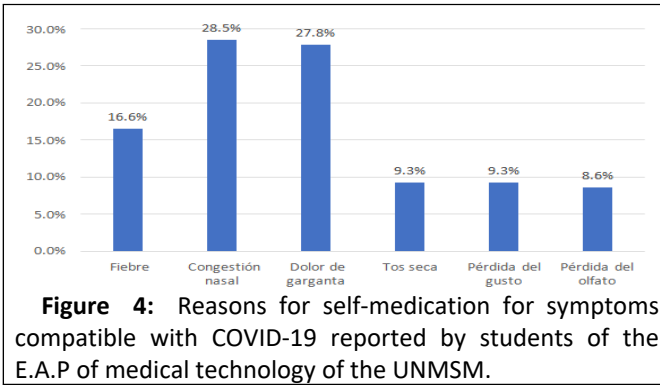


Table 6: Cross tabulation of the effectiveness of the drugs used to counteract any symptom such as: Fever, nasal congestion, sore throat, and dry cough, loss of taste or smell.

			It considers that the efficacy of the self-medicated drugs was			Total drugs
			Good	No	Other symptoms appeared	
Medicines consumed	Paracetamol	Recount	37	2	2	41
		% within \$Medicaments	90,2%	4,9%	4,9%	
	Ibuprofen	Recount	12	0	1	13
		% within \$Medicaments	92,3%	0,0%	7,7%	
	Ivermectin	Recount	13	1	0	14
		% within \$Medicaments	92,9%	7,1%	0,0%	
	Azithromycin	Recount	20	1	1	22
		% within \$Medicaments	90,9%	4,5%	4,5%	
	Hydroxychloroquine	Recount	1	0	1	2
		% within \$Medicaments	50,0%	0,0%	50,0%	
	Prednisone	Recount	9	0	0	9
		% within \$Medicaments	100,0%	0,0%	0,0%	
	Warfarin	Recount	1	0	0	1
		% within \$Medicaments	100,0%	0,0%	0,0%	
Total		Recount	93	4	5	102

It was identified that the place where the students acquired the medicines had greater frequency in the Pharmacy representing 91.2% (Figure 6).

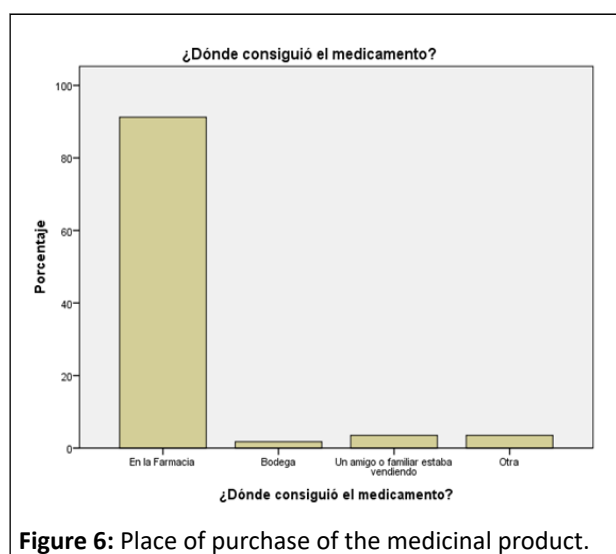


Figure 6: Place of purchase of the medicinal product.

Discussion

Self-medication is a practice very commonly developed by the population and in particular by students who are part of careers related to health, being a constant concern the high prevalence rates that are obtained after evaluating this type of students about performing medication without any medical prescription that validates it. Therefore, taking our background as a reference, Minan Tapia A, et al., argued 81 students belonged to medical technology 49 people claimed to self-medicate, thus finding a prevalence of 60.5% with respect to the other careers that obtained a lower prevalence. Similarly, Zelalem reveals that in its study there is a prevalence of 64.5% corresponding to non-medical students. On the other hand, Faqihi and Sayed present a prevalence of self-medication in nursing students of 87%. However, Sotomayor, M and de la cruz, J stated that the highest prevalence found in medical students was 97.8%, a result that most closely resembles ours where we obtained a prevalence of 91.15%. Although it is not necessarily the same population corresponding to the career, it can be evidenced that they are areas related to health sciences. Likewise, it should be noted that our study reflects that the students of medical technology of the national university of San Marcos have a higher prevalence of self-medication than the students of medical technology of two universities of Tacna as explained by Minan Tapia, A. However, their study shows in the aspect of socio educational characteristics of the participants, that the male sex is the one that most self-medicates (53.1%) and more than half (52.2%) are affiliated to health insurance, as stated by Zelalem where 59.62% of students who self-medicate are male, results that differ from ours where we obtained that 62.14% of women self-medicate, but if we agree with the percentage of people who are affiliated with health insurance since in our study it was 52.7%. About our result in relation to sex and the practice of self-medication, we have agreed with the article developed by Sotomayor and de la Cruz, who after their bibliographic search reached a prevalence of up to 85% in the female sex, emphasizing that it is a result similar to most of the studies investigated in that article. In the same way, they argue that the students of the third year (fifth and sixth cycle) are the ones who self-medicate the most (87.3%), also Zelalem affirms that it is

the students of the third year who obtained the highest percentage of self-medication (40%), these are similar results to our work where it is evidenced that it is the third year students who practice self-medication the most (27.18%). Although it has often been stated that the higher the level of study, the more is the practice of self-medication, since it has been shown that in the students evaluated it was not so, and it is even the final year students who obtained the lowest percentage in doing this practice (4.3%). Given this, we can infer that mid career students have regular knowledge about basic things in medicine, and the higher level of study may reflect having greater criticism and care after the respective analysis of performing practices not only for basic knowledge but taking into consideration various factors and their respective consequences.

Level of knowledge about self-medication

We found that the totals (100%) of the respondents are clear about the concept of self-medication.

In terms of knowledge about the risks of self-medication, we found that a majority has knowledge about cases of drug poisoning, followed by risk of allergic reactions, death, addiction and a minority indicated that there is no risk of presenting signs and symptoms due to self-medication.

Reason for self-medication

It was identified that in most students the main reason for self-medication was because the disease was not serious, because in some cases most resort to a pharmacy to request some medication to treat some symptoms. It was also common that in some students who did not have enough time to go to the doctor, they have the tendency to self-medicate, this related to many factors such as excessive academic work or class hours. Another group of students claimed to have the necessary knowledge to self-medicate, which is important to be able to lead to responsible self-medication. Finally, a minority of students had the difficulty of living far from a hospital and did not have enough economy to buy a prescription, at this point we can find that the economic factor influences the practice of self-medication, given that they opt for a quick solution without having to spend a lot.

Self-medication in times of COVID-19 pandemic

The students surveyed stated that they received information about the measures to counteract COVID-19 on the Facebook social network (78.8%) which is supported by Tejeda and Medina-Neira since it is in these media where information spreads faster and usually has terms of easy purchase for everyone who reads it.

Our results show that students are influenced by social networks when receiving information about medicines to predict COVID-19, which is related to the results of students of the faculty of pharmacy and biochemistry, dentistry and nursing of the National University of the Peruvian Amazon (UNAP) since they are influenced by advertising with percentages of 58.9%, 53.2% and 52.3% respectively. Of the total of these students,

the majority expressed that the observed publicity was given on television with 73.8% in the case of dental students.

We found that 89.8% have a family member or friend who consumes medications without any medical prescription, this shows results similar to those reported by Minan, Conde, Calderon, Caceres, Pena and Donoso where 79.6% say that a close family member self-medicates which shows that the closest social environment is the one that has an unintentional influence on the development of different behaviors being in this case self-medication

The main symptom that led our population to the practice of self-medication was nasal congestion with 28.5%, however, in the study of the aforementioned authors entitled "Factors associated with self-medication with drugs related to COVID-19 in students of health sciences of a Peruvian city" this symptom obtained a prevalence of 35.1% as well as fever and showed as the main symptom of headache with 65.5%. On the other hand, Ramos states that at the Pedro Ruiz Gallo national university and at the university of San Martin de Porres North Branch, the symptom that led students to this practice was pain with 85.9% and 54.1% respectively.

With respect to the drug most used to counteract the symptoms, our study obtained as a result that paracetamol was the favorite with a 66.7%; this is comparable to what Ramos showed since this medication was also preferred among the students.

Of the university students of the national university of San Marcos of the medical technology career, 91.2% said that the place where they go most to get medicines are pharmacies, similar to what Flores and Santos showed, who indicate that UNAP students also usually get them in the same place. In this case, it is shown as results that 57.5%, 55.1% and 66.9% of the students of the faculty of pharmacy and biochemistry, faculty of nursing and faculty of dentistry respectively go to this place to acquire the medicines used in self-medication.

Conclusion

- In the present work, a high prevalence of self-medication in medical technology students of the national university of San Marcos corresponding to 91.15% is evidenced. Therefore, socio-educational data were obtained that reflect that of the number of students who self-medicated, most of them correspond to the female sex, in the area of Clinical Laboratory and Pathological Anatomy and are in the third year of study.
- All the students surveyed showed that they were clear about the concept of self-medication and that a majority are aware that one of the risks caused by self-medication is poisoning followed by allergic reactions.
- The main reason why the students self-medicate is because the disease was not so serious and as a secondary reason the students indicated that they did not have time to go to see a doctor.
- The social network where students received more information about medicines to counteract COVID-19 is the Facebook application.

- The vast majority of students agree that media such as TV, radio, internet influence people to self-medicate.
- Students are influenced by social media when receiving information about COVID-19 screening medications.
- The closest social environment has an unintentional influence on the development of self-medication behaviors, this being prevalent even in times of COVID-19 pandemic.

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