

Cardiological Preventions in Teenagers

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Building a Better Future

Abstract

This research pretends to establish the correlation between habits and physical health awareness in teenagers, taking into account the knowledge of cardiological diseases and cardiovascular devices. For this purpose, the complexity of the cardiological devices and the cardiovascular diseases for which they have been created is explained to later socialize this with the 12-grade students of the Liceo Taller San Miguel, generating, finally, awareness in them about the need to take care of their physical health, through cardiological devices to prevent cardiac complications in the future.

The qualitative research method is used because the data collection is carried out through a presentation to show the importance of taking care of physical health by knowing the cardiological devices and cardiovascular diseases. Subsequently, a survey is carried out where the answers are open and must be justified; the samples are collected selectively and categorized. This project focuses on a line of social research to generate an impact by creating awareness among adolescent students so they can take care of their physical health and avoid having cardiac complications in adulthood.

The findings showed that the 12th-grade students of the Liceo Taller San Miguel satisfactorily understood the objective of this research since they generated a preventive attitude towards the risks involved in not taking care of their physical health both now and in adulthood. This was possible because, thanks to the contents exhibited in the presentation about the devices and cardiological diseases,

Key Words: Cardiological devices, Cardiovascular diseases, Awareness, teenagers, physical health, Prevention.

Justification

This research states that knowing about cardiovascular devices and the diseases treated with them will make students from L.T.S.M. aware of their physical health. According to Partridge et al. (2019), “Cardiovascular disease (CVD) is one of the most significant public health challenges facing today’s adolescents, aged 10–24 years. Adolescents now account for over 25% of the global population”. That's why it is essential to start making teenage students aware of cardiovascular diseases and their physical health, intending to reduce the cases of cardiovascular diseases in adulthood.

Moreover, it is essential to talk about the understanding of cardiological devices and how these devices are helping to improve physical health. Almas (2022) states, “Despite the contemporary techniques and devices available for invasive cardiology procedures, the current diagnostic and interventional modalities have many shortcomings. As a contemporary cross-disciplinary technique, technological advances have demonstrated great potential in interventional cardiology practice”. Almas (2022) states it is relevant for everybody to learn and understand the importance and reasonable procedures of cardiological devices. Thus, this knowledge can help teenage students understand how to care for their physical health, how these procedures are advancing, and also how those advances provide new ways of caring for physical health.

On the other hand, the Texas Heart Institute (2018) says that “Heart disease is not a major cause of death among children and teenagers” (para. 2). This information given by THI may cause indifference in teenagers because they will no longer be concerned about their physical and cardiovascular health. They are not the population most affected by this type of disease.

However, adolescents must take into account their physical health because, regardless of whether they are not the population at highest risk, they must have preventive measures since what is sought is to prevent this population from suffering from cardiovascular diseases in their adulthood.

For these reasons, this research aims to evaluate how cardiological devices can make teenage students from the 12 grade of LTSM aware of care for their physical health, as mentioned in variable one. Cardiovascular diseases directly influence the second variable, which is cardiological devices. This is because understanding cardiological devices and their uses depends totally on knowing the diseases for which those devices are precisely used. Therefore, these two variables have a causal correlation, a positive correlation between the three variables since the first and second variables are those that determine whether the third variable, which is physical health, increases this because depending on the understanding of the population and the awareness that is generated, the care of physical health will increase.

In other words, these variables will be related by explaining and comparing results collected from surveys and talks in the first weeks of the third quarter, specifically from March 11 to 29, during school hours. This project is essential for teenage students, as it will help them gain an amplitude of knowledge and learn how to care for their health. Also, it is important because this project can have a social impact on schools and teenage students, making them conscious of the importance of knowledge not included in school curriculums that can help them in their lives.

In conclusion, this project aims to generate awareness among the 12th-grade students of the Liceo Taller San Miguel so that they can take care of their physical and cardiovascular health

and prevent future diseases in their adults. It also wants to generate a social impact by showing how dangerous it is not to care for physical health and generating general prevention in teenagers for their futures.

Limitations

The limitations of the project can also be taken as problems, and one of these main problems is the quality of the collected information. This information must be concise and specific for the excellent execution of the project. Another big problem in the project is the student's disposition. If the students elected to receive the conferences do not have a good disposition and the topic does not generate interest, everything will be affected since they will not understand the meetings and much less the surveys. That will be carried out to analyze all the results necessary for the project. Time and availability are two of the biggest problems and limitations of the project since these variables include the availability and time of the teachers. Most of them are doctors specializing in the subject who have very limited agendas, and therefore, it has to be in a space in which the schedules coincide. The availability of the spaces the school provides for these types also has to be considered for talks; we also have to consider the project's budget in case the speakers demand payment for their time and the talk.

Delimitations

One of the delimitations of the project is the selection of devices that will be explained to understand the topic for the population. The devices chosen are cardiological since the significant advances can help raise awareness of how care can be taken. Another delimitation of the project is the population elected to receive the information and participate. This population from grades 10 to 12 of the LTSM was elected thanks to the fact that, according to Gordon (2021), “the brain of a teenager has an amazing ability to adapt and respond to new experiences and situations. Take challenging classes”, this indicates that the older population of the LTSM is the most appropriate population for understanding the topic and the project, with the objective that they take the recommendations and take care of their physical health.

Hypothesis

According to the American Heart Association (2024), “Cardiovascular disease is an irregularity in the proper functioning of the heart in which veins and arteries, including the heart itself, may be involved.” That is why cardiological devices are mainly used to treat the riskiest heart diseases; according to the Food and Drug Administration (2024), “Heart disease, also called cardiovascular disease, can have serious consequences. It’s the leading cause of death for adults in the U.S.”. That is why this research pretends to demonstrate that the knowledge of cardiological devices and cardiovascular diseases will generate awareness in the students of 12th grade of L.T.S.M about caring for their physical health. In terms of cardiological devices, this also can develop a preventive culture that teaches and helps teenage students to care for and maintain good physical health from an early age of adolescence. Osokpo (2021) states, “Self-care is critical for maintaining health, minimizing disease complications, and improving quality

of life. Understanding valid, culturally-specific practices and their influence on self-care behaviors can inform the development of interventions to improve outcomes for individuals living with cardiovascular disease (CVD).” according to Reside et al. (2019), “Moreover, the existence of modifiable CVD risk factors, namely, smoking, alcohol intake, diet quality, physical activity, and overweight and obesity, during adolescence increases the chances of having a poor cardiovascular risk profile in adulthood,” and that's why it is relevant for teenage students to be aware of the importance of taking care of their physical health from an e.arly age.

Research Question

How could the cardiological devices make students from 12th grade of LTSM aware of the need to care for their physical health?

Objectives

General Objective

To find the correlation between cardiovascular diseases and cardiovascular devices to generate prevention in the cardiovascular health of students from 12 grade of L.T.S.M.

Specific Objective

- To identify complex knowledge of cardiological devices and diseases they are used for.
- To socialize with students with cardiovascular diseases and the cardiological devices used for them.
- To generate awareness in teenage students about caring for their physical health through the knowledge of cardiological devices.

Theoretical Background or Literature Review: Cardiological preventions for teenagers

Cardiology

Origin

Cardiology is the study of the heart. Cardiology is a part of medicine that hands out the heart. The field includes the medical diagnosis and treatment of congenital heart irregularities. The concept of cardiology as a part of medicine originated in 1310 by biologists, physiologists, and physicists who were Galileo's great direct and indirect disciples. Later in 1616, more precisely on April 17 of that year, 400 years ago, Williams Harvey presented for the first time to the members of the Royal College of Physicians his revolutionary discovery that blood circulated, pumped by the heart, and that it was not generated indefinitely and uninterruptedly.

After these discoveries, Cardiovascular studies continued to advance to the point where, in 1706, Raymond de Vieussens, an anatomy professor, described the structure of the heart's chambers and vessels. With these advances in studies, it was possible that in 1733, Stephen Hales could accurately measure blood pressure for the first time in history. Many years later, cardiological studies were still elementary in the 1800s to early 1900s. Diagnoses were only for patients with symptomatic cardiovascular diseases, and advances continued. The difference is that they continued to advance very satisfactorily and quickly thanks to technology.

According to Mandal (2023), chronologically speaking, the most significant advances in the following years occurred in 1816. A French doctor, René Laennec, invented the stethoscope. 1903 A Dutch physiologist, Willem Einthoven, develops the electrocardiograph or ECG. 1912 American physician James Herring described atherosclerosis as one of the most common heart diseases. In 1938, American surgeon Robert Gross performed the first heart surgery. In

1951, Charles Hufnagel developed the first artificial heart valve. In 1952, An American surgeon named Floyd John Lewis performed the first open heart surgery. In 1967, Christian Barnard, a South African surgeon, performed the first complete heart transplant. In 1982, An American surgeon named Willem DeVries implanted a permanent artificial heart designed by Robert Jarvik in a patient.

Applicability

The applicability of cardiology begins with the exponential increase in cardiovascular diseases, as stated by Sethi et al. (2023): "The prevalence of cardiovascular diseases has almost doubled, from 271 million in 1990 to 523 million in 2019." Thanks to this increase, cardiology is applied with diagnoses, surgical interventions, and unique treatments to treat this disease. The applicability of cardiology has also benefited from the arrival of precision medicine and procedures since these have improved the effectiveness of said applicability.

The practical applicability of cardiology is mainly seen in invasive surgeries and interventions in the human body. "According to the Hearth Association of Cardiology (2023), the most common surgeries in this branch of medicine are Coronary Angioplasty, Laser Angioplasty, Heart Valve Surgery, Atherectomy, Bypass Surgery, Heart Transplant, and Stent Placement." According to the studies carried out, cardiologists around the world constantly carry out these procedures. That is where the applicability of cardiology is evident, and advances in it have helped to improve the application and effectiveness of this branch of medicine.

However, surgical interventions and invasive procedures are only some practical ways of applying medicine to humans. Cardiovascular diagnosis and non-invasive interventions are also more common than you think. These are based on finding irregularities that may occur. To have

a person in his cardiovascular, cardiorespiratory, and circulatory system that would consequently directly affect the proper functioning of the heart, the most common reviews of these functions are the measurement of blood pressure, the measurement of blood pressure, measurement of blood glucose, respiratory, cardiac and blood auscultation, this last procedure is based on the use of the stethoscope to listen to cardiac, respiratory and blood sounds already mentioned as well. According to J. Werth et al. (2019), "X-ray examinations, magnetic resonance Imaging (MRI), ultrasound, and computed tomography (CT) electrographs" are also standard non-invasive procedures used in the application of cardiology.

The importance of cardiology in teenagers

Cardiology is critical in adolescents because it prevents and diagnoses cardiovascular diseases. However, these diseases are not shared at an early age in the same way. The prevention of these is because, according to Texas Heart Institute (2022), "Heart disease is not a major cause of death among children and adolescents, but it is the largest cause of death among adults," this means that teenagers are not safe from cardiovascular complications in their childhood the real problem and worry is the complication to future in adulthood, according to Reside et al., (2019) "Adolescents now account for over 25% of the global population", for this exact reason this research pretends teenagers to understand that it is crucial to take care of their physical and cardiovascular health

This medicine practice in teenagers is not only based on the diagnosis, it is also responsible for carrying out the study of why and what causes cardiovascular diseases in this ages, this means that it has to determine what the risk factors are for an teenagers in terms of physical and cardiovascular health, according to Reaside et al., (2019) "risk factors, namely,

smoking, poor diet quality, excessive alcohol intake, physical inactivity, and overweight and obesity", these are the actions that should be taken to prevent and not suffer a cardiac complication at any age, despite this information also according to Texas Heart Institute (2023) "nearly 25% of high school students use some kind of tobacco product, and nearly 4,000 kids under age 18 try their first cigarette every day. 9 out of 10 smokers had started smoking before they finished high school", adolescent students are the ones who least take into account how dangerous it is not to take care of their physical health and do not mention what this can affect the cardiovascular, cardiorespiratory and cardiocirculatory system in adulthood.

Cardiology has also been responsible for recommending the improvement of cardiovascular and physical health for all ages. Still, these recommendations are focused on teenagers because it is considered that at this age, it is possible to prevent and avoid diseases and cardiovascular complications in adulthood; according to NHS (2024), " ways to prevent are Eat a healthy, balanced diet, Be more physically active, Keep a healthy weigh, Reduce your alcohol consumption, Keep your blood pressure under control, Take any prescribed medicine." Still, according to Rippe (2019), "The American Heart Association estimates that only 5% of individuals follow all of these lifestyle factors as components of a strategy to achieve "ideal" cardiovascular health," so it is worrying that only a tiny part of the teenage population practices good habits for physical and cardiovascular health.

Devices

Origin

Cardiological devices were invented to help cure the cardiovascular complications that a person may have, and they are the devices that also help diagnose these diseases. The origin of

these begins with the curiosity of physicists and physiologists who sought to innovate in how to analyze and measure the proper functioning of the cardiovascular system, and that is why in 1888, Dr. Ernesto Odriozola began with the invention of what was already called a stethoscope at that time, which consisted of a piece of hollow wood carved with two flat sides, one larger than the other, this to listen to the sounds of the heart and veins, other devices created in these years were in 1887 the English physiologist Augustus D. Waller invented and made the first electrocardiogram, a few years later in 1895 Wilhelm Conrad Röntgen invented x-rays after experimenting with cathode ray tubes.

According to Mandal (2023), In 1952, the first pacemaker was created and used by cardiologist Dr. Paul M. Zoll. It was a device with a repeater that activated and assisted the heart with electrical pulses when it received the pumping and passage of blood through the vein. Where it is implanted, this is just an example of a cardiological device that was created in previous years. Still, these cardiological devices have been exponentially modified with social and technological advances. Others have also been developed to generate greater effectiveness of the procedures and their effects. According to the American Heart Association (2022), "Some of The most innovative devices in creation and evolution are The stents, pacemakers, biventricular pacemakers, and defibrillators."

Applicability

The applicability of cardiological devices depends entirely on the number of procedures in which they are required and used. The applicability of cardiological devices is linked to 3 branches: diagnosis, invasive procedures, and non-invasive procedures. Each has various devices that help facilitate and improve cardiology. The cardiological devices used for diagnosis are

usually ubiquitous and easy to use. They are those that, without disturbing the human body, help a cardiologist determine certain irregularities of the patients in which they are used. For example, according to Khiabani et al. (2023), "the most used cardiac device for diagnosis is the electrocardiogram, a quick and painless test that records the electrical signals in the heart. It can tell if the heart is beating too fast or too slow."

Cardiological techniques and procedures known as non-invasive are the procedures in which superficial techniques are used in the human body, and these depend entirely on the type of device used to perform them. According to Aquino A (2023), "some non-invasive techniques and procedures are: Echocardiography, Cardiac single-photon emission computed tomography, Cardiac positron emission tomography, Cardiac magnetic resonance imaging, Coronary computerized tomography angiography," in this type of procedure the most common cardiological devices used are catheter needles, echocardiographs, resonance machines, and radioactive emitters.

The third branch of the applicability of these devices is invasive procedures. These are known this way because they are based on procedures such as surgeries and interventions that can affect the human body. Still, the leading cause of reaching these procedures is when there is a severe disease of the cardiovascular system. The cardiological devices that are most used in this branch are stents, catheters, cardiac balloons, pacemakers, lasers, and internal defibrillators, as well as the procedures in which these devices are used. According to Tayrien et al. (2022), "Cardiovascular invasive procedures are Catheter ablation, Permanent pacemaker, Implantable cardioverter defibrillator, Cardiac catheterization, Percutaneous coronary intervention, Balloon angioplasty, Coronary artery stent, Atherectomy, Laser angioplasty," There are many more

procedures, however in the rest of these the same cardiological devices are used that help and increase the effectiveness of these procedures.

Kinds of devices

Cardiological devices in modern medicine are classified into three different categories according to their level of invasiveness in the human body and the process for which they are used; the first category is the diagnostic devices that, according to Nature (2023), "Diagnostic devices are devices used to identify the nature or cause of a certain phenomenon, usually related to a medical condition. Examples of diagnostic devices are magnetic resonance imaging apparatuses temperature sensors. "and according to the National Academies Press (2023), "stress testing, echocardiography, nuclear imaging, magnetic resonance imaging (MRI), and computed tomography (CT)." are the diagnostic devices most commonly used in cardiology and its procedures.

The second category used in cardiology is non-invasive devices, which, according to the National Institutes of Health (2023), "In medicine, describes a procedure that does not require inserting an instrument through the skin or into an opening in the body," so Both are the devices that are used superficially or with a little introduction into the human body and according to Faragli et al. (2020) Electrocardiography, Echocardiogram, Bioimpedance monitoring, Computed Tomography, Holter, cardiography, Photoelectric plethysmography, Catheteric needles" are the most common non-invasive devices used in cardiology; also these devices are primarily used in routine procedures or to extract samples of both blood and internal or external tissue from some part of the cardiovascular system.

Finally, the last category of devices are the invasive devices according to Klein (2023), "The European Union's Regulation 2017/745 on medical devices, for instance, states that "invasive device'

means any device which, in whole or in part, penetrates inside the body, either through a body orifice or through the surface of the body,” and therefore these devices are almost used for exclusively surgical procedures and are more complex to implant or use, invasive devices The most common in cardiology according to Recco et al. are "pacemakers, implantable cardioverter defibrillators (ICDs), heart valves, balloons, catheters, stents." which, as mentioned before, are implantable and are always used in surgical procedures.

Teenagers

Cardiology in teenagers

Cardiology in adolescents is based on the prevention and diagnosis of cardiovascular diseases. However, these diseases are not shared at an early age in the same way. The prevention of these is because, according to Texas Heart Institute (2022), "Heart disease is not a major cause of death among children and adolescents, but it is the largest cause of death among adults," this means that teenagers are not safe from cardiovascular complications in their childhood the real problem and worry is the complication to future in adulthood, according to Reside et al., (2019) "Adolescents now account for over 25% of the global population", for this exact reason we want teenagers to understand that it is crucial to take care of their physical and cardiovascular health.

Cardiology in teenagers is not only based on the diagnosis, it is also responsible for carrying out the study of why and what causes cardiovascular diseases in this ages, this means that it has to determine what the risk factors are for an teenagers in terms of physical and cardiovascular health, according to Reaside et al., (2019) "risk factors, namely, smoking, poor diet quality, excessive alcohol intake, physical inactivity, and overweight and obesity", these are the actions that should be taken to prevent and not suffer a cardiac complication at any age, despite this information also according to Texas Heart Institute (2023) "nearly 25% of high

school students use some kind of tobacco product, and nearly 4,000 kids under age 18 try their first cigarette every day. 9 out of 10 smokers had started smoking before they finished high school", adolescent students are the ones who least take into account how dangerous it is not to take care of their physical health and do not mention what this can affect the cardiovascular, cardiorespiratory and cardiocirculatory system in adulthood.

This practice has also been responsible for recommending the improvement of cardiovascular and physical health for all ages. Still, these recommendations are focused on teenagers because it is considered that at this age, it is possible to prevent and avoid diseases and cardiovascular complications in adulthood; according to NHS (2024), " ways to prevent are Eat a healthy, balanced diet, Be more physically active, Keep a healthy weigh, Reduce your alcohol consumption, Keep your blood pressure under control, Take any prescribed medicine." Still, according to Rippe (2019), "The American Heart Association estimates that only 5% of individuals follow all of these lifestyle factors as components of a strategy to achieve "ideal" cardiovascular health," so it is worrying that only a tiny part of the teenage population practices good habits for physical and cardiovascular health.

Devices in teenagers

Devices in adolescents are related in the same way they are applied under procedures, primarily diagnostic or surgical. These procedures used by specialists to treat cardiac diseases and complications in adolescents are the same as those used by specialists would be used in an adult person, with the exponential difference that the specialist intervenes in a body that is still growing and that is much more complicated to operate due to its small spaces, which is why the advancement of cardiological technology has helped a lot to improve and facilitate cardiological

procedures in teenagers, the adaptation of devices such as pacemakers, stents, and catheter needles have made cardiological procedures in teenagers much more accessible for specialists and less risky and invasive for the patient's body.

According to polo et al., (2022) "In 2022, a total of 503 cardiac surgeries were performed, of which 320 (63.6%) corresponded to male patients. Of the total number of patients operated on, 106 (21.0%) were less than 20 years old", this shows that the advancement of cardiological technology has allowed many more surgical procedures to be performed on teenagers, although this can be taken as a good thing, it is also a bad thing since it shows that cardiovascular health in adolescents young people is very vulnerable and can be a product of the bad habits that this population adopts, based on these studies it can be seen that the number of young people who a few years ago and today undergo surgery for suffering from some type of disease or cardiac irregularity is very high than what it should be and these Numbers can continue to increase with age and depending on physical health care habits, which is why it is essential to raise awareness among teenagers so that they know how important their health today and that of their future is, and this can be achieved by showing and making evident how bad habits in adolescence can affect cardiovascular health in adults, and also by making known how dangerous, complicated and invasive it is to treat and overcome a heart disease or irregularity.

Physical health

Teenagers' habits today are worrying because they follow the modes and attitudes of other people that influence them. As Buda et al. state, "Social media use is one of the most popular leisure activities among adolescents. Concurrent concern is growing regarding problematic social media use and its relationship with health behaviors". These fashions today

are the high consumption of alcohol and the beginning of smoking, usually with devices. Such as vapes As the Texas Heart Institute (2023) states, "Nearly 25% of high school students use some type of tobacco product, and nearly 4,000 children under age 18 try their first cigarette every day. 9 out of 10 smokers. "They had started smoking before they finished high school.". Another problem that adolescents may have is the normalization of obesity at an early age since many people defend this problem, and that is why adolescents do not see the risk it has on their cardiovascular health.

According to Marques et al., "4.7% of boys and 4.4% of girls aged 11 years, 3% of boys and 2% of girls aged 13 years, and 1.5% of Boys and 0.8% of girls aged 15 had perfect scores on a healthy lifestyle." As age increased, the prevalence of adolescents with a healthy lifestyle decreased. "This shows how adolescents, as they grow and age, begin to adopt negative habits that harm their physical health; also, according to Orcajada (12, 2022) " Adolescence is a crucial stage in human development, and there are differences in psychological, physical and body composition variables between men and women. "It is essential to raise awareness among students so that in the future, they do not have any medical or health complications, especially cardiovascular.

Methodological Framework: Cardiological prevention for teenagers.

To solve the research question about how the cardiological devices could make students from 12th grade of LTSM aware of the need to care for their physical health, this section of the paper proposes to find the correlation between cardiovascular diseases and cardiovascular devices to generate prevention in the cardiovascular health of students from 12 grade of L.T.S.M. This objective implies to take into account the specific goals of the project, such as identifying complex knowledge about cardiological devices and the diseases for which they are used, also to

socializing with students the knowledge about the devices and diseases and finally generating awareness in the students. For them to take care of their physical health, the mixed research methodology will be used since it is more viable since the data to be collected evaluates phenomena, which must be analyzed from qualitative and quantitative methods that allow us to delve deeper into them.

Data collection in the project will be essential, such as surveys and intervention in groups, to look at the levels of interest of teenage students of 12th grade from L.T.S.M. Also, those methods can give information on how the students care for their health and whether they do or not. This way, surveys and interventions focus on the students' opinions. The intervention session consists of a well-structured presentation of the research to share and illustrate the critical information about the topic to the students; this is influenced by the information provided by the documents, articles, books, passages, etc., which is scaffolded into simple terms to facilitate the process of students' comprehension.

The population chosen for this project were the 12-year-old students of the Liceo Taller San Miguel since these are the oldest students of the institution. Therefore, they may be more receptive to this learning; as Messinger (2018) says, "As the brain develops, there is enhanced synaptic plasticity—teens learn faster and memories last longer." The type of data collection is quantitative and qualitative since the questions that will be asked are collections of numerical or percentages, and other questions will be about justification; the questions that will be asked are categorized into these categories. These are the categories that were used to synthesize the questions and ask them in a more organized way.

Cardiological questions

- Do you know your family's cardiovascular history?
- Is it essential to talk about this topic with the next generations of teenagers?
- Do you have any risk factors mentioned in the talk about your life?
- Knowing the risks in the future, would you change your habits?
- Do you think taking care of your physical health from adolescence is essential?
- What do you think are the risk factors that are most present in the lives of adolescents?

Cardiovascular diseases questions

- Do you think there is a relationship between cardiological devices and preventing cardiological diseases?
- Does knowledge of cardiovascular diseases and the treatments used for each of these make you aware of how dangerous it is not to take care of your physical health at an early age?

Cardiological devices questions

- What cardiological device do you know?
- Do you think there is a relationship between cardiological devices and preventing cardiological diseases?

Justification questions

- If your answer was no, justify
- Justify your answer
- Why do you know it?

Intervention Questions

- Do you know your family's cardiovascular history?
- Do you think there is a relationship between cardiological devices and preventing cardiological diseases?
- Do you have any risk factors mentioned in the talk about your life?
- Knowing the risks in the future, would you change your habits?

This categorization of the questions synthesizes the answers and subsequently asks them to be analyzed and categorized in the same way as the questions to explain the results better.

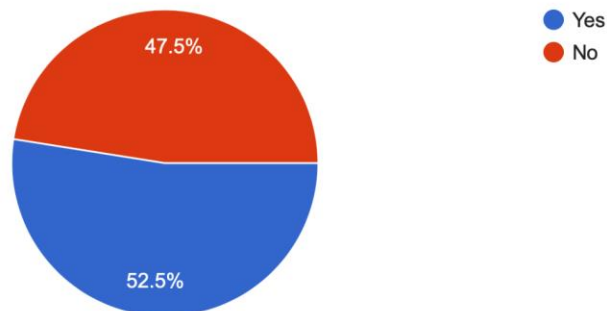
Results

Figure 2

Figure about the cardiovascular history of students' family

Do you know your family's cardiovascular history?

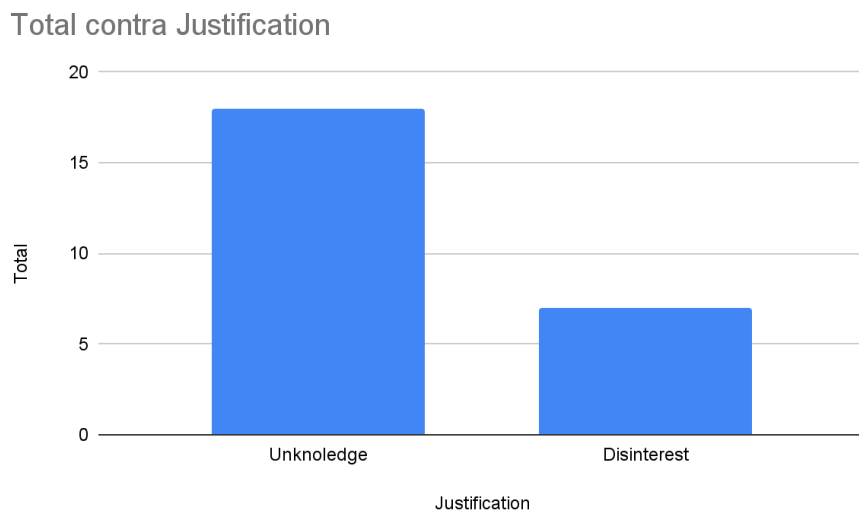
40 respuestas



Note.

Figure 3

Justification of answers (no)



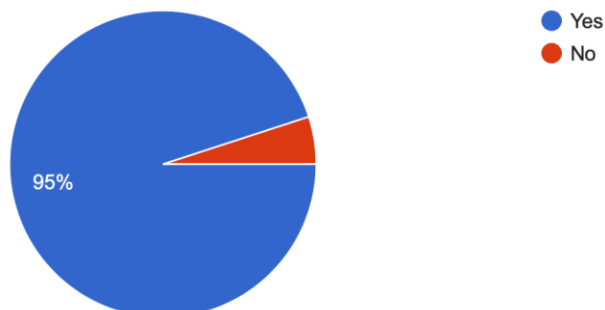
Note. The answers given by the elected population were collected and categorized because the responses had common points, and because of this, they were summarized in the two categorization variables.

Figure 4

The figure for the opinion of teenagers on the relationship between devices and the prevention of diseases

Do you think there is a relationship between cardiological devices and Prevention for cardiological diseases?

40 respuestas

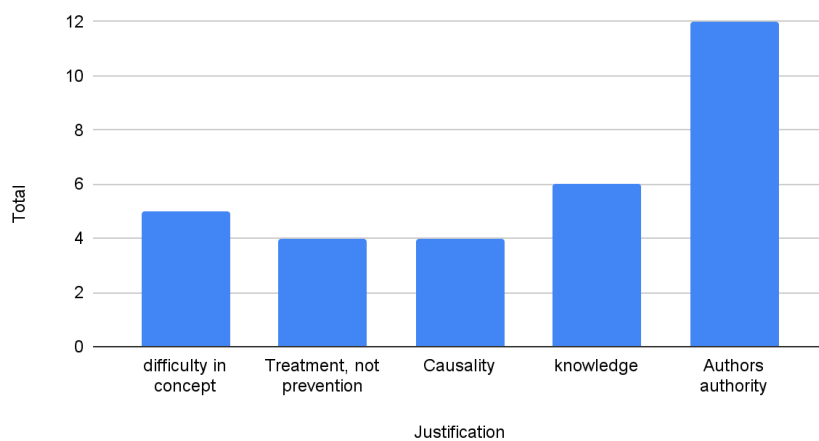


Note.

Figure 5

Justification for answers (yes, no)

Total contra Justification



Note. The answers were categorized into groups that have similarities; there were four categories due to the percentage of yes and no answers,

Figure 6

Figure of students' opinion on the topic in the next generations

Do you think it is important to talk about this topic with the next generations of teenagers?

40 respuestas

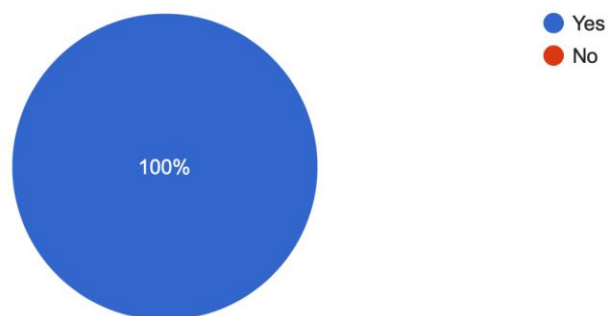
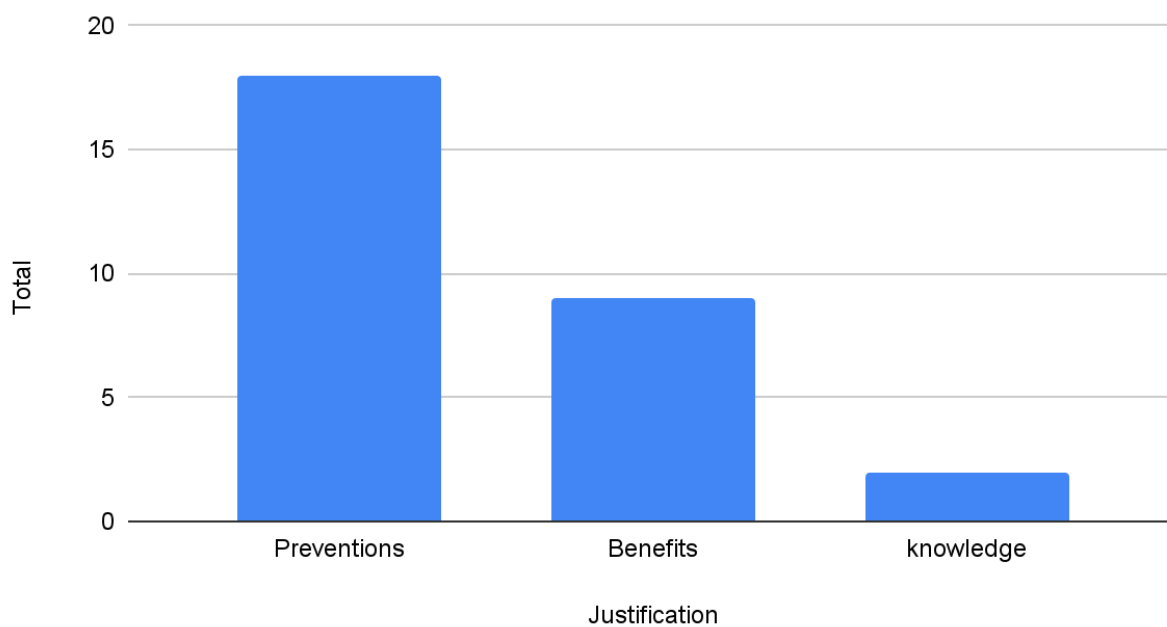


Figure 7

Justification of answers (yes)

Total contra Justification



Note. The answers were categorized into three mainly positive variable groups since 100% of the responses were (yes) because the answers have these standard variables.

Figure 8

The figure for risk factors present in students

Do you have any of the risk factors mentioned in the Talk in your life?
40 respuestas

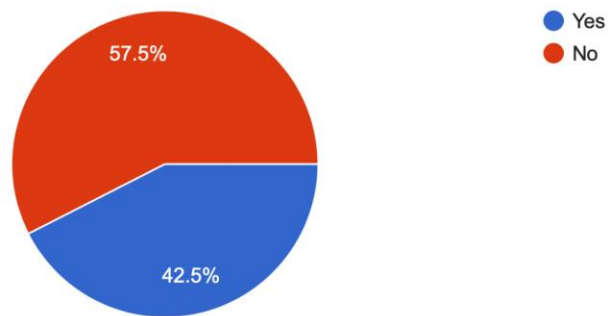
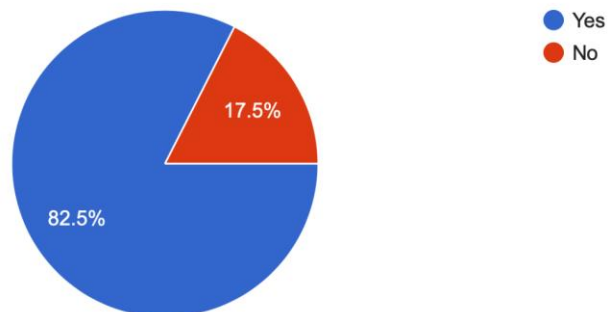
**Figure 9**

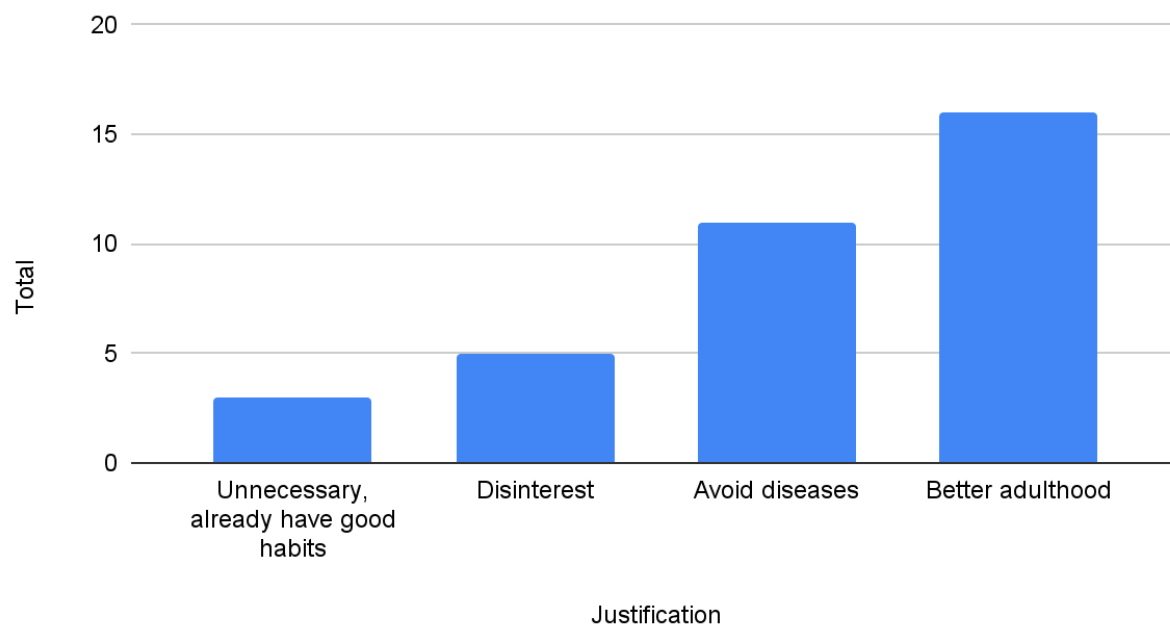
figure for students concerned about their bad habits

Knowing the risks in the future, would you change your habits?
40 respuestas

**Figure 10**

Justification of answers (yes, no)

Total contra Justification



Note. The students' yes and no answers were grouped into groups with common factors.

Figure 11

Figure for students' opinion on physical health care in adolescence

Do you think it is important to take care of your physical health from adolescence?

40 respuestas

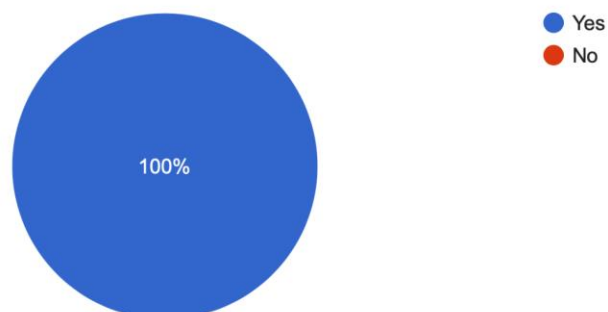
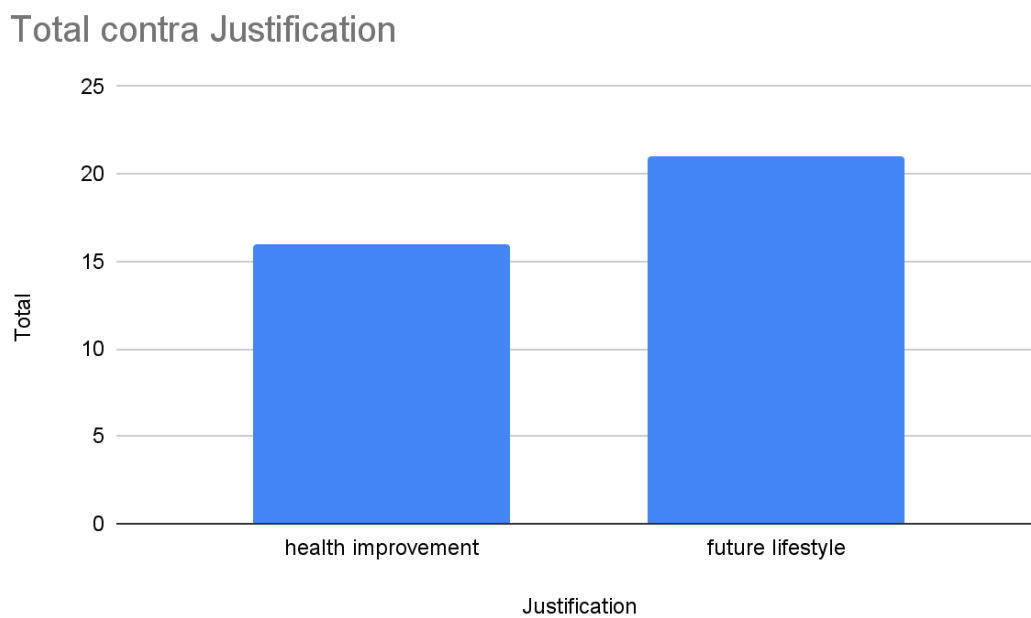


Figure 12

Justification for answers (yes)



Note. The answers were categorized into two mainly positive variable groups since 100% of the responses were (yes) because the answers have this standard variable.

Figure 13

Figure of students' opinion about the importance of devices

Do you think it is important to know about cardiological devices, how they are categorized, why, when and how they are used?

40 respuestas

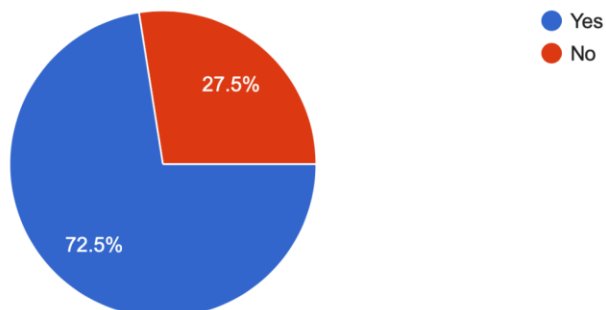
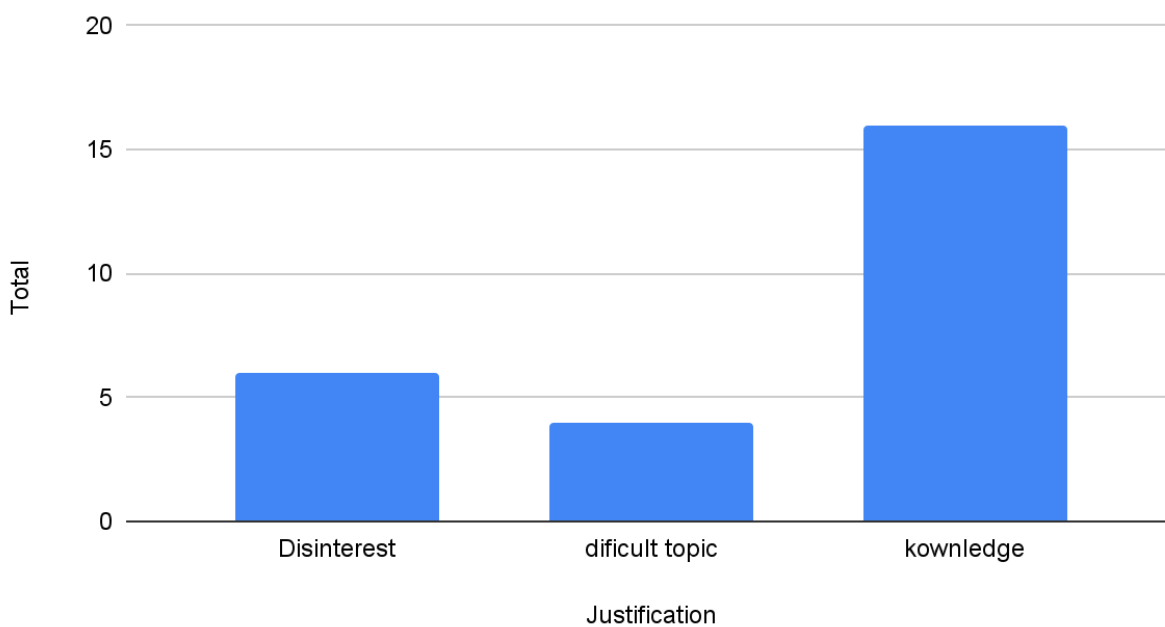


Figure 14

Justification of answers (Yes, no)

Total contra Justification



Note. The answers were concrete and, therefore, categorized into three main groups.

Figure 15

Figure of the level of awareness generated by knowledge of cardiovascular diseases in students

Does knowledge of cardiovascular diseases and the treatments used for each of these make you aware of how dangerous it is not to take care of your physical health at an early age?

40 respuestas

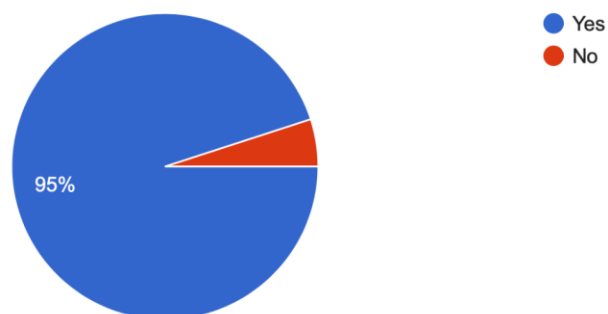
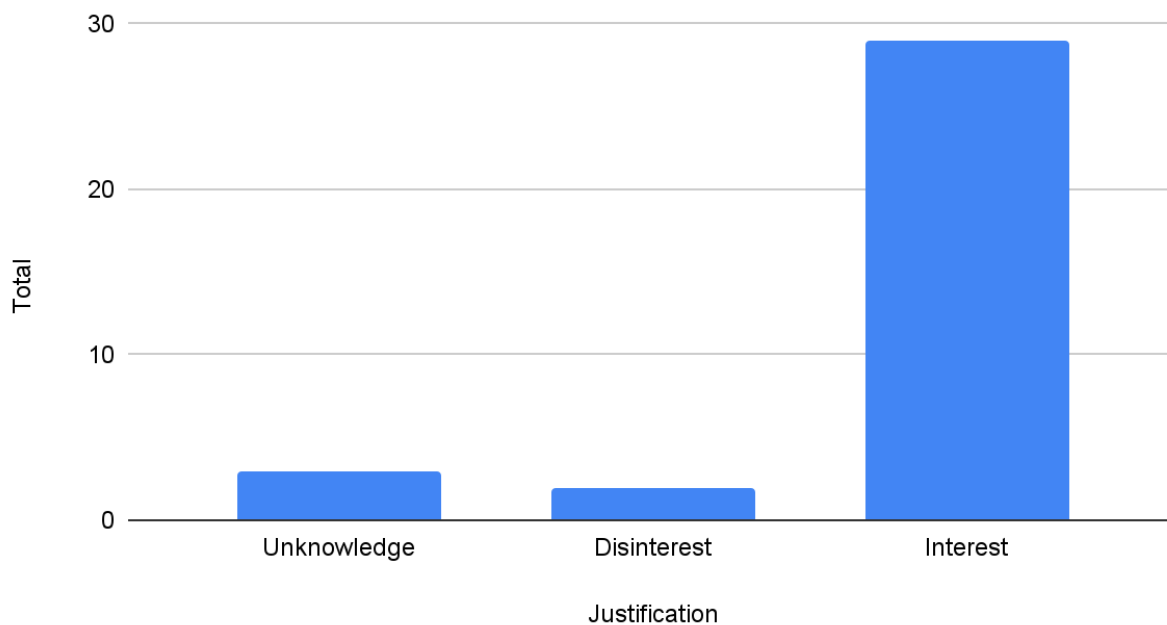


Figure 16

Justification of answers (yes, no)

Total contra Justification



Note. The answers were concrete and, therefore, categorized into three main groups: 2 with common no factors and 1 with most answers having the variable in common.

Figure 17

Figure of students' opinion of risk factors in teenagers

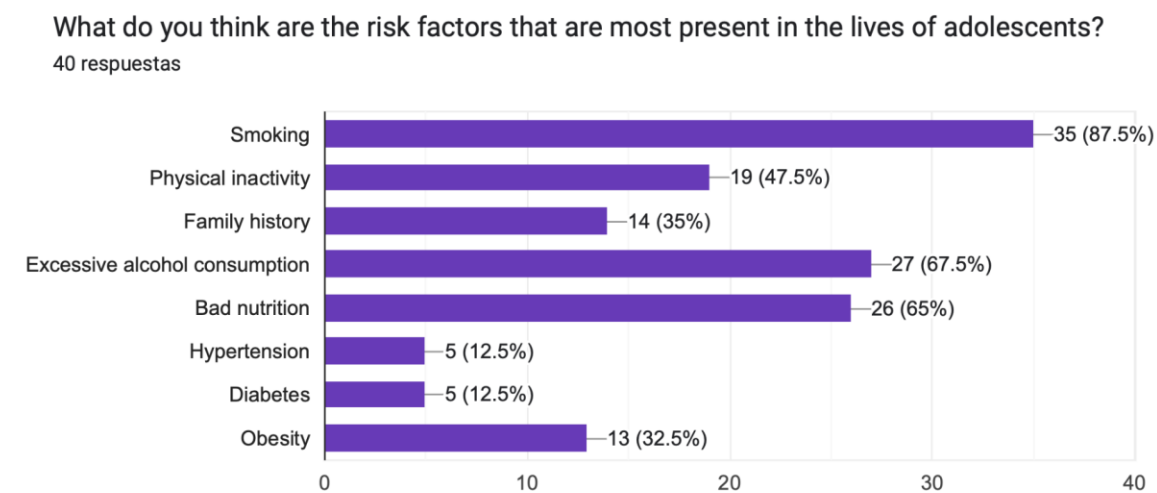


Figure 18

The figure of students' knowledge about cardiological devices

What cardiological device do you know?

40 respuestas

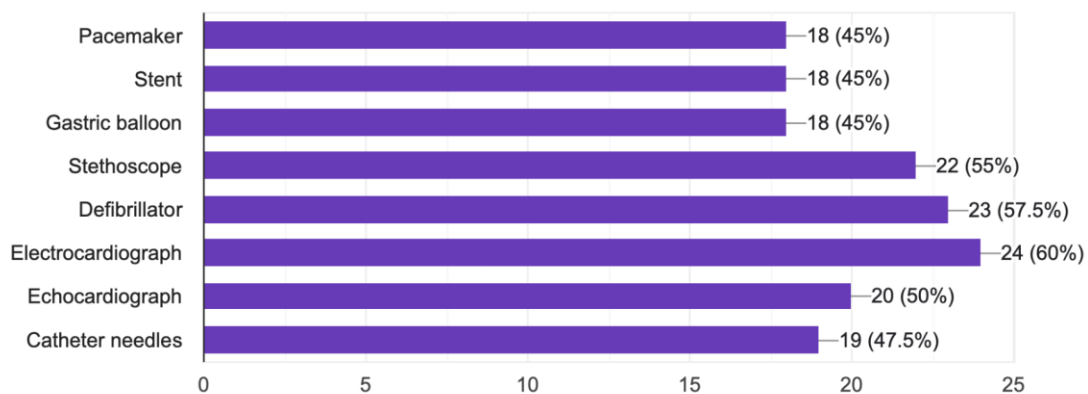
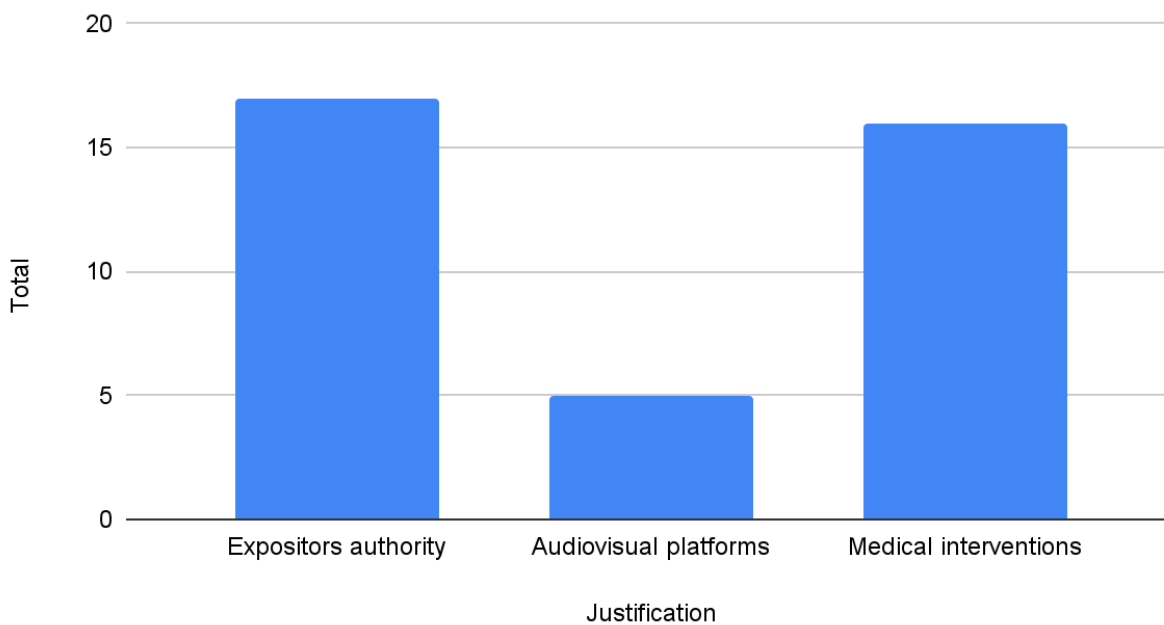


Figure 19

Total contra Justification



Note. The responses about where and why they knew the devices were grouped by the most common parts and reasons for this knowledge.

Discussion

Considering the data collected, it is evident how the cardiological devices used in this research promote, in most 12th-grade students, a change of perception regarding the potential risk presented by cardiovascular diseases. The results showed that with the presentation and explanation given to the students, awareness was generated regarding the possible risks and repercussions of not taking care of their comprehensive health that allows them to avoid suffering from any illness or complication in adulthood.

Reaside et al. (2019) say "risk factors, namely, smoking, poor diet quality, excessive alcohol intake, physical inactivity, and overweight and obesity." This can be related to figures 8 and 19, where the students surveyed ultimately identified the risk factors they present in their lives and those usually familiar to adolescents. Also, the Texas Heart Institute (2022) says, "Heart disease is not a major cause of death among children and adolescents, but it is the largest cause of death among adults." This information can be related to figures 9, 11, and 15, where thanks to the presentation given to the students, awareness and a type of concern are generated to take care of their physical health now to prevent irregularities or heart diseases in the future.

Texas Heart Institute (2023) "Nearly 25% of high school students use some kind of tobacco product, and nearly 4,000 kids under age 18 try their first cigarette every day. 9 out of 10 smokers had started smoking before they finished high school". This information is directly related to the results obtained in Figure 8, where a percentage of the respondents stated that they had some type of risk factor in their life. More specifically, it is related to Figure 17, where the students say that they believe that the most common risk factor among students is smoking, Tayrien et al., (2022), "cardiovascular invasive procedures are Catheter ablation, Permanent pacemaker, Implantable cardioverter defibrillator, Cardiac catheterization, Percutaneous

coronary intervention, Balloon angioplasty, Coronary artery stent, Atherectomy, Laser angioplasty," This information can be related to figure 18 where students quickly recognize the majority of cardiological devices used regularly in day-to-day invasive cardiovascular procedures and that the same students justify that they have this knowledge thanks to the concepts that were given to them by part of the exhibitor.

Somberg (2020) says, "Globally, cardiovascular death is once again the main cause of death, claiming the lives of 18 million people each year", and this information is related to figures 6, 9, and 15, where the students say that It is essential to take care of physical and cardiovascular health from adolescence to avoid complications or cardiac irregularities in adulthood. Given the results obtained, it can be inferred that it is possible to establish a preventive system in adolescents that allows them to have healthy lifestyle habits to guarantee good cardiovascular health in adulthood.

The relationship between the three variables, Cardiological devices, Awareness, and adolescents, was positive, thanks to the fact that the main objective of this research is to generate awareness in adolescent students about cardiological devices and how, where, when, and why these are used for adolescents to take care of their physical health now to prevent future heart disease or irregularity. Nevertheless, the significant insight that the project provided was how the 12th-grade students need to work on their self-knowledge about caring for health and the impact it has in their adulthood.

Conclusions

Cardiological devices, according to the research and the results obtained, help the adolescent students of 12th grade of L.T.S.M. understand cardiac diseases as well as the procedures that are used in medicine to treat these; the students also become aware by learning

about the future risk that exist in the risky habits they take, this specific learning of the cardiological devices generates in them more concern about the way they take care of their physical health to, as they said in their justifications, to have a better lifestyle in their adulthood, in conclusion Cardiological devices can raise students' awareness through knowledge of the main functions of these devices, the cardiovascular diseases for which they are used and the risk factors for physical health in adulthood.

The presentation of cardiological devices helps raise students' awareness about taking care of their physical health; their knowledge generates a preventive attitude towards the diseases for which the devices are used, which fulfills part of the project hypothesis. However, there is still a gap between a preventive culture among teenagers and knowing how to take care of their physical health and the risks of their actions in their youth and the risks in their adulthood.

The general objective of this project was achieved because it related to understanding the cardiological devices and diseases in 12th-grade students of L.T.S.M. to raise awareness about the importance of taking care of their physical health and its impact on their future lives.

Thanks to the identification and learning of cardiological knowledge in terms of technological devices and diseases, it was possible to generate awareness regarding taking care of their health, which fulfills the first specific objective based on the identification of knowledge. This fulfills the second particular objective since it is based on the socialization of the understanding of cardiological diseases and devices, as already mentioned and as demonstrated in the results obtained; thanks to this transmission of knowledge to the students, a preventive attitude was generated in them, both personally and as a group, towards the care of their physical and cardiovascular health by understanding how harmful bad habits can be and, consequently, cardiovascular diseases in adulthood.

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Annexes

Annex 1

Surveys results

[Formulario sin título \(Respuestas\)](#)

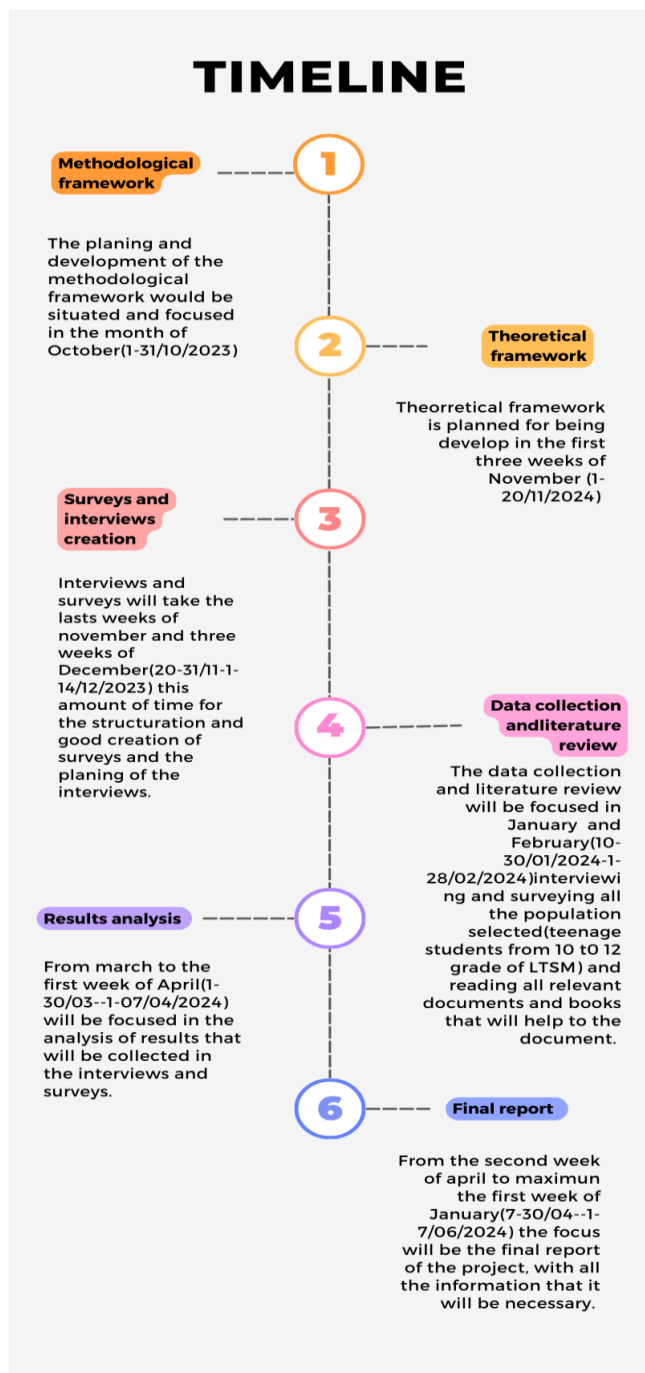
Annex 2

Cardiovascular presentation survey

<https://forms.gle/SwoWGe5uNPQihyxJA>

Figure 1

Timeline



Note.: Timeline of the process and dates of how the project will develop