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# Review on the Positive and Negative Impact of Covid-19 Pandemic on Environment and Society

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## Abstract

This review search aims to show the positive and negative impact of COVID-19 on the all aspects of life such as environment, education, economy, politics, social life, and social media, and most importantly global human health and health services. particularly in the most affected countries such as China, USA, Canada, Italy, Spain, Germany, UK, Brazil, Mexico, India, and Iraq. In terms of the environment our search shows that there is a positive impact associated between measures and improvement in air quality, reduction of fossil fuel traffic pollutes, reduction in greenhouse gases (GHG) generation, clean beaches, and environmental noise reduction due to air traffic suspension. The negative impact was associated with aspects such as the reduction in recycling and the increase in waste, which was endangering the contamination of natural resources (water and land), in addition to air. Other negative impacts on reduction global economic activity. In terms of education, COVID-19 had a big effect in changing the education system from classroom to electronic learning. The COVID-19 pandemic has had far-reaching economic consequences beyond the spread of the disease itself and efforts to quarantine it. As this virus has spread around the globe, concerns have shifted from supply-side manufacturing issues to decreased business in the services sector. The pandemic caused the largest global recession in history, with more than a third of the global population at the time being placed on lockdown. ((Anon., April-2020) Health-wise it was the reason for the reduction of the world population due to the high mortality and death rate. This is expected to be carried on for unpredicted months perhaps a year until the right vaccine is in reach of every person in the world.

**Keywords:** (GHG), COVID-19, vaccine, Pandemic, Environmental impact, Global

## Introduction

The COVID-19 pandemic has led to a dramatic loss of human life worldwide and presents an unprecedented challenge to public health, food systems and the world of work. The economic and social disruption caused by the pandemic is devastating: tens of millions of people are at risk of falling into extreme poverty, while the number of undernourished people, currently estimated at nearly 690 million, could increase by up to 132 million by the end of the year of 2020. In this study we focusing on the

positive and negative impact of COVID-19 pandemic in several global issues which has been affected with this pandemic, such as environment, education, connectedness, peace, Enovation and economy. (impact-of-covid- 19-on-people.., 2020)

COVID 19's impact on the environment has been mixed. Although the pandemic resulted in improved environmental conditions, there have been other negative effects, some of which are obvious, others less.

In brief, the positive effects have been reduced GHG (greenhouse gas) emissions, improved water quality, reduced noise pollution, improved air quality and in some cases, wildlife restoration. Negative effects have been increased medical waste, haphazard disposal of PPE, increased municipal waste and reduced recycling efforts.

The unprecedented current situation caused by Covid-19 has disrupted most professions across the globe with accounting and auditing being no exception. Mandatory lockdown measures were imposed by governments to control the spread of the virus, with individuals having to work from home where possible. For auditors, this means they can no longer travel to audited entity premises, nor even to their own offices and that their audits will have to be completed remotely.

If there is a positive side to this significant challenge for auditors, it is that the audit profession was already on a journey to becoming more digital, and the investment in digital capability has allowed many firms and practitioners to adapt to the new circumstances relatively more quick than other industries.

COVID-19 has had undeniable and horrific consequences on people's lives and the economy. With sickness, death, and unemployment rates soaring almost everywhere on our planet, it is easy to despair.

The global impact of Coronavirus is immense as educational institutes all over the world are closed. Covid- 19, has thrown education all over the world in a loop. Schools are shut, and students are stranded at home, with extremely limited contact with friends and virtually no physical activity, thanks to the Covid-19 pandemic raging across the world. IB, A-Levels, ICSE, CBSE knew and recognized boards have postponed or cancelled examinations. Likewise, top colleges like MIT, Harvard, Princeton have closed. (seven-positive- outcomes-of-covid-19, 2020)

Closer home, institutions like IITs and IIMs have all closed their campuses and moved classes online. Even standardized tests like GCSE, A levels, GNVQ, SATs, remain suspended and the future of many students hangs in balance! There is panic all around and educators and students alike are confused as to the next steps and continuity concerning educational objectives. (how-is-the-covid-19-pandemic-affecting-education-all- over-the-world, 2020-04-07)

Corona virus pandemic has wide-ranging and severe impacts upon financial markets, including stock, bond and commodity (including crude oil and gold) markets. Major

events included the Russia–Saudi Arabia oil price war that resulted in a collapse of crude oil prices and a stock market crash in March 2020.

The United Nations Development Programme expects a US$220 billion reduction in revenue in developing countries, and expects COVID-19's economic impact to last for months or even years. (Noticias, 30 March 2020), (A b Palumbo D. (., 2020)

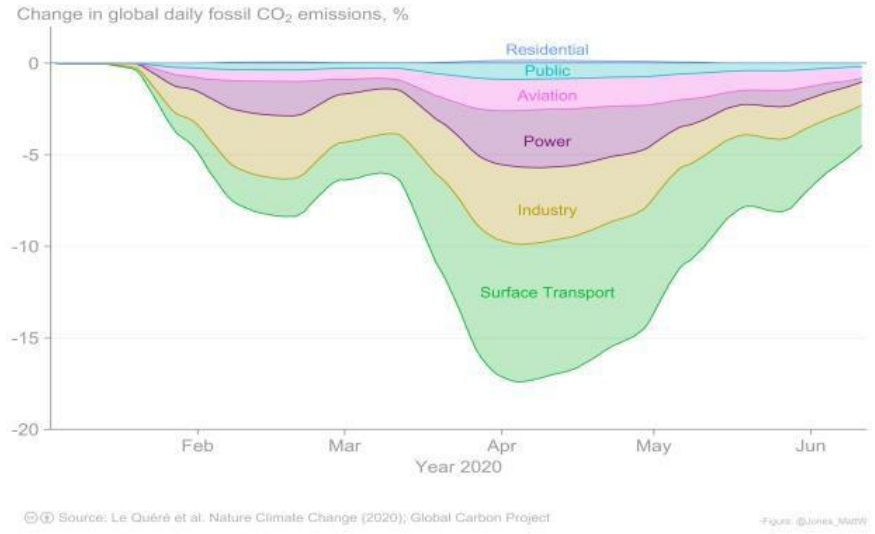
Positive impacts of COVID-19:

Despite the COVID-19 undeniable and horrific consequences on people's lives and the economy.

With sickness, death and unemployment rates soaring almost everywhere on our planet, it is easy to despair. It had some positive impacts on the environment and society. Seven positive outcomes have been summarised below:

**1. Environment**

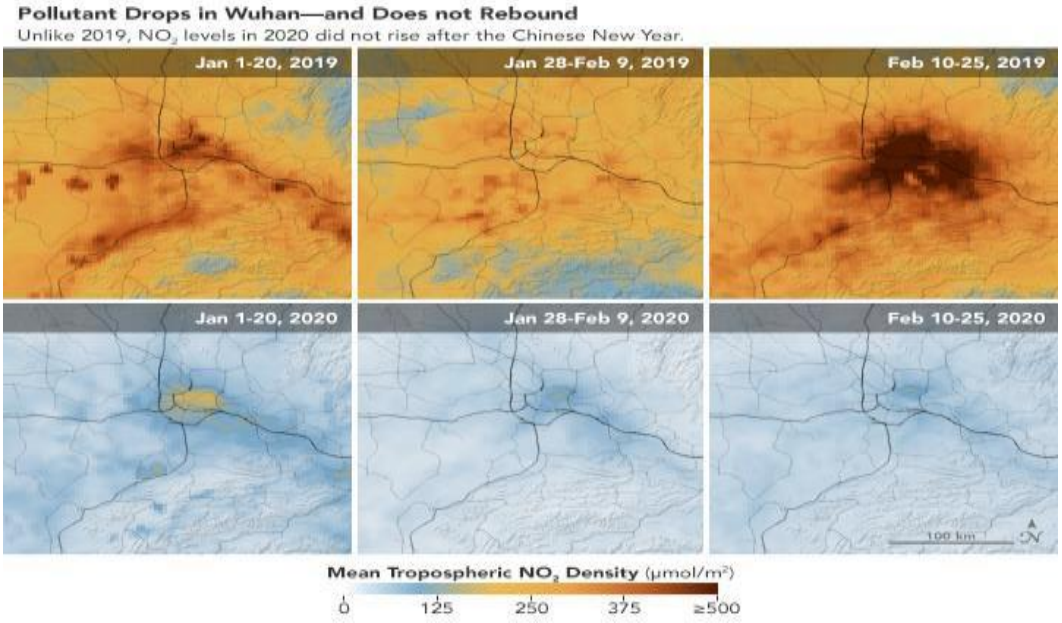
The first positive aspect of COVID-19 is the effect on the environment. Carbon emissions are down globally and with manufacturing and air travel grinding to a halt, the planet has had a chance to revitalise. (covid-19-the-impact-of-coronavirus-on-the-environment., 20200326)




China recorded an 85 per cent increase in days with good air quality in 337 cities between January and March. With tourists gone from Italy, the long-polluted canals of Venice now appear clear as fish and other wildlife start returning. Elsewhere, wildlife is also reappearing in other major cities and the biodiversity is slowly starting to return in various parts of the world.

NASA and ESA have been monitoring how the nitrogen dioxide gases dropped significantly during the initial Chinese phase of the COVID-19 pandemic. The

economic slowdown from the virus drastically dropped pollution levels, especially in cities like Wuhan, China by 25-40%. NASA uses an ozone monitoring instrument (OMI) to analyse and observe the ozone layer and pollutants such as NO2, aerosols and others. This instrument (un.org/en/un-coronavirus-communications-team). (coronavirus- communications-team/fury-virus-illustrates-folly-war) helped NASA to process and interpret the data coming in due to the lock-downs worldwide this was reported in the image below: (un-coronavirus- communications-team, 2020) ., (23 September 2020.; Times, "Pandemic knocks a tenth off incomes of workers around the world".)




Images from the NASA Earth Observatory show a stark drop in pollution in Wuhan, when comparing NO2 levels in early 2019 (top) and early 2020 (bottom). (Earth Observatory"., 2020)

**Peace**

The coronavirus is also raising hopes of fewer battles and less conflict, resulting in increased levels of peace. The United Nations called to end all wars in the face of COVID-19 as the world confronts a common enemy: “It’s time to put armed conflict on lockdown,” stated Secretary-General António Guterres.

So many businesses have had to reinvent themselves with a new 'business as unusual' philosophy. According to the ABC, a ceasefire, was declared by the Saudis fighting Houthi rebels in Yemen. Although there are many places in the Middle East where war persists, a stronger lockdown could lead to less violence in these countries too.

(Times, Pandemic knocks a tenth off incomes of workers around the world, 23 September 2020.), (abc.net.au, 2020-04-10)

All countries in the world showed their humanity to their own people. They become introspective and taking quick decisive and positive action. Everyone agreed the importance of quarantine and the new word that sprout out like enhance 14-day quarantine, lock down, social distancing, boarder closing from all countries. The leaders of the world scampered in unity on how to combat this disease and have never been cooperative in sharing best practices on how to prevent o stop the spread of this virus. There is a complete change in dealing with fellow human. We tend to protect ourselves from being too near for the sake of oneself and everyone.

The new order is to stay at home, showed to be a positive sign, maybe we need to go back to the basics of life. Family! We need to have more time for our loved ones. Bonding this time is enforced by the circumstances, or is it. It could be a message from each of one to prioritize our priorities. They are our family, our health and our values on life. It is a wakeup call for the religious or spiritual or believer or whatever to meditate about life and how we suddenly see the changes in pattern at looking at things. (A b Palumbo D. (., 2020)

**Connectedness**

A third positive outcome is a revitalizing sense of community and social cohesion. Self-isolation challenges us as social animals who desire relationships, contact and interaction with other humans.

However, people all around the world are finding new ways to address the need for interconnectedness. In Italy, one of the worst-hit countries, people are joining their instruments and voices to create music from their balconies. People are leading street dance parties while maintaining social distancing. People are using social media platforms to connect, such as the Facebook group The Kindness Pandemic, with hundreds of daily posts. There is a huge wave of formal and informal volunteering where people use their skills and abilities to help. (newyorker.com/culture/video-dept/the-, 2020)

**Innovation**

COVID-19 is a major market disruptor that has led to unprecedent levels of innovation. Due to the lockdown, so many businesses have had to reinvent themselves with a new 'business as unusual' philosophy. This includes cafes turning into takeaway venues (some of which also now sell milk or face masks) and gin distilleries now making hand sanitisers. Many businesses have had to undergo rapid digitalisation and offer their services online. Some could use this wave of innovation to reimagine their business model and change or grow their market.

## Corporate Responsibility

Coronavirus is driving a new wave of corporate social responsibility (CSR). The global pandemic has become a litmus test for how seriously companies are taking their CSR and their work with key stakeholders: the community, employees, consumers and the environment. Home-schooling is becoming the new way of learning, exposing many parents to what their children know and do. Companies are donating money, food and medical equipment to support people affected by the coronavirus. Others are giving to healthcare workers, including free coffee at McDonald's Australia and millions of masks from Johnson & Johnson. Many are supporting their customers, from supermarkets, introducing an exclusive shopping hour for seniors and people with disabilities to Optus giving free mobile data so its subscribers can continue to connect.

(lighthouse.mq.edu.au, april-2020), (jnj.com, 2020), (woolworths.com.au, 2020), (optus.com.au, 2020)

There must be a global human-centred response which is grounded in solidarity. International Labour Standards (ILS) contain guidance for ensuring decent work that is applicable even in the unparalleled

context of the COVID 19 crisis. In particular, the Employment and Decent Work for Peace and Resilience Recommendation, emphasizes that crisis responses need to "ensure respect for all human rights and the rule of law, including respect for fundamental principles and rights at work and for international labour standards". The standards dealing with safety and health at work, social security, employment, non- discrimination, working arrangements and the protection of specific categories of workers provide guidance on the design of rapid responses that can facilitate a stronger recovery from the crisis. A coordinated global effort is required to support countries that currently do not have sufficient revenues space to finance social policy, in particular universal social protection systems. Debt sustainability should be prioritized in this endeavour. (R205, 2017)

## Education

The sixth positive outcome is massive transformation in education. True, most of it was not by choice.

With schools closing down all around the world, many teachers are digitalising the classroom, offering online education, educational games and tasks and self-led learning.

Silver linings amid the suffering: Professor Debbie Haski-Leventhal believes a new found sense of gratitude for freedoms we take for granted and a global trend in thanking health workers who are at the frontline are among the positives to come out of the crisis. We are globally involved in one of the largest-scale experiments in

changing education at all levels. Home-schooling is becoming the new way of learning, exposing many parents to what their children know and do.

Similarly, universities are leading remote learning, and use state-of-the-art solutions to keep students engaged. Some universities are using augmented and virtual reality, to provide near real-life experiences for galvanising students' curiosity, engagement and commitment and for preparing students for the workplace. (newyorker.com/new, 2020), (timeshighereducation.com, 2020), (edsurge.com/news, 2020-03-18)

Four positive changes in education due to Covid-19

Any change that is so disruptive is also likely to bring with it some new opportunities that will transform the higher education system worldwide and especially in a country like India which is planning to bring about a planned reform in this sector. Some of the key areas of opportunity are the following:

**Rise in Blended Learning**

Universities and colleges will shift to a model of blended learning where both face-to-face deliveries along with an online model will become a norm. This will require all teachers to become more technology savvy and go through some training to bring themselves to the level that would be required.

**Learning management systems to be the new standard**

A great opportunity will open up for those companies that have been developing and strengthening learning management systems for use by universities and colleges. This has the potential to grow at a very fast pace but will have to be priced appropriately for use by all institutions.

**Improvement in learning material**

There is a great opportunity for universities and colleges to start improving the quality of the learning material that is used in the teaching and learning process.

Since blended learning will be the new format of learning there will be a push to find new ways to design and deliver quality content especially due to the fact that the use of learning management systems will bring about more openness and transparency in academics.

**Rise in collaborative work**

The teaching community to a large extent has been very insulated and more so in a country like India. There is a new opportunity where collaborative teaching and learning can take on new forms and can even be monetized. Finally, it is expected that there will be a massive rise in teleconferencing opportunities which can also have a negative impact on the travel.

A large number of academic meetings, seminars and conferences will move online and there is a possibility that some new form of an online conferencing platform will emerge as a business model.

After all this, there is one certainty that we can envisage and that is going to change how higher education will operate globally. There no one country just going through a reform in the higher education sector, but now it will go through a major transformation in general. (msn.com/en-in/news/world, 2020), (indiatoday.in/education-today., 2020), (Kamlesh Misra, 2020)

**Covid-19: Education system's big shift from classrooms to computers**

The biggest change that the education system globally has seen this year is the massive shift to e- learning or digital classrooms. The first few weeks after outbreak of virus, have observed heightened awareness of the Coronavirus outbreak in the nation. In an earnest effort to contain this virus, several measures are being implemented by the government. To reduce large gatherings, locking down the country is the major step that the government has taken towards safeguarding the citizens of the nation.

While most of the corporate industry is functioning from home; schools, colleges and other institutions have ordered temporary shut down too. As the virus spreads across the globe, let us understand what it means to the education of the students, who are now under the 'house arrest' (Indiatoday, 2020).

**Number of schools shut due to Covid-19**

Earlier UNESCO had announced that 22 countries had closed schools, affecting over 290 million children, while nine other countries had implemented localized closures.

Considering millions of school-going students, and their health and safety, it's time to harness digital platforms judiciously to ensure that their learning does not stop.

UNESCO too suggested that digital learning platforms can help students' access to quality education remotely during times like these.

**Shift to E-learning**

The crisis is always paired with opportunities. And it's time to appreciate the full potential of technology for learning. In the wake of this medical emergency and keeping the students' safety in mind along with their academic concern, different stakeholders in the education space have been endorsing online learning so that the learning only grow and do not recede.

Majority of private schools and other educational institutions have initiated mandatory virtual classes on a daily basis, and thus, teachers are unfailingly sharing their lessons over skype call, zoom call or any other virtual class options to keep the learning on.

Wherever and whenever required, the training is provided to students and teachers through videos to use technology to facilitate virtual classes. Some education institutes are also providing pre-recorded videos of lessons to students where teachers explain the topics extensively. With this uncertainty on the horizon, EdTech players in India have also decided to take it upon themselves to help students stay at home without compromising on their lessons. These companies are creating a breakthrough, offering free access to their courses during a time that typically flags off the exam season. At the same time, the move has been met with an overwhelming response from the students.

**Benefits of E-learning**

The digital learning platforms said the students with full access to the study material as well as allow them to engage in online classes and interact with the teachers like the physical classroom setting. The feedback is encouraging from both teachers and students. Students are abiding by the learning schedule and

submitting their assignments on time. All this contributes to personalized learning of students. There are many other benefits associated with digital or virtual classes, especially promoting students' voice and choice, a flexible learning pace, and the ability to learn anytime, from anywhere. Adaptive learning is one of the techniques for providing personalized learning experiences, to enable effective and tailored learning paths to engage students and address their individual needs.

**Covid-19 outbreak triggering the new education revolution**

Ironically, it has taken a pandemic like Covid-19 outbreak to get the education sector to swing to digital mode with both human and technical support. The only reason that universities and some schools in districts have been able to march towards remote learning is that technology stack has evolved a good bit in the last four years. The utilization of technology has opened up new opportunities of learning for students of all ages and tossing the traditional notion of classrooms and education by breaking the geographical barrier. Technology has led a pedagogical change while addressing concerns that affect teaching, learning and social functionalities. Till the time this dreaded pandemic gets controlled, it is the digital learning that will bridge the gap between teachers and learners. Stay-at-home learning should continue

**Gratitude**

Finally, the seventh positive aspect that COVID-19 is giving us is a new sense of gratefulness. It has offered us a new perspective on everything we have taken for granted for so long – our freedoms, leisure, connections, work, family and friends. No one have imagined or questioned how life as we know it could be suddenly taken away from us. Fortunately, when this crisis is over, all nations will exhibit new levels

of gratitude. The society have also learned to value and appreciate health workers effort, who are at the frontline of this crisis, risking their lives everyday by just

showing up to their vital work. This sense of gratefulness can also help us develop our resilience and moral strength to overcome the crisis in the long- term. (psychologytoday.com, 2020), (berkeley.edu, 2020)

**Negative impacts of covid-19**

**Environment**

COVID 19's impact on the environment has been mixed. Although the pandemic resulted in improved environmental conditions, there have been other negative effects, some of which are obvious, others less so. In brief, the positive effects have been reduced GHG (greenhouse gas) emissions, improved water quality, reduced noise pollution, improved air quality and in some cases, wildlife restoration. Negative effects have been increased medical waste, haphazard disposal of PPE, increased municipal waste and reduced recycling efforts. (gage, The Coronavirus Pandemic's Impact on them Environment, 2020)

Masks: 129 billion are disposed globally each month Gloves :65 billion are disposed globally each month

The drastically increasing amount of domestic and medical waste is one of the key negative outcomes of COVID-19. Coronavirus waste became a new form of global pollution. The adopted quarantine, isolation, and social distancing led to a corresponding increase in the amount of solid household waste (15-25%) and a significant increase in the generation of medical waste in healthcare institutions (from 10 to 20 times).

On waste management — [August 2020]; Media overview Coronavirus waste has become a new form of global pollution. The adopted quarantine, isolation, and social distancing led to a corresponding increase in the amount of solid household waste (15-25%) and a significant increase in the generation of medical waste in healthcare institutions (from 10 to 20 times). To protect themselves from the viral infection, people are using face masks, hand gloves, and other safety equipment, which increases the amount of healthcare waste. Face masks are non-recyclable, they are contaminated with body fluids and could potentially lead to indirect infection and transmission of the virus if released into the recycling system.

From the beginning of 2020, a huge number of disinfectants has been applied to roads, commercial, and residential areas to exterminate the COVID-19 virus. These disinfectants can kill non-targeted beneficial species and create ecological imbalance. Much of the disinfectants and antiseptics, such as hand soap which contains a high percentage of the hormone-disrupting pesticide Triclosan (TSC -Triclosan converts to dioxin, a highly toxic compound when exposed to sunlight), is naturally finding its way into our water systems.

COVID-19's increased waste also affected waste management (WM) systems. Reduced employment / workers reduced recycling efforts which further

compounded challenges in the collection and disposal of general waste. Municipal budgets were weakened as a result of increased healthcare costs, and implemented social security regulations. Several governments introduced limitations to the volume of recycling activities in order to reduce the risk of virus infection. (Survey on the impact of the COVID-19 on municipal waste management systems, [2020])

COVID-19 is the latest of several recent zoonotic diseases1 in humans and demonstrates how human health and nature are closely intertwined. Interaction with nature could expose humans to a range of animal diseases. In fact, about three to four new infectious diseases occur every year, most of which originate from wild animals. Over the past 30 years, approximately 60-70% of new human diseases have been of zoonotic origin. The growth of zoonotic disease outbreaks is a sign of a breakdown in the relationship between humans and nature and is likely to worsen.

**2. Education**

The global impact of Coronavirus is immense as educational institutes all over the world – from Harvard to the IITs – are closed. Covid-19 has thrown education all over the world in a loop. Here are the major problems. Schools are shut, and students are stranded at home, with extremely limited contact with friends and virtually no physical activity, thanks to the Covid-19 pandemic raging across the world. IB, A Levels, ICSE, CBSE all known and recognized boards have postponed or cancelled examinations. Likewise, top colleges like MIT, Harvard, Princeton have closed. Closer home, institutions like IITs and IIMs have all closed their campuses and moved classes online. Even standardized tests like GMAT, GRE, SATs, ACT remain suspended and the future of many students hangs in balance! Clearly, there is panic all around and educators and students alike are confused as to next steps and continuity with respect to educational objectives. In our opinion there are three major education problems that students and educators currently face due to the Covid-19 pandemic. (Indiatoday.in/education-today/featurephilia/story, 2020)

The world today is facing the biggest public health risk which is leading to one of the largest and the quickest reorganization of the world order. By the end of March 2020, the epidemic had spread to over 185 countries and resulted in the closure of over 90 percent of all schools, colleges and universities impacting close to 1.38 billion students. The speed of the spread of the epidemic, the closure of higher education institutions and the transition to online teaching was so swift that it hardly gave any time to plan and to reflect on the potential risks or the potential opportunities that such a sudden change could bring.

Given such a situation it is important to look at the impact and reflect on what has transpired and what is likely to happen as we move forward in the field of global education.

**Four negative impacts of Covid-19 on education:**

There are a number of areas of potential risks for global education. Here are 4 negative impacts of Covid-19 on education:

### 2. 1. Sluggish cross-border movement of students

Universities in many countries such as Australia, UK, New Zealand, and Canada are highly dependent on the movement of students from China and India. Many parents will avoid sending students abroad for higher education due to high risk from the pandemic.

### 2. 2. Passive learning by students

The sudden shift to online learning without any planning -- especially in countries like India where the backbone for online learning was not ready and the curriculum was not designed for such a format -- has created the risk of most of our students becoming passive learners and they seem to be losing interest due to low levels of attention span.

Added to this is that we may be leaving a large proportion of the student population untouched due to the digital divide that is part of many developing nations including India.

We are now beginning to realize that online learning could be dull as it is creating a new set of passive learners which can pose new challenges.

### 2. 3. Unprepared teachers for online education

Online learning is a special kind of methodology and not all teachers are good at it or at least not all of them were ready for this sudden transition from face-to-face learning to online learning. Thus, most of the teachers are just conducting lectures on video platforms such as Zoom which may not be real online learning in the absence of a dedicated online platform specifically designed for the purpose.

### 2. 4. Changing format of student recruitment

Universities and colleges worldwide are facing a major risk in the area of student recruitment and retention. The risk of losing students is so high that they will need to re-look at their admission practices, admission criteria and the overall recruitment process itself which will include, new methods of outreach and application process itself. Many schools, colleges and universities switched to platforms from the likes of Microsoft and Google along with various conferencing apps such as skype, zoom, google meet, for conducting online classes. A shift in the teaching methodology is being observed at-large. A large number of private schools in urban cities made arrangements and trained teachers to teach communicate and engage with students in online classes. These e-learning programs have been designed to improve communication with each other. While learning through tutorials, video calls, sharing

screens and enabling learning software, help students make the most of their virtual learning experience.

**Underprivileged students are lagging behind in the age of digital learning.**

However, a large section of students from underprivileged/ backward families or living in remote areas don't have access to the internet. Moreover, a considerable fragment of teachers and students are not equipped to configure the online class model to teach. So, we really have to look at democratizing education. At the end of the day, students, irrespective where they are and how old they are, learning should never stop. As an immediate response to the medical crisis, adaptability towards digital learning has been accelerated.

**Classroom environment is best for learning.**

However, a physical classroom environment and interaction has been perceived as the best form of teaching-learning method. Though globally, online education has witnessed some success, in India and most third world countries, digital learning would still take time before it is seen as a mainstream learning style. However, the Covid-19 outbreak, and the resultant lockdown, has forced the adoption of digital education amongst the learners. The hope is, it might as well lead to newer teaching-learning patterns that could prove to be more effective and efficient in the long run.

**Other negative impacts on education**

As the world becomes increasingly interconnected, so do the risks we face. The COVID-19 pandemic has not stopped at national borders. It has affected people regardless of nationality, level of education, income or gender. But the same has not been true for its consequences, which have hit the most vulnerable hardest. Education is no exception. Students from privileged backgrounds, supported by their parents and eager and able to learn, could find their way past closed school doors to alternative learning opportunities. Those from disadvantaged backgrounds often remained shut out when their schools shut down. This crisis has exposed the many inadequacies and inequities in our education systems – from access to the broadband a computer needed for online education, and the supportive environments needed to focus on learning, up to the misalignment between resources and needs.

The lockdowns in response to COVID-19 have interrupted conventional schooling with nationwide school closures in most OECD and partner countries, the majority lasting at least 10 weeks. While the educational community have made concerted efforts to maintain learning continuity during this period, children and students have had to rely more on their own resources to continue learning remotely through the Internet, television or radio. Teachers also had to adapt to new pedagogical concepts and modes of delivery of teaching, for which they may not have been trained. In particular, learners in the most marginalised groups, who don't have access to digital learning resources or lack the resilience and engagement to learn on their own, are at risk of falling behind.

Hanushek and Woessman have used historical growth regressions to estimate the long-run economic impact of this loss of the equivalent to one-third of a year of schooling for the current student cohort. Because learning loss will lead to skill loss, and the skills people have related to their productivity, gross domestic product (GDP) could be 1.5% lower on average for the remainder of the century. The present value of the total cost would amount to 69% of current GDP for the typical country. (EA Hanushek L. W., 2008), (EA Hanushek L. W., 2007), (EA Hanushek L. W., 2007).

These estimates assume that only the cohort currently in school are affected by the closures and that all subsequent cohorts resume normal schooling. If schools are slow to return to prior levels of performance, the growth losses will be proportionately higher. Of course, slower growth from the loss of skills in today's students will only be seen in the long term. However, when considered over this term, the impact becomes significant. In other words, countries will continue to face reduced economic well-being, even if their schools immediately return to pre-pandemic levels of performance. For example, for the United States, if the student cohorts in school during the 2020 closures record a corona-induced loss of skills of one-tenth of a standard deviation and if all cohorts, thereafter return to previous levels, the 1.5% loss of future GDP would be equivalent to a total economic loss of USD 15.3 trillion. (Woessmann L. (2007), (Hanushek Eric A., Ludger W. 2007)

The COVID-19 pandemic has also had a severe impact on higher education as universities closed their premises and countries shut their borders in response to lockdown measures. Although higher education institutions were quick to replace face-to-face lectures with online learning, these closures affected learning and examinations as well as the safety and legal status of international students in their host country. Perhaps most importantly, the crisis raises questions about the value offered by a university education which includes networking and social opportunities as well as educational content. To remain relevant, universities will need to reinvent their learning environments so that digitalisation expands and complements student-teacher and other relationships. Reopening schools and universities will bring unquestionable benefits to students and the wider economy. In addition, reopening schools will bring economic benefits to families by enabling some parents to return to work. Those benefits, however, must be carefully weighed against the health risks and the requirement to mitigate the toll of the pandemic. The need for such trade-offs calls for sustained and effective coordination between education and public health authorities at different levels of government, enhanced by local participation and autonomy, tailoring responses to the local context. Several steps can be taken to manage the risks and trade-offs, including physical distancing measures, establishing hygiene protocols, revising personnel and attendance policies, and investing in staff training on appropriate measures to cope with the virus.

## Peace

The COVID-19 pandemic has impacted politics, both international and domestic, by affecting the governing & political systems of multiple countries, causing suspensions of legislative activities, isolation or deaths of multiple politicians and rescheduling of elections due to fears of spreading the virus. The pandemic has triggered broader debates about political issues such as the relative advantages of democracy and autocracy, how states respond to crises, politicization of beliefs about the virus, and the adequacy of existing frameworks of international cooperation. Additionally, the pandemic has, in some cases, posed several challenges to democracy, leading to it being fatally undermined and damaged. (Ang, Yuen Yuen (2020), (Stasavage, David (2020), (Lipscy, Phillip (2020),( Druckman, James; Klar, Samara,2020), (Fazal, Tanisha (2020

The coronavirus pandemic appears to have worsened conflict dynamics: it has also led to a United Nations Security Council resolution demanding a global ceasefire. On March 23, 2020, United Nations Secretary-General António Guterres issued an appeal for a global ceasefire as part of the United Nations' response to the COVID-19 coronavirus pandemic. On 24 June 2020, 170 UN Member States and Observers signed a non-binding statement in support of the appeal, rising to 172 on 25 June 2020. On 1 July 2020, the UN Security Council passed resolution S/RES/2532 (2020), demanding a "a general and immediate cessation of hostilities in all situations on its agenda," expressing support for "the efforts undertaken by the Secretary-General and his Special Representatives and Special Envoys in that respect," calling for "all parties to armed conflicts to engage immediately in a durable humanitarian pause" of at least 90 consecutive days, and calling for greater international cooperation to address the pandemic. (Mustasilta, Katariina (2020),(United Nations Secretary-General. 23 March 2020) ( United Nations News. 23 March 2020),(UN News. 24 June 2020).

## Connectedness

During periods of turmoil such as the Covid-19 pandemic, firms with more resilient business models tend to survive and expand more than others. While global production and export networks expose firms to foreign pandemic shocks, they potentially make firms less susceptible to domestic pandemic shocks through diversification of suppliers and markets. In addition, higher market power could provide buffers by allowing bigger margins of adjustment. The recent COVID-19 pandemic has influenced our society in various ways. In particular, changes in business environments induced by border closures, lockdown policies, social distancing, and preference changes have generated a spike in uncertainty, significant disruptions in business, and a reallocation across firms. (Baker S R, Bloom N, Davis S J and Terry S J (2020), (Barrero, J M, N Bloom and S J Davis (2020),( Ding, Levine W R, Lin C and Xie W (2020).

During periods of such turmoil, firms with more resilient business models tend to survive and expand more than others, which leads to an important question of what

characteristics of firms are vital in managing crises. The recent publication attempts to answer this question with particular emphasis on two firm characteristics — global connectedness and market power — which play central roles in the economics and finance literature, and have attracted a great deal of attention in the last decade. (Hyun J, Kim D and S- Shin R (2020).

**Global integration: Necessarily bad during the pandemic?**

The global economy has so far evolved toward integration through global value chains, trade, and migration, and there is now a consensus in the media and policy circles that global integration has exacerbated the negative impact of the pandemic crisis, both through the direct spread of the disease and through the disruption in foreign supply and demand. From a theoretical point of view, however, more globally connected firms via supply chains and exports could enjoy a more diversified portfolio of suppliers and markets, which would potentially allow them to buffer negative domestic shocks by making more flexible decisions in production and market management. Another firm characteristic, market power (which we measure through mark-up), could also make firms more resilient to negative shocks by providing bigger margins of adjustment and flexibility, as a large degree of mark-up implies that the firms' products are not easily substituted for others, allowing the firms to adjust prices without a significant decline in demand.

(Baker S R, Bloom N, Davis S J and Terry S J (2020).

Descriptive evidence: Firms with higher global connectedness and market power performed better in stock markets

Using a weekly global stock market dataset of covering 8,000 listed firms in 71 countries for the first five months of 2020, we investigate how pre-pandemic firm characteristics, including global connectedness and market power, affect firms' stock market performances in response to the COVID-19 pandemic shock. We primarily focus on a firm's market value, which equates to the present value of the expected future stream of profits (or dividends). (Barrero J M, Bloom N and Davis S J (2020)).

Thus, changes in stock market value reflect investors' information about firms' current and future performances, shows the evolution of the average market value of the US firms as a function of their degree of global connectedness (measured by foreign supplier share and export share) and market power (measured by mark-ups). Specifically, we group firms separately across those in the top and bottom quantiles of scores, foreign supplier share, and export share distributions. Firms with higher profits and who are more globally integrated through supply chains and exports, differentially performed better compared to those with lower mark-ups and who are less globally integrated. This descriptive exercise suggests that global production and export networks as well as profits potentially allow firms to be more resilient during crisis periods. (Bonadio

B, Huo Z, Levchenko A A and Pandalai-Nayar N (2020).

Regression Analysis: Global connectedness and market power make firms more resilient to the domestic pandemic shock

The result confirms carried out using a formal regression analysis. Specifically, the regress of firm's weekly market value growth on various explanatory variables, including the domestic pandemic shock measured by weekly growth rate in domestic total confirmed cases and its interaction with various pre- pandemic firm characteristics, including measures of global connectedness through global supply chains and exports, mark-ups as a measure of market power, employment, and various financial conditions. Also control for measures of foreign pandemic shocks, any time-varying and time-invariant industry and/or country differences that might influence stock market reactions to the pandemic, as well as time-invariant unobserved firm characteristics. (Ding W, Levine R, Lin C and Xie W, 2020).

First, consistent with widely accepted views, global supply chain and exports negatively affect firms' market value by transmitting foreign pandemic shocks. However, we find a significant heterogeneous response to the domestic pandemic shock: firms with larger foreign supplier share, export share, and mark up experience smaller decrease of weekly market value growth in reacting to the domestic pandemic shock. This result is consistent with the view that global connectedness and market power make firms more resilient to domestic shocks by diversifying the markets and suppliers and by providing more flexibility and margins of adjustment in response to negative shocks. (Gormsen N J and Koijen R S J ,2020).

**Innovation**

Countries that implement similar (Centres for Disease Control) CDC-style recommendations in relation to COVID-19 may experience less dislocation, although there may still be an economic impact. School closures and social distancing might reduce the available labour force in an area experiencing a pandemic, for example. We might then observe mild rolling economic impacts as outbreaks occur in various regions. A severe public reaction in which local authorities or people themselves decide on extremely strict measures in a given area could create significant economic costs, particularly in regions and for industries that specialize in production that can't be done virtually (such as manufacturing). If many countries opt for this type of response, the impact on the global economy could be quite large.

Economic centres around the world are subject to Wuhan-style shutdowns as people panic over the spread of the virus. Uncoordinated decisions on a country-by-country basis disrupt the movement of both people and goods. Global manufacturing declines, as businesses with international supply chains can operate only intermittently. Tourism and related businesses decline sharply, and tourism-based businesses and regions suffer. It takes more than a year for the World Health Organization and the United Nations to develop an accepted global response that prioritizes health measures based on effectiveness and cost to the wider economy, and for this response

to be accepted in the major world economies. Global GDP stagnates, international trade falls, and a global recession is a distinct possibility.

Delayed shipments and production schedules create financial problems for companies with heavy debts, especially in the United States. The decline in global equity markets and flight from risk—investors selling assets such as high-yield bonds and volatile stocks—exposes investors who have under-priced risk. Concern about counterparty risk accelerates the decline and dries up liquidity in financial markets. Central banks scramble to manage the problem. Financial markets—and the global economy—recover after a V- shaped recession. The coronavirus recession is an economic recession happening across the world economy in 2020 due to the COVID-19 pandemic. (https://www2.deloitte.com/2020), (Schwartz, Nelson D. (21 March 2020),( Horowitz, Julia , March 2020),( Lowrey, Annie (9 March 2020).

Global stock markets experienced their worst crash since 1987, and in the first three months of 2020 the G20 economies fell 3.4% year-on-year. Between April and June 2020, the International Labour Organization estimated that an equivalent of 400 million full-time jobs were lost across the world, and income earned by workers globally fell 10 percent in the first nine months of 2020, equivalent to a loss of over US$3.5 trillion. (Jenkins, Simon (9 March 2020)), (OECD. 11 June 2020)), (McKeever, Vicky (30 June 2020)).

**Conclusion and Summary**

At the end of 2019, a novel coronavirus, designated as SARS-CoV-2, (Severe Acute Respiratory Syndrome-CoV-2). emerged in Wuhan, China and was identified as the causal pathogen of COVID-19. The epidemic scale of COVID-19 has increased dramatically, with confirmed cases increasing across China and globally. Understanding the potential affecting factors involved in COVID-19 transmission will be of great significance in containing the spread of the pandemic. Environmental and meteorological factors might impact the occurrence of COVID-19, as these have been linked to various diseases, including SARS

A series of strict lockdown measures were implemented in the areas of China worst affected by coronavirus 19 disease, including Wuhan, to prevent the disease spreading this was implemented globally all over the world as the pandemic speedily spread. The lockdown had a substantial environmental impact, because traffic pollution and industrial emissions are important factors affecting air quality and public health in the region. Restrictive measures in different regions according to the level of the epidemic spread.

These measures included reducing public transportation and closing schools and business centres. These quarantine measures effectively alleviated the spread of the COVID-19 epidemic.

Global impact of covid-19 on education was very immense. The speed of the spread of the pandemic, the closure of schools, colleges, higher education institutions and the

transition to online teaching was so quick that there was no time to plan and to reflect on the potential risks or the potential opportunities that such a sudden shutdown could bring. Given such a situation it is important to look at the impact and reflect on what has transpired and what is likely to happen as we move forward in the field of global education.

The world of work is being profoundly affected by the global virus pandemic. In addition to the threat to public health, the economic and social disruption threatens the long-term livelihoods and wellbeing of millions. The coronavirus disease continues to spread across the world following a trajectory that is difficult to predict. The health, humanitarian and socio-economic policies adopted by countries will determine the speed and strength of the recovery.

The spread of COVID-19 has sent shockwaves across the globe. The public health crisis, unprecedented in our lifetimes, has caused severe human suffering and loss of life. The exponential rise in infected patients and the dramatic consequences of serious cases of the disease have overwhelmed hospitals and health professionals and put significant strain on the health sector. As governments grappled with the spread of the disease by closing down entire economic sectors and imposing widespread restrictions on mobility, the sanitary crisis evolved into a major economic crisis which is expected to burden societies for years to come. According to the OECD's [Organisation for Economic Co-operation and Development] latest Economic Outlook, even the most optimistic scenarios predict a brutal recession.

Even if a second wave of infections is avoided, global economic activity is expected to fall by 6% in 2020, with average unemployment in OECD countries climbing to 9.2%, from 5.4% in 2019. In the event of a second large-scale outbreak triggering a return to lockdown, the situation would be worse. (OECD, 2020). (WHO int/news2020)

The outlook is very uncertain. But, if anything, the pandemic has exposed our vulnerability to crises and revealed how precarious and interdependent the economies we have built can be. Disruptions on the scale we have just witnessed are not limited to pandemics, but may also result from natural, political, economic and environmental disorder. Our capacity to react effectively and efficiently in the future will hinge on governments' foresight, readiness and preparedness. Through their role in developing the competencies and skills needed for tomorrow's society, education systems will need to be at the heart of this planning. This includes rethinking how the economy should evolve to guard against adversity, and defining the skills, education and training required to support it. This also means working in close collaboration with other government sectors and the private sector to increase the attractiveness and labour-market prospects of certain professions, including those considered paramount for the common good. Real change often takes place in deep crises, and this moment holds the possibility that we won't return to the status quo when things return to "normal". While this crisis has deeply disruptive implications, including for education, it does not have predetermined outcomes. It will be the nature of our

collective and systemic responses to these disruptions that will determine how we are affected by them. In this sense, the pandemic is also a call to renew the commitment to the Sustainable Development Goals. Ensuring that all young people have the opportunity to succeed at school and develop the knowledge, skills, attitudes and values that will allow them to contribute to society is at the heart of the global agenda and education's promise to our future society.

Whether we close our boarder we cannot help but joined our forces together or we might be overtaken by the scourge of this new vicious murderous viral disease. We may close our boarder but we cannot close it from the airborne viral disease. Only time can tell whether the strategies being employed by most countries is indeed effective. It is a treacherous disease; you may seem to fully get well but it could return with more serious complication out of nowhere.

We become introspective and concern not only for ourselves but for everyone. Because we need to eradicate the disease not human beings. This disease does not respect you race or economic standing.

The current crisis has tested our ability to deal with large-scale disruptions. It is now up to us to build as its legacy a more resilient society.

**How COVID-19 affected the future of work**

The short and long-term disruptions to work and employment sectors from COVID-19 vary. During the pandemic, the virus most severely disturbed the work sectors with the highest physical proximity score: medical care, on-site customer service, personal care, and leisure and travel. The leisure and travel sector including restaurants, airports, and entertainment venues were hugely impacted on. Workers in these fields require daily interaction with crowds of new people. COVID-19 forced most of these venues to close in 2020 and airports and airlines were operating in severely limited capacity. In the longer term, reduction in business travel due to the shift to remote work and the automation of some occupations, such as food service roles, may impose a restriction on labour demand in this arena and therefore a rise in unemployment levels. Remote work may also put a dent in business travel as the extensive use of videoconferencing during the pandemic has ushered in a new acceptance of virtual meetings in most aspects of work. While leisure travel and tourism are likely to rebound after the crisis, McKinsey's travel practice estimates that about 20 percent of business travel, the most lucrative segment for airlines, may not recover. This would have significant knock-on effects on employment in commercial aerospace, airports, hospitality, and food service.

The computer-based office work sector, including offices and administrative roles in hospitals, courts, and factories, require only moderate number of human interactions and therefore nearly all of these roles became remote and there are potential talks that these may remain remote roles due to the benefits of cut in costs for building and maintenance fees for employers.

COVID-19 had little impact on the outdoor production and maintenance sector such as construction sites, farms, residential and commercial grounds, and other outdoor based work roles due to the low physical proximity with other people and the fact that the roles take place fully outdoors where essentially there is natural ventilation and lower risk of virus transmission.

Many consumers discovered the convenience of e-commerce and other online activities during the pandemic. In 2020, the share of e-commerce grew at two to five times the rate before COVID-19. Roughly three-quarters of people using digital channels for the first time during the pandemic say they will continue using them when things return to "normal" according to McKinsey Consumer Pulse surveys conducted around the world. This shift to digital transactions has propelled growth in delivery, transportation, and warehouse jobs. In China, e-commerce, delivery, and social media jobs grew by more than 5.1 million during the first half of 2020. COVID-19 may propel faster adoption of automation and AI (artificial intelligence), especially in work sectors with high physical proximity. Many companies deployed automation and AI in warehouses, grocery stores, call centres, and manufacturing plants to reduce workplace density and cope with surges in demand. (Susan Lund, 2020)

## Discussion

It is important that we realise the long-term impact of Covid-19, and not just the immediate effects.

Responsible organisations such as the WHO [World Health Organisation], and other scientific and medical commissions should guide and support the work carried out by scientists, and medics in tackling the most challenging aspects of the pandemic's legacy in building a better future for countries around the world. The positive and negative impact of Covid-19 on the environment has been mixed. Although the pandemic has caused an improvement in environmental conditions, there are also negative effects, some are known and others less obvious. Briefly the positive impact was the reduction in GHG (greenhouse gas) emissions, which improved the quality of environmental conditions, such as improved air quality, reduced noise pollution and wild life restoration. Negative effects included increased medical waste, hazard disposal of PPE (personal protection Equipment), increased municipal waste and reduced recycling process. The world has agreed on an international inquiry into the origins of the virus, handling and response of the pandemic, however the outcome of this is likely to be many years away. Advances in medicine have kept many epidemics manageable, many speculated that it was only a matter of time before a global pandemic of this magnitude was to take place. There have been so many more direct and indirect effects of the COVID-19 pandemic, of which will be understood in the months and even years to come, but what is evident in the short-term, is that all of us should urgently stand up and work out how we can play our part in protecting and rehabilitating the world's biodiversity which is currently balancing on a very delicate thread.

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# Anxiety as a Personality Trait and Anxiety State, During Coronavirus Covid-19 Pandemic Outbreak among Adult Population

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## Abstract

The COVID-19 outbreak has warranted a significant influence on our mental health, hence monitoring and following this issue should be a top priority to most of the researchers worldwide. It is essential to protect our mental health and to develop appropriate interventions during this global crisis. Therefore, our study aims to help our population by understanding their emotional, behavioral changes and the overall impact that the fear and insecurity from coronavirus has brought to our lives. The purpose of this study was to investigate the prevalence of anxiety as a state vs. anxiety as a personality trait and factor differences amid coronavirus COVID-19 pandemic outbreak. The survey included 279 respondents, out of which 213 were females and 66 males, age range from 18 to 50 years old. For data collection we have used the 'snowball' sampling technique, which is an online software platform, called Survey Planet. To measure the levels of anxiety we have utilized the STAI – state- trait anxiety inventory. To analyze the data we used the SPSS 22.0. Our findings suggest that demographic factors and basic personal data, such as age, marital status, academic level, employment status etc., create the diversity among the population, with the way they experience and how they feel toward this new mental health challenge. With this research we tend to actualize the adult's mental health and to increase the proper weight on the issue by elevating population awareness and attention toward this problem. The world is facing with a new mental health trend, therefore changes in the mental state of every person are worthy of our attention!

**Keywords:** anxiety, coronavirus anxiety, pandemic outbreak, mental health, anxiety disorder.

## Introduction

The declaration of COVID-19 Pandemic by the World Health Organization on March 11, 2020, brought several impacts for all countries on the planet. To address this serious and exceptional situation, the Government of North Macedonia declared on March 11th the state of alarm to manage the health crisis caused by the COVID-19.

The lockdown brought not only economic and political issues; it also brought social, emotional, and behavioral impacts.

Regarding the outcomes of researches made worldwide, which have highlighted the increase of family conflicts and the rise of the domestic violence; the increase of number of people that have fallen to extreme poverty due to the economical disruption; the increase of the presence of anxiety and depressive symptoms among people and the worsening of the mental health state of patients with chronic diseases as well; the social distance, employment and many other social and lifestyle changes due to the pandemic outbreak, brought quite a psychological distress and symptoms of mental illness among the population.

Psychologists and mental health professional speculate that the pandemic will affect the mental health of the global population with increasing cases of depression, suicide, and self-injury, apart from other symptoms reported globally for COVID 2019. Closing outlets that sell alcohol also causes symptoms withdrawal and suicide by alcoholics, reported in countries like Kerala in India. They speculate about the possibility of developing neurotic disorders such as ***generalized anxiety disorder*** and obsessive-compulsive disorder (OCD) in large population groups. Also related to mood and emotional outburst especially panic, fear, avoidance and fear of meeting others, fear of death (Thanatophobia), fear of isolation, stigmatization, fear of not even getting important items, food, etc., may have psychological manifestations.[1]

Psychosocial stressors related to pandemics include threats to the health of self and loved ones, lockdowns, social distancing, separation from family and friends, death of loved ones, social isolation due to quarantine, shortages of food and medicines, loss of earnings, closure of educational institutions and industries, and cancellation of functions and festivals.[23]

Experience of the recent past tells us that the psychological effects of pandemics are often larger than the medical effects. [4]Pandemic-related psychosocial stressors may trigger or exacerbate psychiatric disorders, including mood disorders, ***anxiety disorders***, substance use disorders, and posttraumatic stress disorder (PTSD).[56] Bereave mentor loss of loved ones in the pandemic may be followed by complicated

[1] Setiati, S., Azwar, M. K. (2020). *COVID 19 and Indonesia. Acta medica indonesiana* -The Indonesian journal of Internal medicine' Vol 2, N0.1.
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grief or a depressive episode. Exposure to widespread mortality, including the deaths of loved ones in the pandemic, may result in PTSD.[1]

Finally, as the pandemic develops, the number of infected people grows; anxiety becomes more evident and increases among the population causing intense fear, insecurity, confusion, social relation issues etc.

**Literature Review**

The COVID-19 pandemic found most world populations unprepared, not only in terms of the health threat and demands on the medical system, but also in terms of individuals coping with social distancing measures that disrupted daily routines, limited interpersonal communication, and restricted the availability of social support (Brailovskaia & Margraf, 2020: Brooks et al., 2020).

Compared to highly structured situations eliciting similar responses in individuals with diverse personality characteristics, this unprecedented and exceptionally uncertain situation may bring about stronger spontaneous reactions of the individual reflecting their enduring dispositional characteristics (Judge & Zapata, 2015). Anxiety as a trait for instance, can affect in the way of how the individuals experience anxiety as a state, due to the novel coronavirus, or that it may be a trigger to another mental health disturbance, such as depression; or other types of anxiety such as social anxiety, panic disorder and even post traumatic stress disorder, after the novel of coronavirus is over.

Given the current worldwide concern over the spread of the COVID-19, people are faced with several mental health implications. Anxiety is one disorder that is on the top of mental health disturbances during pandemic coronavirus COVID-19, referring to many researches that have been conducted worldwide regarding this mental issue. In Iran, for instance, a survey conducted among college students have come to a conclusion that 35 % of the students experienced moderate to extreme levels of anxiety (Khoshaim, B. K., et al. 2020.) [2]

Some socio-demographic factors are also closely linked with psychological outcomes. For example, it was found that female gender was a risk factor for depressive and anxiety symptoms (Zhou, Zhang et al., 2020). Another factor that puts mental health at risk is the uncertainty about being infected or infecting family and friends further heighten the levels of *anxiety* (Fiorillo and Gorwood, 2020; Jahanshahi et al, 2020; Maunder et al., 2003;Shigemura et al., 2020).

Economic downfall also seems to affect anxiety and anxiety-related behaviors. Cao et al., (2020) discovered that the report anxiety of college students is associated with

[1] Shultz, J.M., Espinel, Z., Flynn, S.W., Hoffmann, Y., Cohen, R.E. (2008). DEEP PREP: All-Hazards Disaster Behavioral Health Training. Miami, FL: DEEP Center.
[2] Zhou, Zhang et al., (2020). *Prevalence and socio-demographic correlates of psychological health problems in Chinese adolescents during the outbreak of COVID-19.* European Child & Adolescent Psychiatry, 29 (2020), pp. 749-758

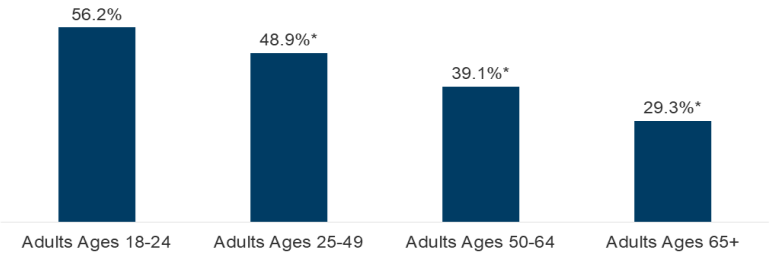
parental income as well as place of residence. The debilitating effect of economic downfall was also observed among Japanese citizens in a letter by Shigemura et al. (2020). Fear of the unknown may result to *anxiety* for those with preexisting mental health concerns and even for those who are psychologically healthy (Cao et al, 2020; Yaoet al., 2020). This is because mental health care may not be prioritized as the world deals with the biological effects of the pandemic (Fiorillo and Gorwood, 2020).[1]

In a relevant study, concerning the mental health and the crisis during the pandemic outbreak, authors have come to a conclusion "The most common mental issues caused by COVID-19 include anxiety, depression, PTSD, and other findings that were generally consistent with severity."[2]

Throughout the pandemic, anxiety, depression, sleep disruptions, and thoughts of suicide have increased for many young adults. They have also experienced a number of pandemic-related consequences – such as closures of universities, transitioning to remote work, and loss of income or employment – that may contribute to poor mental health. KFF analysis of the Household Pulse Survey finds that throughout the pandemic, a large share of young adults (ages 18-24) have reported symptoms of anxiety and/or depressive disorder – 56% as of December 2020 – compared to older adults.[3]

Figure 3

Share of Adults Reporting Symptoms of Anxiety and/or Depressive Disorder During the COVID-19 Pandemic, by Age




NOTES: *Indicates a statistically significant difference between adults ages 18-24. Data shown includes adults, ages 18+, with symptoms of anxiety and/or depressive disorder that generally occur more than half the days or nearly every day. Data shown is for December 9 – 21, 2020.
SOURCE: U.S. Census Bureau, Household Pulse Survey, 2020.

KFF

[1] Fiorillo, A., & Gorwood, P. (2020). *The consequences of the COVID-19 pandemic on mental health and implications for clinical practice. European psychiatry : the journal of the Association of European Psychiatrists*, *63*(1), e32. https://doi.org/10.1192/j.eurpsy.2020.35

[2]Shamima, A.S., Priyata, D.,et.al. (2020) *COVID-19: Embracing MentalHealth Upshot from the Coronavirus Pandemic Crisis.* Journal of Psychiatry and Psychiatric Disorders 4. pg 328-342.

[3] Panchai, N., Kamal, R., Cox, S., Garfield, R. (February, 2021*) The Implications of COVID-19 for Mental Health and Substance Use.* KFF. available at: https://www.kff.org/report-section/the-implications-of-covid-19-for-mental-health-and-substance-use-issue-brief/#endnote_link_510918-2

Graph.1 Share of adults reporting symptoms of anxiety and/or depressive disorder during COVID-19 pandemic, by age.

Finally we can say that the above mentioned findings from authors and researchers worldwide, regarding the pandemic issue in many aspects and points of view, resulting in different conclusions through analyses of multi dimensional approaches, have given us a head start for the research we were preparing to conduct. The support of these findings have given us a solid ground on what we can lay our hypothesis, and an outline of what to expect from the outcomes of our investigation on mental health, respectively to anxiety as a consequence due to the COVID-19 outbreak and the all the changes that came with it, due to the safety measures that the government set to prevent the further spread of the virus, such as quarantines, setting police hours, social distance and isolation, banning the gatherings etc.

**Purpose of research**

The purpose of this study is set to investigate the prevalence of anxiety (as a state vs. anxiety as a personality trait) and impact factor differences amid coronavirus COVID-19 pandemic outbreak in the North Macedonia population. With this research we tend to actualize the adult's mental health and to increase the proper weight on the issue by elevating population awareness and researchers attention toward this problem.

The world is facing with a new mental health trend, therefore changes in the mental state of every person is worthy of our attention!

**Research tools**

**For the investigation of our research we have used the State Trait Anxiety Inventory** which was developed by psychologists Charles Spielberg, R.L. Gorsuch, and R.E. Lushene. The STAI measures two types of anxiety – state anxiety, or anxiety about an event, and trait anxiety, or anxiety level as a personal characteristic. The inventory consists of 40 questions on a self-report basis.

The inventory was provided in two languages: English and Albanian language for the respondents.

Study Participants:

We had in total 279 participants from different cities and nationalities around the country. Participant's age was limited between 18 to 50+ years old.

Sampling technique

The Snowball sampling technique was used for collecting information from people around the country. The e-questionnaire was distributed by an Online based platform called Planet Survey. The data was collected online for one week in April, 2020.

## Data analyses

We analyzed the data with the statistical software (Statistical Package for Social Sciences) version 22.0 which facilitated the process of organizing data into tables, graphics and charts for the sake of better visualization of the results and their interpretation.

## Research analyses and results

The main aim of this study was to examine the correlation among people that experience state anxiety versus trait anxiety.

*Descriptive Statistics*

| | *Mean* | *Std. Deviation* | *N* |
|---|---|---|---|
| *SAT* | *58.84* | *13.561* | *281* |
| *SAS* | *50.56* | *10.107* | *281* |

Table 1. Descriptive statistics for State Anxiety vs Trait anxiety

*Correlations*

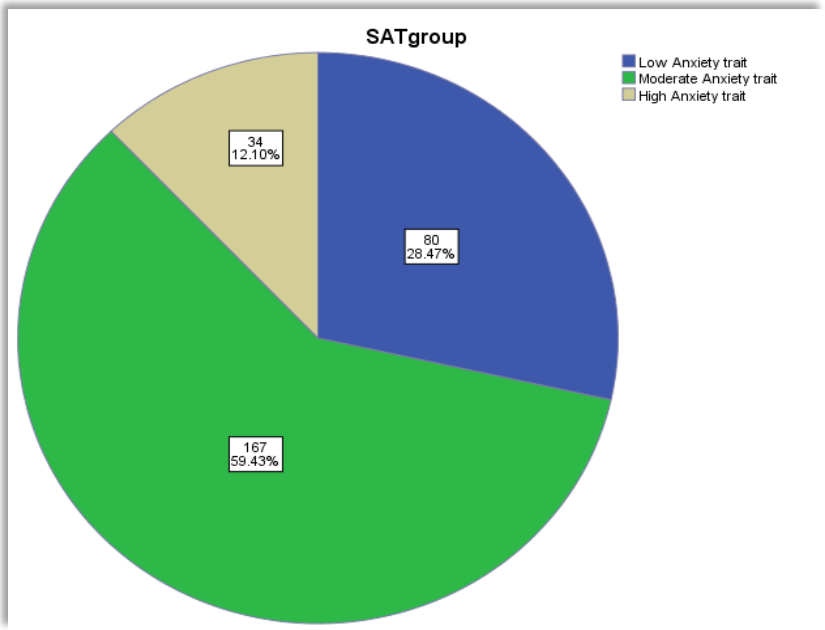
| | | *SAT* | *SAS* |
|---|---|---|---|
| *SAT* | *Pearson Correlation* | *1* | *.649*** |
| | *Sig. (2-tailed)* | | *.000* |
| | *N* | *281* | *281* |
| *SAS* | *Pearson Correlation* | *.649*** | *1* |
| | *Sig. (2-tailed)* | *.000* | |
| | *N* | *281* | *281* |

***. Correlation is significant at the 0.01 level (2-tailed). Table 2.Pearson correlation for ST anxiety*

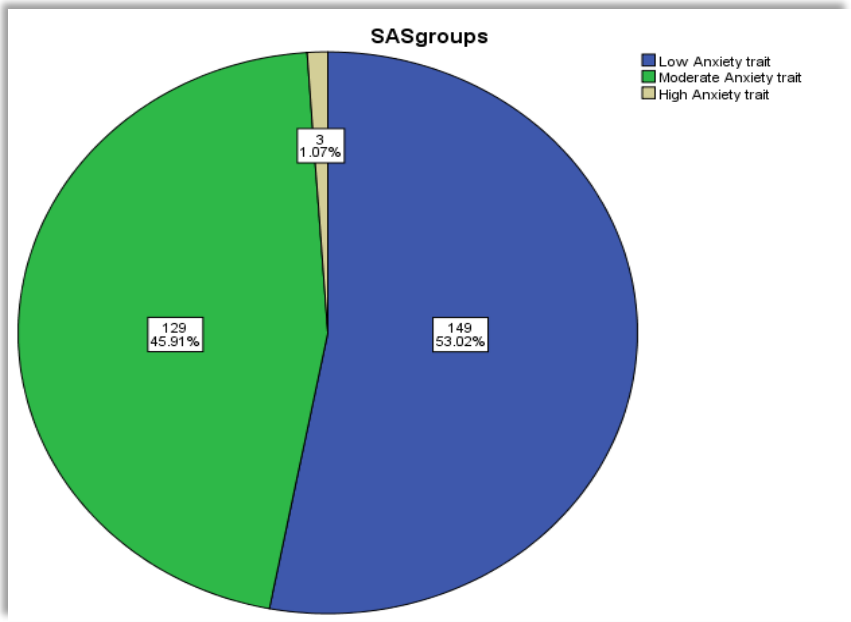
From the Pearson correlation we have come to a conclusion that we have a statistically significant linear relationship ($p <= 0.01$) meaning there is enough evidence to suggest that the correlation we observed does exist in the population. Also the correlation has a high degree ($r=0.65$ ) therefore we conclude that the **correlation is strong**

As we can see in the tables (1 & 2) the direction of the relationship is positive (i.e., trait anxiety and anxiety as a state are positively correlated),($P =0.000$) meaning that these variables tend to increase or decrease together. (people with higher levels of anxiety trait have a tendency to also experience higher levels of state anxiety and vise versa) .

The second aim of my research study is to verify the anxiety levels in our population assuming that the majority of our population suffers from moderate to high levels of anxiety. Regarding this hypothesis we came to these findings.




Graph 1. State Anxiety levels in population




Graph 2. Trait anxiety levels in population

From the graphical representation of data in this pie chart we are looking we can understand right away the thin difference among participants who experience

anxiety in low level 53 %, and moderate level 46%, by leaving behind those who suffer from high levels of anxiety 1%.

We conclude that our findings suggest that the majority of the respondents do not feel anxious about the thread of the novel coronavirus, followed by those who moderately find the thread dangerous for their wellbeing.

From the graphical representation of data in this pie chart we are looking we can visually see that the majority of our respondents have a moderate level of anxiety trait 59.4%, followed by those with low levels of anxiety trait with 28.5%, and the least are those with high levels of anxiety trait represented by 12.1% of our population.

Our findings suggest that the majority of the people tend to experience a moderate tendency to report and experience negative emotions across many situations.

3. Another objective of our research was to explore the gender differences referring to trait vs state anxiety symptoms. We hypothesized that females tend to suffer more from anxiety as a trait and also as a state in comparison to males but we were able to confirm this hypothesis only for the Trait anxiety where as we can see in the table, where are presented the comparable data with the Anova method, regarding the gender, we will see that the means vary significantly $p<0.05$ ($F=0.08$) and we conclude that **gender differences occur referring Trait anxiety,** and fail to prove our hypothesis for the gender differences regarding Anxiety as a state since $F=0.91$, $p>0.05$, meaning there is **no evidence that the there is gender differences.**

*ANOVA*

| | | *Sum of Squares* | *df* | *Mean Square* | *F* | *Sig.* |
|---|---|---|---|---|---|---|
| *SAT* | *Between Groups* | *1284.293* | *1* | *1284.293* | *7.137* | *.008* |
| | *Within Groups* | *50208.817* | *279* | *179.960* | | |
| | *Total* | *51493.110* | *280* | | | |
| *SAS* | *Between Groups* | *1.228* | *1* | *1.228* | *.012* | *.913* |
| | *Within Groups* | *28602.053* | *279* | *102.516* | | |
| | *Total* | *28603.281* | *280* | | | |

Table 3. Anova method for Anxiety as a trait and as a state - gender differences among respondents

4. Regarding the comparatible means by Anova method to determine the age as a factor in experiencing trait and state anxiety we have come to these conclusions: **Middle and early adult agers 30 to 50 years old tend to experience higher levels of anxiety as a trait** followed by the group of early adultohood agers, and leaving behind the late middle agers 50+ years old respondents.

Surprisingly when it comes to Anxiety as a state due to coronavirus thread, **the youngsters** are leading with higher points of anxiety followed by the late adult agers and leaving behind the middle agers and early middle agers.

So far if we compare the means we will see that the reached means do not vary very much, **and there is no clear evidence that there is a statistical significant difference between the means of the groups of ages and the variables,** since F=0.37, p>0.05 for Trait Anxiety and groups of ages and F=0.89, p>0.05 for the State Anxiety , meaning that there is no statistical differences among the means.

*Descriptives*

| | | | | | | 95% Confidence Interval for Mean | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | N | Mean | Std. Deviation | Std. Error | Lower Bound | Upper Bound | Min | Max |
| SAT | 18-29 | 160 | 58.05 | 13.43 | 1.062 | 55.95 | 60.15 | 30 | 89 |
| | 30-39 | 94 | 59.72 | 13.89 | 1.433 | 56.88 | 62.57 | 30 | 89 |
| | 40-50 | 25 | 61.48 | 13.20 | 2.641 | 56.03 | 66.93 | 31 | 84 |
| | 50+ | 2 | 48.00 | 9.899 | 7.000 | -40.94 | 136.94 | 41 | 55 |
| | Total | 281 | 58.84 | 13.56 | .809 | 57.25 | 60.44 | 30 | 89 |
| SAS | 18-29 | 160 | 50.96 | 10.83 | .856 | 49.27 | 52.65 | 30 | 85 |
| | 30-39 | 94 | 49.95 | 9.697 | 1.000 | 47.96 | 51.93 | 33 | 73 |
| | 40-50 | 25 | 50.28 | 6.883 | 1.377 | 47.44 | 53.12 | 41 | 67 |
| | 50+ | 2 | 50.50 | 2.121 | 1.500 | 31.44 | 69.56 | 49 | 52 |
| | Total | 281 | 50.56 | 10.10 | .603 | 49.37 | 51.75 | 30 | 85 |

*ANOVA*

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| SAT | Between Groups | 582.462 | 3 | 194.154 | 1.056 | .368 |
| | Within Groups | 50910.64 | 277 | 183.793 | | |
| | Total | 51493.11 | 280 | | | |
| SAS | Between Groups | 63.232 | 3 | 21.077 | .205 | .893 |
| | Within Groups | 28540.04 | 277 | 103.033 | | |
| | Total | 28603.28 | 280 | | | |

Table 4. Anova method results for age differences among respondents and and State –Trait -anxiety

5. Another objective of our research study was to understand whether the marital status impacts in experiencing state and trait anxiety during the pandemic outbreak.

According to our analyzes through the Anova method we came to a conclusion that there was no difference among the means of the variables, respectively there was no statistically significant difference among the variables of anxiety and marital status

since F=0.25 for Trait anxiety and F=0.95 for State anxiety, which are p>0.05, meaning that there are no difference between the means and we accept the null hypothesis.

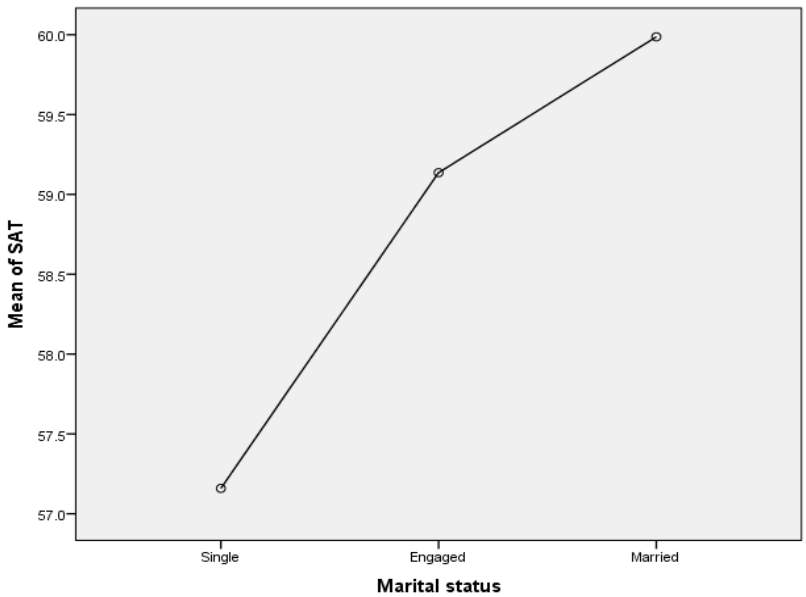
*ANOVA*

| | | *Sum of Squares* | *Df* | *Mean Square* | *F* | *Sig.* |
|---|---|---|---|---|---|---|
| *SAT* | *Between Groups* | *504.247* | *2* | *252.123* | *1.375* | *.255* |
| | *Within Groups* | *50988.8* | *278* | *183.413* | | |
| | *Total* | *51493.1* | *280* | | | |
| *SAS* | *Between Groups* | *250.390* | *2* | *125.195* | *1.228* | *.295* |
| | *Within Groups* | *28352.8* | *278* | *101.989* | | |
| | *Total* | *28603.2* | *280* | | | |

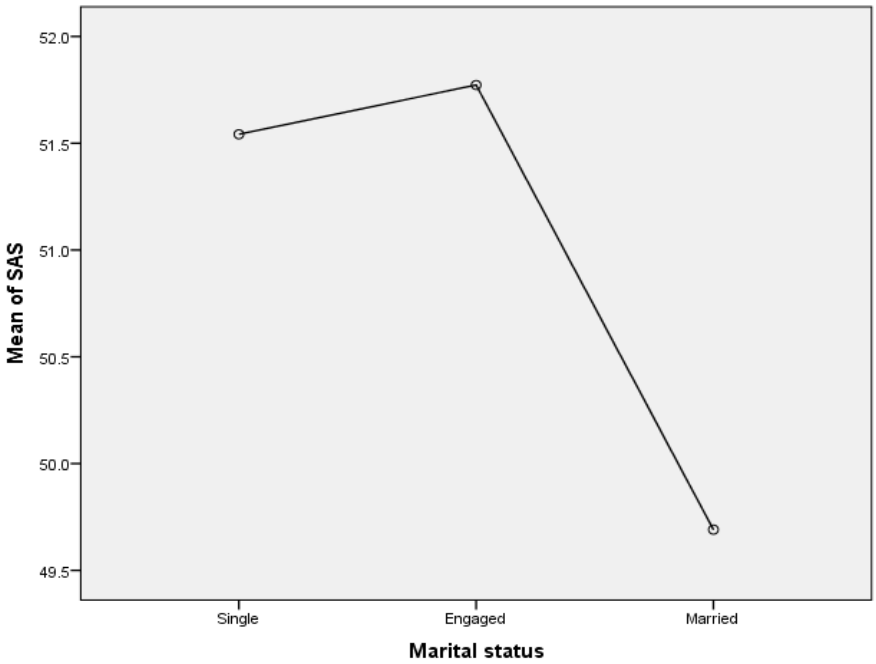
Table 5. Anova method results for marital status and State - Trait anxiety presence

If we look closely to our graphs we would be able to see that slightly higher the Married people have higher levels of trait anxiety, followed by engaged respondents. Single respondents have scored the lowest points in this variable.

Surprisingly quite the opposite happens when we analyze the State anxiety outcomes, where we find the single respondents experiencing higher levels of anxiety due to coronavirus COVID-19, followed by engaged people. The married couples tend to show lower levels of anxiety.




Graph 3. Anxiety as a trait and marital status




Graph 4. Anxiety as a state and marital status

6. Another purpose of our research study is to understand the employment status as a factor that elicits anxiety due to the pandemic outbreak. Our hypothesis stated that unemployed and employed people experience anxiety as a trait and as a state with no significant difference between them.

**According to our findings, we were able to verify our null hypothesis** by using the Anova method, as seen in the table for SAT F=0.307 and SAS F=0.102, p>0.05 meaning that the null hypothesis is accepted and there's no difference between the means of the variables and the employment statuses.

*ANOVA*

| | | *Sum of Squares* | *df* | *Mean Square* | *F* | *Sig.* |
|---|---|---|---|---|---|---|
| *SAT* | *Between Groups* | *192.343* | *1* | *192.343* | *1.046* | *.307* |
| | *Within Groups* | *51300* | *279* | *183.874* | | |
| | *Total* | *51493* | *280* | | | |
| *SAS* | *Between Groups* | *272.711* | *1* | *272.711* | *2.686* | *.102* |
| | *Within Groups* | *28330* | *279* | *101.543* | | |
| | *Total* | *28603.1* | *280* | | | |

Table6. Employment status and State- trait anxiety analysis using ANOVA method

ANOVA

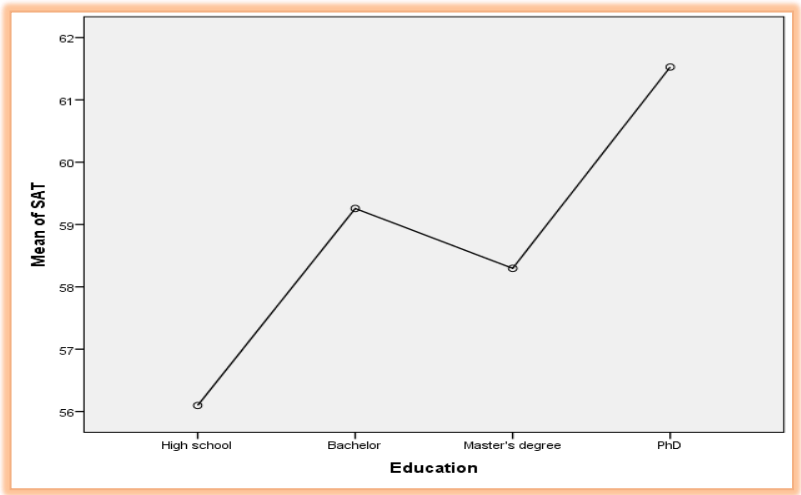
| | | Sum of Squares | Df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| SAS | Between Groups | 574.62 | 3 | 191.542 | 1.893 | .131 |
| | Within Groups | 28028. | 277 | 101.186 | | |
| | Total | 28603. | 280 | | | |
| SAT | Between Groups | 418.37 | 3 | 139.459 | .756 | .519 |
| | Within Groups | 51074. | 277 | 184.385 | | |
| | Total | 51493 | 280 | | | |

Table 7. Anxiety as a state and as a trait analyses referring respondents educational level

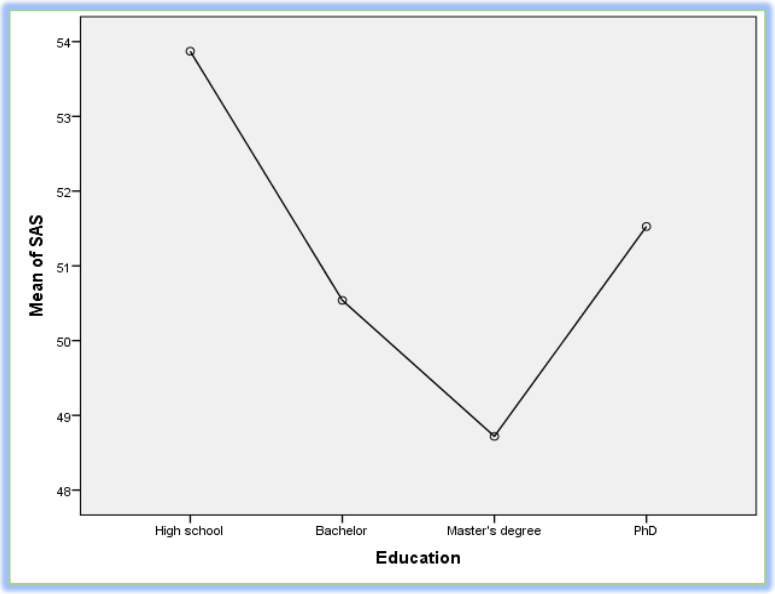
7. The means of the respondents educational level regarding the variables of our study (AS and AT), we can conclude again with the Anova method that the outcomes are greater than the significance level p=0.05 (SAS:F=0.13 and SAT: F=0.52) meaning that we can't reject the null hypothesis, meaning that the means have no statistical significant difference.

When we compare the educational level with the anxiety as a trait variable, we see from the graph above that, high schoolers this time point with the lowest trait anxiety score while the PhD respondents score the highest.

If we look at the graph we may see a detailed view over the slight differences among the variables (Education level and AS) and we see that high schoolers point with the highest scores of anxiety as a state, followed by the other edge of the educational level, the group of respondents with a PhD degree, and leaving behind those with bachelor and master degree as the last.




Graph 5. Anxiety trait by respondents' educational level




Graph 6. Anxiety State by respondents' educational level

8. Having in consideration the number of cases per city, we do believed that there are significant differences among participants that live in cities with greater number of cases infected by coronavirus , in comparison to those that live in cities with no such history.

*Descriptives*

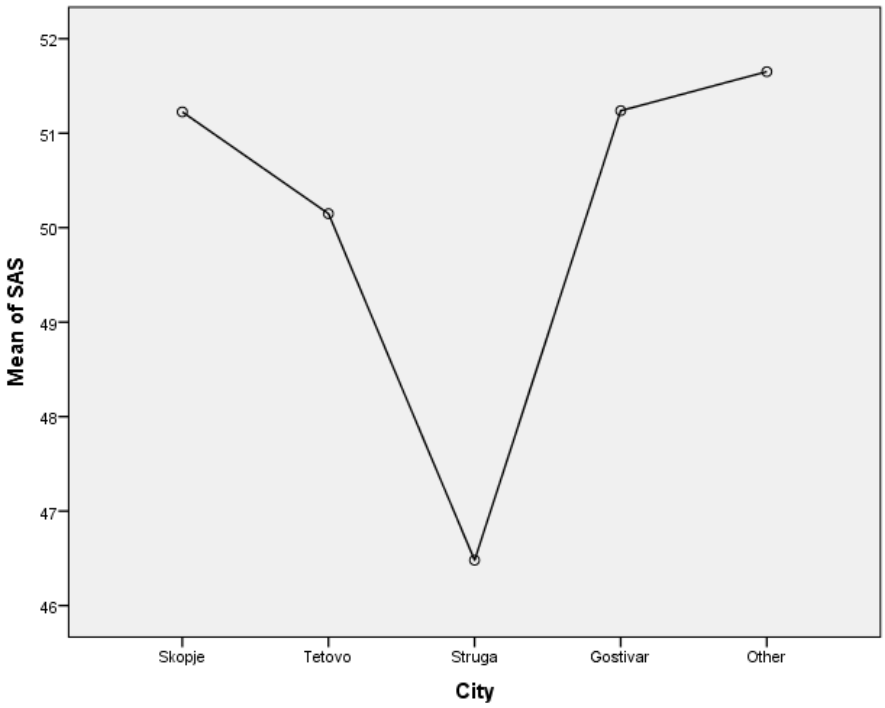
| | | | | | | 95% Confidence Interval for Mean | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | N | Mean | Std. Dev | Std. Error | Lower Bound | Upper Bound | Min | Max |
| SAS | Sko | 111 | 51.23 | 10.2 | .972 | 49.30 | 53.15 | 33 | 76 |
| | Tet | 81 | 50.15 | 9.47 | 1.052 | 48.05 | 52.24 | 30 | 73 |
| | Str | 25 | 46.48 | 8.10 | 1.621 | 43.13 | 49.83 | 32 | 67 |
| | Gos | 21 | 51.24 | 10.6 | 2.317 | 46.41 | 56.07 | 31 | 73 |
| | Other | 43 | 51.65 | 11.4 | 1.750 | 48.12 | 55.18 | 32 | 85 |
| | Total | 281 | 50.56 | 10.1 | .603 | 49.37 | 51.75 | 30 | 85 |
| SAT | Sko | 111 | 57.38 | 13.3 | 1.264 | 54.87 | 59.88 | 30 | 89 |
| | Tet | 81 | 60.65 | 13.5 | 1.501 | 57.67 | 63.64 | 30 | 89 |
| | Str | 25 | 56.76 | 12.8 | 2.567 | 51.46 | 62.06 | 32 | 73 |
| | Gos | 21 | 61.43 | 16.8 | 3.677 | 53.76 | 69.10 | 31 | 89 |
| | Other | 43 | 59.16 | 12.9 | 1.970 | 55.19 | 63.14 | 32 | 88 |
| | Total | 281 | 58.84 | 13.5 | .809 | 57.25 | 60.44 | 30 | 89 |

*ANOVA*

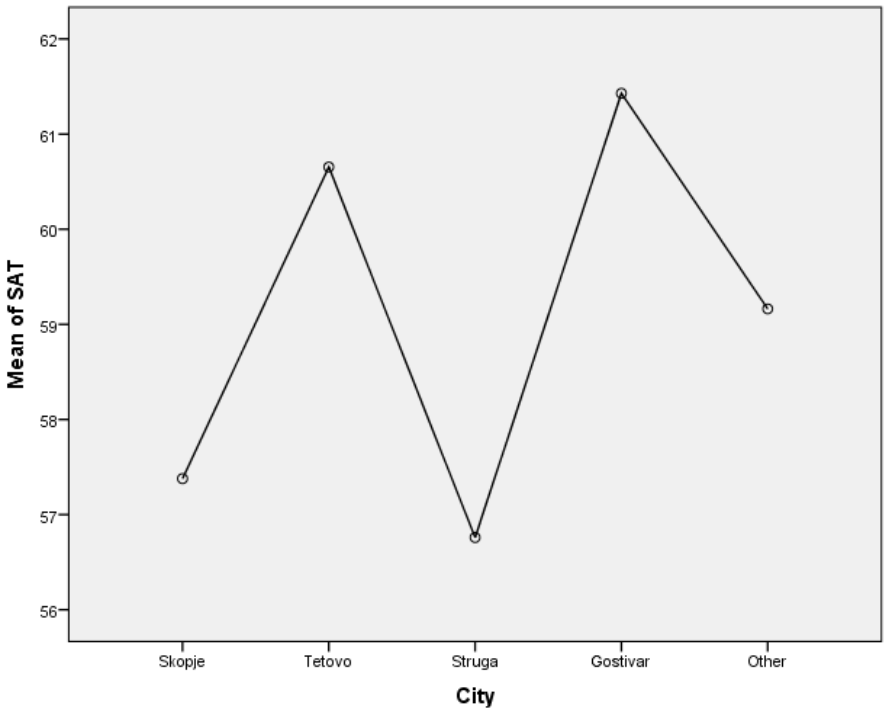
| | | *Sum of Squares* | *Df* | *Mean Square* | *F* | *Sig.* |
|---|---|---|---|---|---|---|
| *SAS* | *Between Groups* | *539.873* | *4* | *134.968* | *1.327* | *.260* |
| | *Within Groups* | *28063.409* | *276* | *101.679* | | |
| | *Total* | *28603.281* | *280* | | | |
| *SAT* | *Between Groups* | *757.118* | *4* | *189.279* | *1.030* | *.392* |
| | *Within Groups* | *50735.992* | *276* | *183.826* | | |
| | *Total* | *51493.110* | *280* | | | |

Table 8. State-Trait Anxiety analyses of the respondents regarding their hometowns

Referring to the tables above, which compare the means of respondents responds coming from different cities across North Macedonia and the variables we conclude that the means are not statistically different, since the results F=0.26 and F=0.39 are greater than the significance level p=0.05, therefore we state that we can't reject the null hypothesis.




Graph7. Respondents' hometown and state anxiety data




Graph 8. Respondents' hometown and trait anxiety data

By looking at the graphs we can see that the respondents coming from Struga are those with lower levels of anxiety in both categories. We notice high levels of anxiety in the participants coming from Gostivar, in both categories, and leading in the state anxiety. Tetovo also shows moderately the presence of anxiety levels in both categories, leaving Skopje respondents and from other cities, in between.

## Conclusion and Future Recommendations

Referring to our data analyses we were able to come to the conclusion that there is a significant strong positive correlation among people that experience state anxiety and those who suffer from trait anxiety, meaning that those individuals that suffer from one type of anxiety, do also experience the other one as well.

Our findings suggest that the majority of the respondents do not feel anxious about the thread of the novel coronavirus, followed by those who moderately find the thread dangerous for their wellbeing (see Graph 1.). On the other hand, when data were analyzed for trait anxiety, the majority of our respondents resulted to experience a moderate level of anxiety. Comparing these two types of anxiety and their presence in our population by percentage, we can conclude that in our population, trait anxiety is more visible or present as a personality trait, than state anxiety as a state, due to the pandemic outbreak.

Through this research we couldn't find any gender differences when regarding the state anxiety due to pandemic outbreak, but we could prove that females exceed males on their tendency to report fears, worries and anxiety across many situations (trait anxiety).

We didn't find any statistical difference among the means of our respondents when we compared the ST-Anxiety and their age groups, meaning that there is no evidence that older people experience higher levels of anxiety in comparison to youngsters. (see table 4.)

Also we didn't find a statistical significant difference among the variables of anxiety and the marital status, therefore we conclude that marital status hasn't proved to be a crucial factor related to anxiety during the pandemic outbreak.

We were able to come to a conclusion that there is no difference when it comes to the tendency to experience and feel negative emotions, between employed and unemployed people, during coronavirus outbreak, since the employed are frustrated having to contact with many people during the day and on the other hand the unemployed struggle with their survival.

Respondents educational level regarding the variables of our study, haven't shown a significant statistical difference, meaning that education level is not a factor that influences how one's cope with anxiety on pandemic times.

And the last finding of this study is that respondents' hometowns don't play a role on the state or trait anxiety levels, no matter if their city counts the highest or the lowest number of coronavirus infected people in the country. Respondents from city of Struga show lowest levels of anxiety in both types, and the majority of the highest levels of anxiety, in city of Gostivar (see graph 7 & 8).

**Recommendations for Future Researchers**

In our survey we have emphasized the desire to understand two aspects of anxiety in the pandemic times, involving adults only in the research process. We are aware that doing this we missed data findings involving teenagers and old adults, therefore we recommend that future researchers in the same topic, would want to analyze anxiety in other stages of life. Having the data compared between early adulthood participants and middle age adults, we think that we might have had different results of anxiety range if we planned elderly people to be participants of this survey.

Including an alternative a.c.a intervening variable would have been preferred in order to distinguish female and male participant's anxiety sources or their connection. For instance if the pandemic outbreak is the independent variable, and anxiety as a state vs trait are the dependent variables, that the intervening variable might have been: family (financial) incomes; access to quality healthcare; nutrition; sleep habits etc., that could have linked pandemic outbreak with anxiety.We do believe that even

though we didn't find any relevant gender differences between them, if we had an intervening variable we would have been able to achieve that difference.

For data gathering we have used the software Survey Planet in order to design and share our survey online, because sharing it on paper during the pandemic with the restriction measures was quite difficult, but the disadvantage of this way of gathering data is that we can't really tell how likely the participant is engaged in answering the items; do older people know how to respond to online surveys ; lack of the interviewer to clarify the items can lead to less reliable data, therefore doing a combination of two survey modes: paper and online questionnaires would give us a whole new perspective of the current issue.

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# A Study Case for Relationship between Skeletal Anomalies and Posture

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## Abstract

The concept that good health is connected in some way with posture is not new to the medical contemporary philosophy, because several authors have demonstrated an association between the morphology of the cervical column, the head and neck posture and mandible position. Different authors have highlighted a correlation between the morphology of the cervical column and the face dimensions. Positive correlations are found between cervico-cefalic posture and the anterior level of the dent-alveolar mandible and maxilla. For our study the main objective was to discover the relationship between oral anomalies and posture, analyzing the cervical and spinal pathologies at patients with malocclusion. In this study were involved 200 patients aged 5-16 years old with clinical anomalies, presented for 2006 - 2011 period in Orthodontic Department of Medical Dentistry Hospital. Patients were divided in four groups based on their oral anomalies. We performed clinical and radiological examinations, evaluating the morphology of the cervical column. Cephalometric measurements were performed in order to evaluate the cranial basis angle, the vertical craniofacial dimensions, and the sagittal relation of the jaws with each other and with the anterior and posterior cranial bases. Panoramic x-rays were also taken for each individual included at the study. Our study has demonstrated that patients had a higher prevalence of postural pathologies (32%) compared to the control group (3%), and in this change was find a significant statistically value about $p<0,001$. Also, the most prevalent postural anomalies were fusion C2-C3, kyphosis and lodrosis and less scoliosis.

**Keywords:** Skeletal Anomalies, Posture Morphology, Craniofacial Dimensions, Kyphosis, Scoliosis

## Introduction

Malocclusion is a pathology that affects the teeth – jawbone – face apparatus. A causal relation may exist between craniofacial and occlusion morphology, especially the posterior, anterior and lateral positions of the mandible and abnormal posture of the body (1). The concept that good health is connected in some way with posture is not new to the medical contemporary philosophy. Dental health, too, may have an impact in general health. Recent research suggests that oral anomalies may influence the posture in certain individuals. Several authors have demonstrated an association between the morphology of the cervical column, the head and neck posture and mandible position (1-5). Solow et al. have highlighted that there is a correlation between the morphology of the cervical column and the face dimensions (3). Positive correlations are found between cervico-cefalic posture and the anterior level of the dento-alveolar mandible and maxilla, as well as of the tendencies of the upper and lower oclussal planes (6, 7). The mandible position may change continuously depending on head and neck position (7-9). The patients with different dental anomalies and especially at the skeletal level, for example skeletal dental anomaly of the II$^{nd}$, III$^{rd}$ class, the deep bite and the unilateral or bilateral cross bite, show different postural problems, such as the fusion of the C2-C3 vertebras, scoliosis, lordosis and kyphosis, etc. The time when symptoms appear depends on several factors, including the posture duration and individual adaption ability (10, 11). The aim of our study was to discover the relationship between oral anomalies and posture, by analyzing the cervical and spinal pathologies in patients with specific malocclusions in comparison with individuals with normal occlusion and craniofacial morphology (control group).

## Material and methods

This was prospective study which included 200 patients aged 5-16 years old with clinical anomalies at the teeth – jawbone – face apparatus, who presented at the Orthodontics Unit at the University Hospital Center, in Tirana, Albania for 2006 to 2011 period. 200 age- and sex-matched individuals with normal occlusion and craniofacial morphology were included as a control group. Patients were included if they fulfilled the following criteria: had not received any orthodontic treatment during childhood; having at least 24 permanent teeth; and with no congenital craniofacial anomalies. Controls were included if they fulfilled the following criteria: having almost normal occlusion with no need for orthodontic treatment; having normal sagittal or vertical relation of the jaws, evaluated by lateral radiography for each individual. Patients were divided in four groups based on their oral anomalies:

**First group:** included 50 patients with II$^{nd}$-skeletal class; 16 of them had cervical problems, of whom 10 patients had C2-C3 fusion, and 6 patients had deficiencies of the C1 posterior arch.

**Second group:** included 50 patients with deep bite: 23 patients had fusion problems at C2-C3.

**Third group:** included 50 patients with III$^{rd}$ skeletal class: 11 of them had posture problems, 2 others patients had scoliosis and 9 patients kyphosis.**Fourth group:** included 50 patients with unilateral cross bite, 14 of them had scoliosis.

We performed clinical and radiological examinations, evaluating the morphology of the cervical column. Cephalometric measurements were performed in order to evaluate the cranial basis angle, the vertical craniofacial dimensions, and the sagittal relation of the jaws with each other and with the anterior and posterior cranial bases. Panoramic x-rays were also taken for each individual included at the study.

### *Statistical analysis*

The data were analyzed with SPSS 20.0 package. The categorical variables are shown in tables with absolute/relative frequencies. The distribution test of the continual variables was done with Anderson – Darling method. The $X^2$ test with Yates correction was used for the comparison of proportions between variables. Significance level was set at $p<0.05$.

## Results

The average age of the patients was 11.9 years with standard deviation SD±3.4 years (range 5-16 year), while the average age of the control group was 10.4 years with SD±3.4 years (range 5-16 years). There are not statistically significant changes between patients and control group with regard to age (p=0.7). 142 patients (71.5%) and 142 individuals of the control group were females, while 58 (28.7%) patients and 58 individuals of the control group were males. The demographic characteristics of the patients and control groups are given in table 1.

**Table 1.** Demographic characteristics of the patients and control group

| *Group* | *n (%)* |
|---|---|
| *Females n (%)* | *142 (71,3)* |
| | *142 (71.3)* |
| *Males n (%)* | *58 (28,7)* |
| | *58 (28.7)* |
| *Age in years mean (SD)* | *11,9 (3,4)* |
| | *10,4 (3,4)* |
| *Age in each group mean (SD)* | |
| *IInd skeletal class (n=50)* | *11, 5 (3,2)* |
| | *11,7 (2,8)* |
| *Deep bite (n=50)* | *11,0 (2,9)* |
| | *11, 7 (2,8)* |

| | | |
|---|---|---|
| *IIIrd skeletal class (n=50)* | *11,3 (3,1)* | *10, 9 (2,9)* |
| *Cross bite (n=50)* | *10,5 (2,7* | *11,1 (2,6)* |

In total the postural and cervical pathologies were manifested in 64 (32%) of patients, compared to 6 (3%) individuals of the control group ($p < 0.001$). The postural anomalies for each group of patients are shown in table 2.**Table 2.** The prevalence of cervical–spinal in patients with different types of mal-occlusion

| *Group* | *n (%)* |
|---|---|
| *First group: II$^{nd}$ skeletal class* | |
| *Normal* | *34 (68%)* |
| *With postural anomalies* | *16 (32%)* |
| *Fusion* | *10 (20%)* |
| *Lordosis* | *6 (12%)* |
| *Second group: deep bite* | |
| *Normal* | *27 (54%)* |
| *With postural anomalies* | *23 (46%)* |
| *Third group: III$^{rd}$ skeletal class* | *39 (78%)* |
| *Normal* | *11 (22%)* |
| *With postural anomalies* | *9 (18)* |
| *Kyphosis* | *2 (4%)* |
| *Scoliosis* | *36 (72%)* |
| *Fourth group: Cross bite* | *14 (28%)* |
| *Normal* | |
| *With postural anomalies* | |

## Discussions

In our study we included 200 patients and 200 age- and sex-matched controls. Selection of this age group was based on an orthodontic rationale, since patients with skeletal anomalies are still growing at this age, and thereby they will respond well to orthodontic therapy. One of the postural pathologies observed in our study was idiopathic scoliosis (8%). According to different authors, this postural pathology was shown in children between 10 years old and skeletal maturation age and includes almost 80% of all idiopathic scoliosis cases (12, 13). It affects girls more than boys (14), and the prevalence is estimated to be between 2-4% of children 10 -16 years old. This female preponderance may be due to hormonal changes, which appear earlier in females (15-17). Many authors suggest that there is a significant association between the II$^{nd}$, III$^{rd}$ class of mal-occlusion and body posture (18-20). Oclussal anomalies may account as risk factors in as much as 30% of patients with postural problems. In accordance with these authors, our study demonstrated that patients had a higher prevalence of postural pathologies (32%) compared to the control group

(3%), and this change was statistically significant (p<0,001). Children with II$^{nd}$ class skeletal malocclusion have shown an important extension of the cervical lordosis compared to patients with I$^{st}$ skeletal class and keep the head well in front (6,22). The prevalence of lordosis in our study was 37%. The research of Ben-Bassat et al has shown that patients with scoliosis have more asymmetry at the sagittal and transversal dimensions, compared to normal individuals (23). Patients with scoliosis have a greater prevalence of the deviation of the lower median line (posterior cross bite). More studies from other authors shown the correlation that exists between cervical-cephalic posture and craniofacial morphology (4,24). Positive correlation was demonstrated between cervico-cefalik posture and the anterior dento-alveolar dimension of the mandible and maxilla, as well as the inclination of the inferior and superior occlusal plan (3,4).

## Conclusions

The results of our study show that patients had a higher prevalence of postural pathologies compared to the control group, and this change was statistically significant. The most prevalent postural anomalies were fusion of C2 – C3, kyphosis and lordosis and less scoliosis.

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# Prevalence of Oral Habits in Dentalanomalies

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## Abstract

There are a lot of oral habits in which are included even non-nutritional habits. The role of these habits has been evidenced in the development of different malocclusion in each plane, vertical, transversal and sagittal ones. The reason why habits can cause such problems is based on equilibrium theory. The main purpose of this study is to assess the prevalence of non-nutritional habits and their effect development of dental anomalies. The method of this study was descriptive in prospectively. Its duration was 20 months. The age of children taken in this study vary from 6 to 15 years old and was selected casually at clinics of "University of Mother of Good Council" and two private clinics. Results we were able to fill the questionnaires of 194 patients in which 50.3% of them were females and 43.1% of them were males. According to the age of children, there was a frequency of 46.7% of 6-10 years old children and 53.3% of 11-15 years old ones. Results on the frequency of non-nutritive habits were about 64% of fake pacifier usage, in which there was a variety of percentage of time when it was used. Meanwhile, thumb sucking resulted in 10.20 % of results, lip biting or sucking 7.10%. Conclusions: This group age was very often in predisposition to have such habits. Our results confirm the impact of these habits in the development of different malocclusions. We recommend applying preventive strategies so we can avoid the installation of these habits and such malocclusions.

**Keywords:** malocclusion, oral habits, developing, preventive, dental anomalies.

## 1. Introduction

There are a lot of oral habits, where in this article we will focus at non-nutritive oral habits. The habit is as the visible part of an iceberg, while the consequence, the major part, is under water. The consequences of this habit consist of the manifestation of malocclusion. Malocclusion is defined as abnormal positions of teeth or a non correct proportion of jaws. (1) These malocclusions can be classified according to the

transversal, sagittal and facilitated vertical plan as: Transversal (median line mismatch, scissors bite, cross bite posterior, edge to edge bite); Sagital (protrusion, retrusion, II molar class and III molar class); Vertical (open bite, deep bite , edge to edge bite, teeth supra and infra occlusion). The manifestation of this malocclusion from the implication of oral habit is explained by the equilibrium theory. This theory elucidates that if equal force is exerted on an object then it will stay in the same position, thus the forces are in equilibrium .The opposite will happen if unequal forces are exerted on an object, it will move in the direction of the greatest force exerted.(2). In oral cavity there is a harmonic balance between the pressure of cheeks, tongue and lips which will lead to a normal dento-facial and skeletal growth. In that moment when a habit interferes, this balance will disrupt and we will have an abnormal pressure of soft tissue, alternation of the muscles. This will lead to altered dento-facial and skeletal growth. (3) The purpose of this study was to evaluate the prevalence of non nutritional suctioning habits and their impact in the development of dental abnormalities. Objectives consisted of estimating the number of cases with non nutritional suctioning habits, orthodontic evaluation of malocclusions caused by the habits, estimating the distribution of these habits by sex and age, and evaluating possible linkages of casual factors and development of oral abnormalities.

## 2. Methodology

This study was a descriptive prospective one that lasted for a period of 20 months (November 2017- June 2019). Children of the age group of 6–15 years were randomly presented in dental clinics. In total, data on 194 individuals were collected. The inclusion criteria of these individuals consisted of: The presence of deciduous canine and first molar; the presence of permanent canine and first molar; all previous orthodontic treatment services and / or more; no cranio-facial abnormalities (different cleft or syndromes). These data were collected in clinics like the stated one in the Faculty of Dental Medicine, in the University of “University of Mother of Good Council” and in two private dental offices by writing down a standard form (4) This form was divided into a consensus section and three sections (general information, anamnesis and clinical extraoral and intraoral examination) to be completed by the physician. Time for the examination was approximately 20 minutes and we did take care for the control of infection. To minimize mistakes was chosen specialist physician with knowledge in this field.

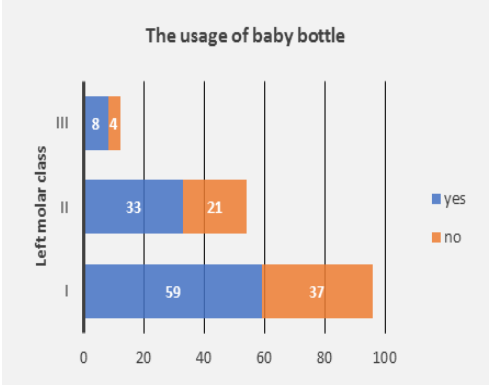
## 2.1. Statistical analyses

Data were processed in statistical software such as SPSS 19.00 and Excel 13.00. The links that were reached were considered significant if the p-value≤ 0.05 and proved by testHi-square.The results were presented in tables and simple graphics and were also compared with articles with the same focus, found in PubMed and Cochrane.

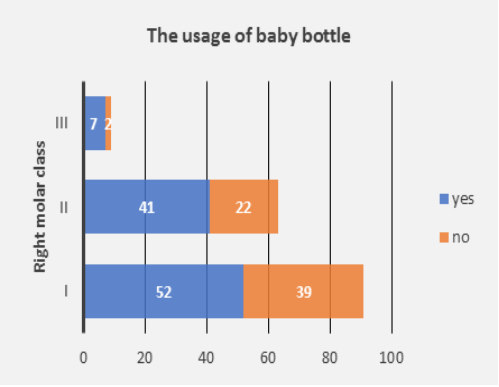
## 3. Results

In this study we found that we had 43.10% males and 50.3 % females while the frequencies of the age group were distributed in 46.7% for 6-10 years old and 53.3% for 11-15 year old. Based on the results 64% had used pacifier respectively 16.8% only during sleep, 21.8% only when they cried and 23.8% every moment. It was found a relation between using pacifier and the molar class in both right and left side with p-value 0.03 and 0.04. (Graphic.1,2).

Graphic.1:



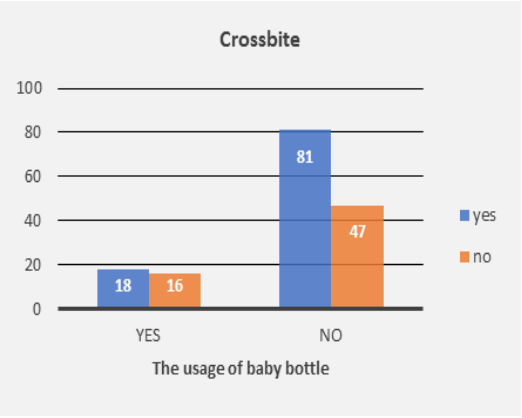

Graphic.2:



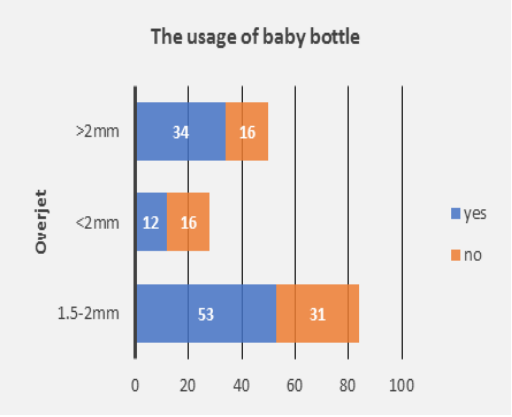

The other malocclusions that can relate with the pacifier as a cause of their presence are over-jet (graphic. 4), cross-bite(graphic .3) and dental crowding (graphic .5).We can say that it came to a very significant connection especially with the cross bite

where p-value resulted 0.000. (graphic.3) there was also a strong connection between this type of malocclusion and pacifier usage.

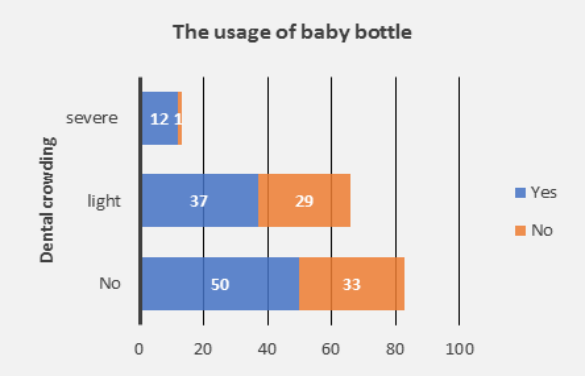
Graphic.3




Graphic.4




Graphic.5



Other habits like thumb suctioning or the suctioning / biting of the lips resulted in frequencies correspondingly 10.20% and 7.10%. Most predisposed to these addictions were children of the age group 11-15 years old, while there were no statistically significant differences regarding gender. These other non nutritional suctioning habits resulted to have significant statistically relation with right and left molar class, canine class and open bite.

## 4. Discussion

In our study as we emphasized before non nutritional suctioning habit resulted in frequencies 58%. Other authors referred frequencies from 25.5 % (5) up to 88% (6). This sensitive difference can happen for many reasons. First, in our study these habits are considered present only if the clinical examinations and the information that parents referred were in correlation, which is not specified in other studies whether it has been evaluated in this way or not. Second it varies because of the desire of parents to participate in these relevant studies. It is important to emphasize the difference between the results of our study and the results of Quashie-Williams, which is as the result of the different age group considered, respectively 6-15 years old and 11-13 years old. Also our result on the absence of any significant difference between habit and gender was supported by other authors. (7) While age-related results varied slightly differently in Shetty & Munshi's studies referring to higher frequencies in the 12-year-old age group, which would decrease with increasing age.(8)The relation between these habit and molar class and canine class were supported also from other authors like Lux et al, (9) and P. Cozza (10) who had done similar studies respectively in Germany in the age group of 9 years and in Albania in the age group of 7-15 years. Another anomaly with which a statistically significant association was obtained for non nutritional suctioning habit was open bite as we mentioned before 9.94% of individuals had at least one non nutritional suctioning habit and open bite, a result different from that of Martin et al. which reported prevalence of 38.5%. (11) This difference may be due to the disregard of the duration of the disruption in different children and the self-corrections that may have occurred from early disruption of the habit. Cross bite is one of the most frequently analyzed malocclusions due to the use of pacifier. This fact was also confirmed by us, which resulted in a frequency 11.11% of babies using pacifiers to have cross bites with a very strong significative relation (p-value=0.000) confirmed by many other authors where among them Heimer et al referenced a prevalence of 10.04%.(12) However, there were other confirmations by other authors of higher prevalence such as Gomes & Silva et al. with a prevalence 29.05%.(13) This difference may be due to the variation in timing of the use of pacifier or the combination of its use and the breast feeding in different individuals.

## Conclusion

Based on the goals we set, in the entirety of the prevalence, in this investigation the prevalence of non nutritional suctioning habit resulted in high percentage almost

58% and more expressed in 11-15age group. Knowing the etiology of malocclusion is essential to the success of an orthodontic treatment because the prerequisite for correction is to eliminate the cause. From this investigation we concluded and reinforced the opinions of various authors on the association of non-nutritious suctioning habit with dental abnormalities as follows: The connection between these habits and second molar (38.9%) and canine (38.9%) class was evident; individuals that have at least one of these non nutritional suctioning habit have the possibility to have the reduction of vertical height, thus predisposition for open bite; in our study 11.11% of children who had used the pacifier had open bite; the link between pacifier use and dental crowding was evident where 37 and 12 children (out of 162) had light and heavy crowding, respectively.

## Recommendations

These data can provide the basis for planning preventive strategies to eradicate oral habits and reduce the chance of malocclusions,furthermore contributing to an increase in the national level of oral health.Dentists, along with other health professionals, should educate parents.The latter should make sure that there is no need to worry if their child has an addiction to school age,time to try to encourage the child to stop the habit in order to reduce the potential harmful effects on the occlusion. However, we believe that these kinds of problems require close cooperation between the various specialists (pediatrician, allergist, orthodontist and speech therapist) and early orthodontic visit and treatment, when needed in children with bad habits, allergic rhinitis and / or adeno-tonsillar hypertrophy. This will allow for early detection and timely treatment of dysfunctions to avoid the deterioration of already occurring malocclusions. The method to reduce the number of individuals with habits may include the use of provisional devices that reduce the active child's habits and subsequently the use of devices to correct malocclusions.

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# Use of Steroids by SUT Students

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## Abstract

Through the survey carried out with SUT students we seek to assess how much they know about steroids, their use, benefits and side effects. These students are active: as athletes in various disciplines, in coaching and after graduation as teachers of physical education and health. 201 SUT students, 113 males and 88 females were randomly included in the survey. This topic was selected because these substances can be easily found and used without prescription of a specialist in Albania. Raising the awareness of SUT students is important for their health and as future educators serve as a promoter of healthy living to every child at school or peoples engaged in sports.

**Keywords:** steroids, students, SUT

## Introduction

Anabolic androgenic steroids AAS are synthetic derivatives of testosterone, which is the primary male sex hormone. Anabolic androgenic steroids are used to enhance athletic performance and appearance. Adverse effects include those on the liver, serum lipids, psyche/behaviour and reproductive system.

Through the survey of the target group, students of SUT, we seek to assess how much information they have about steroids, their use, benefits and side effects. Students are athletes of various disciplines, are engaged in physical activity as part of a job, stay active for personal pleasure and the rest engage in physical activity only during the school practice classes. After graduation they are employed as teachers of physical education and health, as personal trainers and as coaches in various sports disciplines serving as a link between physical activity and health of any age.

Public health problems are also increasing in our country, given the IPH's National Health Report 2014. Meanwhile, according to studies carried out it has been confirmed that physical activity and exercise improves quality of life, prevents and is used to treat many diseases but mainly in the field of mortality reduction, CVD

risk factors and micro vascular complications, etc. For all these reasons, there is an increasing interest in our country to include the population in physical activity, therefore our mission is to prepare professionals with knowledge and information on how to select accordingly physical exercise, its duration by taking into consideration certain health conditions, nutrition and supplements, etc, and thus ensuring satisfactory quality and results for each individual.

## Material and methods

In the survey there were included 201 SUT students from all years of study, aged 19-26, who were randomly selected and the respondents are 113 or 56.2 males and 88 or 43.8% females.

This topic was selected because: according to our knowledge there is no national study on the use of steroids for the Albanian population, we addressed a contingent with a young age and that engage in physical activity as these two factors have a considerable affect in the use of steroids. Moreover, in the school curriculum these substances are dealt with only in a few lectures in the third year of bachelor studies. Another reason is that these substances in our country can be easily found in the black market or authorized stores and are used without the recommendation of a specialist doctor as the latter is nonexistent.

The questionnaire used was structured and drafted in collaboration with psychologists and with the aim to be applied to students who deal with public health (e.g. nurses) and our intention is to understand whether we should intervene in the curricula or if the information they actually receive is sufficient.

The survey was distributed, filled and collected via Google forms.

## Results and discussions

We need to clarify that the period when the questionnaire was distributed was during the pandemic, thus students have less opportunity to perform physical activity or to be briefed before answering the questionnaire as this survey was online.

According to the responses given we have obtained the following important results:

According to the place of residence 183 (91.04%) live in cites and 18 (8.96%) live in villages, so they have the opportunity to engage in physical activities.

This is confirmed in the next question where 177 (88.1%) engage in physical activity while 24 (11.9 %) don't. Those who engage in physical activity at a frequency of 0-2 times a week do exercise / physical activity 55 (27.4%) of them and 66 (32.8%) do fitness, so they are not athletes but amateurs and the rest 80 respondents (39.8%) are engaged in various disciplines.

Q: Do you know the substances called “steroids”? A: Yes = 183(91.0%), No = 18(9.0%)

Q: If yes, where did you get the information from?

A: Internet = 140 (69.9%.): TV = 35: Friends = 73: Literature = 45: Medical staff = 26:(12.9%.)

Based on the answers received we assume that the students may have received and looked up for information on steroids at the time of completing the questionnaire. This raises the need for curriculum review not only at the University but perhaps even in the earlier stages.

Q: Do you think anabolic steroids increase muscle mass?

A: Yes = 170 (84.6%), No = 31 (15.4%),

This is a topic of conversation between people who engage in physical activity, strengthening the fact that (36.3%) have received information from friends and colleagues.

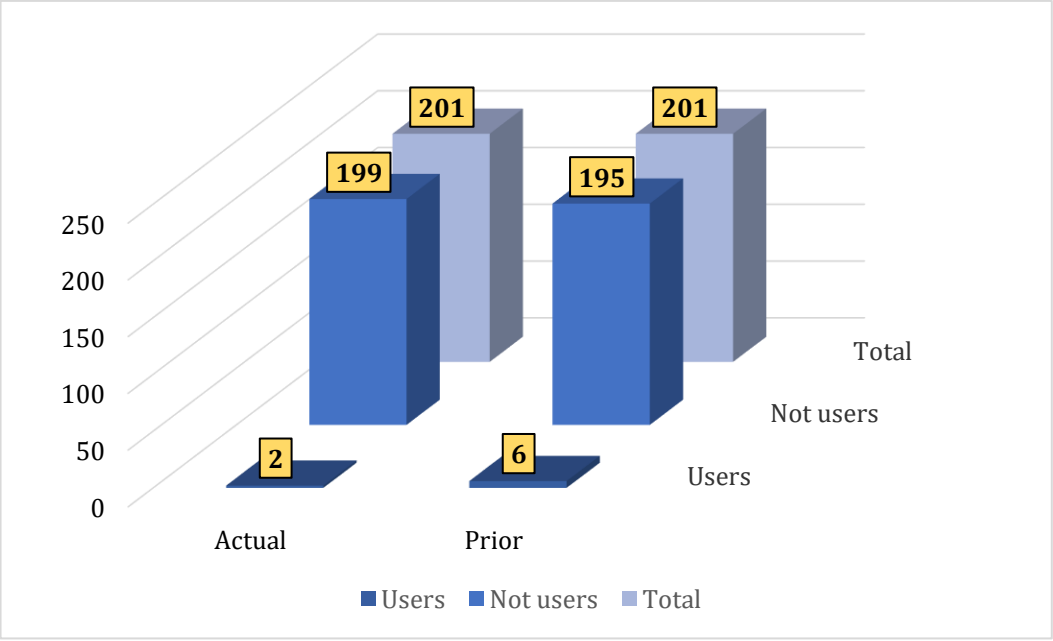


Diagram 1: Previous and Actual users of AAS

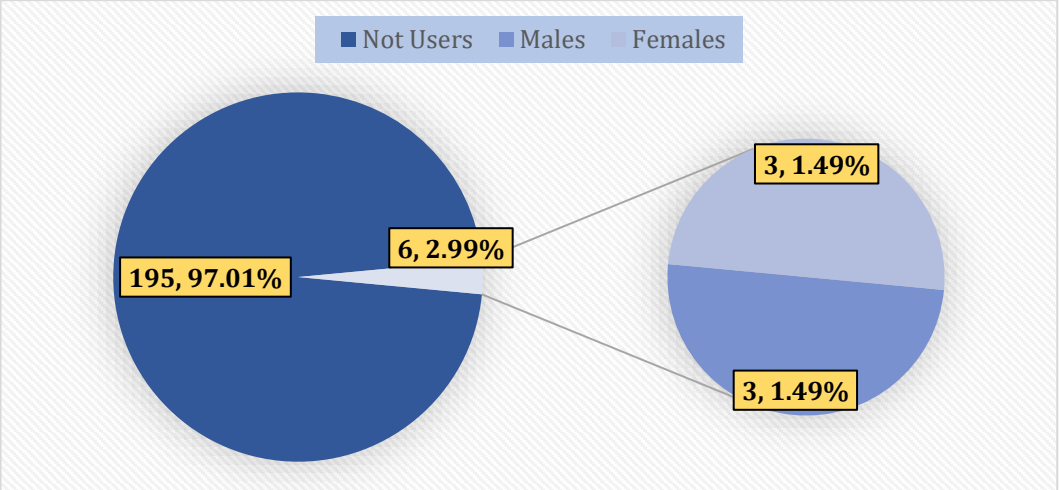


Diagram 2: AAS Users divided between males and females

Diagrams1,2 show that the users of AAS are actually only 2(1.0%) but 4 other respondents have consumed them sometimes in their lives but fortunately are at a low percentage respectively at 2.99%. However, it needs to be highlighted that both genders have consumed them equally. Another fact worth highlighting is that these 6 subjects are engaged in a sports discipline.

Q: When did you first use AAS?

6 answers are given by respondents aged between 15-20 years which correspond to other studies which state that this is the age group with a higher tendency to use these substances.

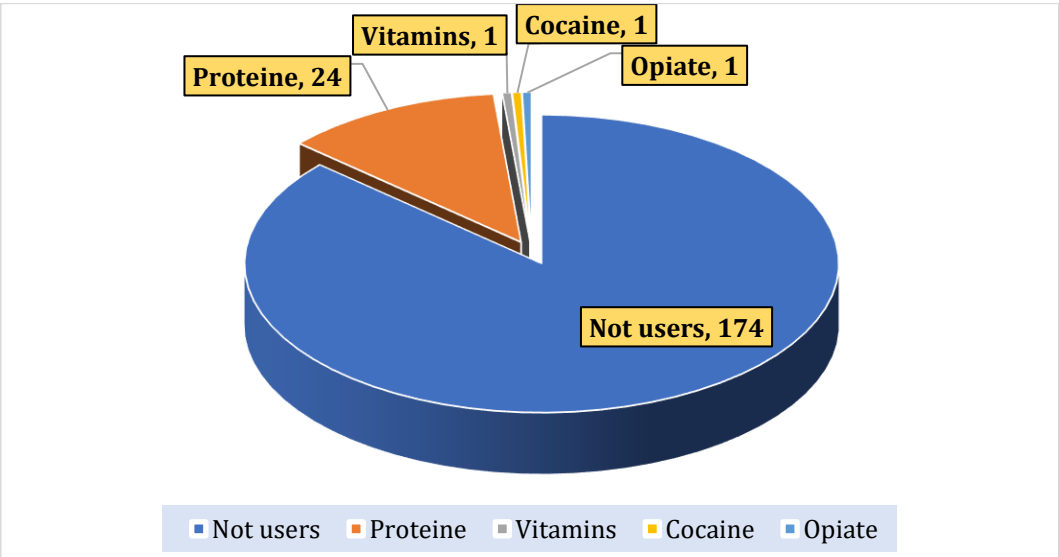

Diagram 3 Users of others substances

As shown in above diagram the question: Do you use substances other than anabolic? Is answered accordingly: Yes = 27(23 = Protein as supplement: 1 = anabolic hormone + Protein as supplements: 1 = Vitamins: 1 = Cocaine: 1 = Opiate)

No = 174 (86.6%),

The answers to this question emphasize once again that our students tend to use supplements, mostly healthy, but still it is worrying the fact that these are taken without a doctor's recommendation. 12% of them use supplements in the form of supplements, of which 50% go to the gym, so they tend to increase their use when exercising at the gym, as well as the ones who engage in football and boxing.

Q: Do you know anyone who uses AAS? A: Yes = 66 (32.8%), No =135 (67.2%),

Q: What is the main way in which you / your acquaintances obtain these substances?

A: Shopping in authorized stores = 104 (60.5%), at illegal market = 68 (39.5%), No answer = 29

Q: How are these substances taken?

Orally=70: Injection = 106: No answer = 25

Q: Do you know the side effects of AAS on physical health?

A: Yes = 20 (9.9%), No = 65 (32.4%), No answer = 116 (57.7%),

57.7% have not answered indicating that they do not know the side effects as they do not even know these substances.

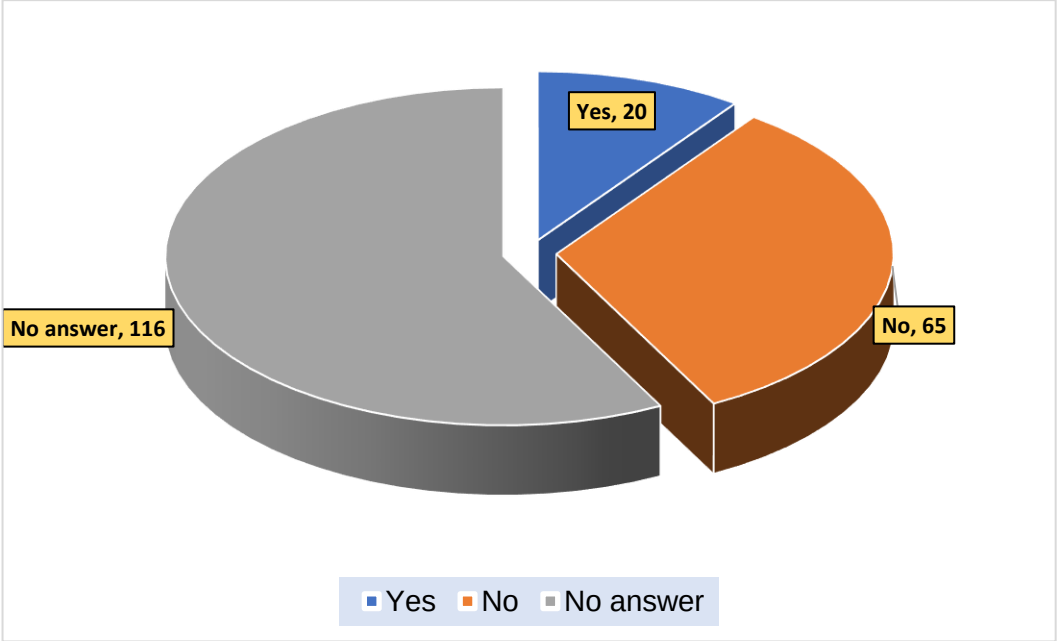


Diagram 4: Information about side effects on physical health

This fact is clarified by the answers to the following two questions:

• What is the reason that these substances are used, according to you?

A:

To improve physical appearance = 86

To improve physical performance = 105

No answer = 10

Q: Do you think anabolic affect in the following? (choose one or several alternatives according to your information)

A:

Body weight = 80

Muscle size = 138

Muscle strength = 81

Increases fertility = 24

Increases breast = 39

Affect the heart = 98

Cause acne = 32

Cause behaviour change = 45

Cause mood swings = 48

Cause different types of cancer = 48

**Results**

The results of questionnaire are as follows:

- 177 engage in physical activity, 24 don't.
- Q: Do you know the substances called "steroids"? A: Yes = 183, No = 18
- Q: Do you use these substances? A: Yes = 2, No = 199
- Q: Do you use substances other than anabolic? A: Yes = 13, No = 188
- Q: Do you know anyone who uses AAS? A: Yes = 66, No =135
- Q: How are these substances taken?
  - A: Orally=70: Injection = 106: No answer = 25
- Q: What is the reason that these substances are used, according to you?

A:

To improve physical appearance = 86

To improve physical performance = 105

No answer = 10

**Conclusion**

Students have information but not thorough knowledge on what steroids are, what they cause in the body; they know very little about the positive effects and almost all the negative ones, so we suggest that the curriculum should be reviewed not only at University level but maybe even earlier.

The student subjects who practice a certain discipline are 39.8%, so on the light of this fact the users of steroids are in small percentage only 2.99%.

Our students tend to use supplements, mostly healthy, but again worrying is the fact that they are taken without a doctor's recommendation.

As we suspected in our country steroid substances are also found on the black market as 39.5% of the respondents have confirmed it.

This study exceeded our expectations by raising the claim that perhaps the time has come to undertake a national study on the use of steroids for people who engage in physical activity, adolescents or the Albanian population in general as abuse of these substances is considered a matter of public health. At the same time, in order to prevent the use of AAS, we must insist on improving the knowledge and awareness among health care workers and employees engaged in physical activity, educational interventions, by updating respective legislation and using appropriate doping screening tests.

## Disclosure Statement

The author declared no potential conflicts of interest concerning the research, authorship, and/or publication of this article

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# Importance of Health Promotion and Education to Young People in Educational Institutions (Schools)

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## Abstract

It is important that in educational institutions to develop trainings and classes with a focus on health education and the acquisition of necessary knowledge.This study aims to give a specific approach regarding the importance of health education promotion in educational institutions with a focus on educational and health-educational activities in particular based on health and which aims to increase the level of health education to learn and implement healthy behaviours.In this study were included 130 students in elementary and secondary schools aged 14-18,of whom (n=81) females and (n=49) males.The questionnaire was based on the knowledge of these students about health promotion and education as well as organizational activities related to health education by progressing in terms of the level of knowledge, attitudes and behaviours related to health.In the results of this survey was observed that a small number of them 21% had information on the promotion and development of various activities related to health. With a total of 56% women and 44% men responding that some form of activities or programs to promote public health such as posters or tasks related to certain topics have started to be developed by teachers.The lack of these activities and promotional programs requires that in the future to increase support in this direction enabling to plan in detail the development of educational and health promotional activities where the information is scientifically based and the way of communication and information is as clear and accurate as possible to have more acceptability,liking and the highest reliability.

**Key words:** Health education, promotion, young people, educational institutions

## 1. Introduction

Health promotion covers all aspects of activities and programs that aim to improve the health of individuals and the community (1).It includes any combination of educational and ecological support for actions and living conditions that improve and promote the health of everyone (2, 3). Health promotion is the process of training individuals to increase and improve their control over their health (Ottawa Charter)

(4). We can say with conviction that health promotion focuses on achieving equality in health for all individuals in the community. The promotion of health in schools represents a small and ideal world in which the beliefs, thoughts, knowledge, attitudes and habits will largely determine the evolution of the individual towards maturity, and will play a special role and contribution to its social life (5).In this respect, the cooperation between the world of health care and that of education and training represents a fundamental element for the development of activities that allow the management of processes which are overloaded by numerous pressures, especially commercial ones aimed at favouring the consumption of tobacco, alcohol, sugary drinks, high-calorie foods and drinks, through often contradictory media messages. Scientific evidence shows that a limited number of behaviours contribute to a large extent to determine some of the leading causes of death affecting our society, such as cancer and accidents.These behaviours, often developed at a young age, include the consumption of tobacco, psychotropic substances, alcohol, unhealthy diets, physical activity, and inappropriate sexual behaviours (6). Promoting health in schools is one of the basic elements of student education for which schools should invest today and in the future. Promoting health in school settings is important because health and education are closely linked.Healthy children are more likely to be more effective. Education plays an important role in the economic development and lifelong health outcomes.Promotion of health in all preschool and school cycles through the development of educational activities in general and educational-health in particular, both inside and outside the compulsory educational programs, in order to be continuous and systematic (7).The importance of health promotion in schools is great, as the school is the institution which covers a large part of the population, including young people. To achieve these objectives and common learning skills for all health education programs we must aim to analyse health content and improve the old methodologies that have characterized interventions so far. Quotes in school are often episodic, non-participatory and informative only. The core values of a health promotion school initiative which is also done through partnership can be to promote health through the topics, contents and methods analysed in order to highlight and overcome the fragmentation and operational disommogeneity that so far has not allowed a realistic assessment and reproducibility of the interventions performed (9). Nutrition, physical activity, sexuality, alcohol, psychotropic substances, smoking, other addictions, road accidents, mobility in home and stable conditions constitute the content of the following educational-health information which provides, for each field, the definition of the problem, identification of risk factors and protection factors. Presentation of national and international articles and guidelines, references to projects already completed on topics which include different geographical realities, learning objectives as well as teaching methods and tools for teaching in the field of health promotion and education serve as a key point for everyone's health as health is a value and fundamental right which we must preserve and take care of at all times.Given that health promotion is not only about changing behaviour but also about intervening in political, social and organizational factors, it is worth mentioning

the presence of numerous studies that highlight how health education conducted in schools is effective in reducing the prevalence of behaviours dangerous to the health of young people. In our context, health promotion can be presented as a combination of health education, and other activities that schools can undertake to maintain and improve the health of all those who are part of these institutions (8). We all care for chilldren, every child and young person has the right, and should have the opportunity, to be educated in school to promote health. The school represents, in fact, an essential meeting place for any serious and real health program which wishes to achieve a broad and positive impact on the health of the whole country as, more than any other institution, it can help you live in a healthier, more satisfying and productive way by helping to acquire knowledge and skills necessary to avoid risky behaviours.(10).School can also allow for the development of autonomy and empowerment processes by aiding learning skills such as knowing how to make decisions, communicate effectively, and resist external influences by making healthy behavioural choices.

## 2. Methodology

For the collection of this data was taken a volunteer sample to be part of this study from elementary and secondary school in Tirana.Of 150 questionnaires distributed 130 was valid so the final sample consisted of 130 subjects.Quantitative research was used where an anonymous questionnaire was completed based on the research method (observation) respectively through the survey method and the interview method.The questionnaire consists of 18 closed questions which in the first part deals with information about the use of alcohol and tobacco, in the second part the knowledge which is related to sexually transmitted infections, as important issues related to the health of young people and in the third part they were also asked about the development of promotional and informational activities in school, in relation to these important issues directly related to health.In completing this questionnaire participated 130 students aged 14-18 years, of whom (n = 81) females and (n = 49) males.

## 3. Results

Respectively in this study we found that 73.3% females and 26.66% males have shown that they have general knowledge about sexually transmitted infections but not in detail, this information that remains evasive and unclear, where it is worth noting that today this information about sex and sexually transmitted infections has never been so extensive and diverse. Therefore, it is very important that through activities or services for health promotion we must properly orient young people towards accurate and appropriate information. Also 65.5% of females and 34.5 % of males showed a low level of support for the organization of various health promotional activities whether from school, other organizations or local institutions.In terms of consumption of tabaco and alcohol as well as the damage and dependence that these substances cause for human body especially in young people

the answers have been that 75.2% males and 24.8% females admitted that the consumption of these substances was started simply as something different without actually realizing the real danger caused by their abuse. There has been a more positive approach, with a total of 56% females and 44% males responding to some form of activities or programs to promote public health such as posters or assignments related to certain topics by teachers, among which stated that recently, a number of activities have been developed as well as promotional programs for the necessary elaboration of human behaviors with a focus on educational health of various forms and dimensions. Most of the questions identified in relation to other health promotion activities have been answered of which show a low percentage 21% of development of these activities in general.

## 4. Discussion

As can be from the data reported in this study, knowledge and information exist in general but not in a detailed and specific way, and in this aspect the information must have a high level of acceptability, liking and reliability.The aim is not only to standardize accurate information about the health of young people, but also to raise awareness and enable them for a healthy life as they move through the stage of physiological and mental growth where there are not only the young people themselves who can pass the information on to each other but also the teachers.Therefore, in the future there should be increased activities and support in this regard. Promotional activities in schools are essential for students in raising awareness and caring for a healthier life. It is therefore expected that in the future there will be an increase in health promotional activities in schools, as health promotion interventions carried out so far in schools are often characterized by fragmentation and operational disommogeneity and their evaluation and reproducibility has not always been possible.The promotional programs themselves, the topics and contents of the respective interventions according to the age groups should gradually increase, advancing towards the level of knowledge, attitudes, habits and behaviours related to health.

## 5. Conclusion

These types of studies need to be extended more widely to the population with a large representation of children, pupils, students and parents, not only in urban areas but also in rural areas where it is known that many of these topics are still taboo, where these health promotion activities as well as the relevant topics should be conceived in function of the needs, problems and concrete priority situations. It is important for young people to learn from reliable and impartial sources of information, discuss with health care professionals, choose which option is right for them, so that the risk to their lives is minimal. Through which to be tested and to evaluate the perceptions and life practices related to health, evaluating the situations in a way to be served with the necessary interventions, appropriate and concrete improvements, for living everywhere more and more healthy and where the information is scientifically based

and the way of communication and information is as clear and accurate as possible to have more acceptability, liking and the highest reliability.

## 6. Recommendations

Therefore, these data can show that it is very important that through activities or services for health promotion we must properly orient young people towards accurate and relevant information. The school also welcomes all age groups during development for a long period of their lives and should provide them with the opportunity to observe and monitor the growth path and the model of health and well-being in which the individual is focused by strengthening the concept of their personal and being healthy.

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# The analysis of Caesarean Section Rate based on 10 groups Robson's Classification

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Abstract

**Introduction:** Caesarean Section use is growing in a progressive rate globally. The trend in Albania follows the same pattern with the overall rate rising steadily. Specifically, in "Koco Gliozheni" Hospital the data went up from 29.5% in 2010 to 43.41% in 2020. The World Health Organization recommends the Robson Classification as an effective way of monitoring and analyzing caesarean section .

**Objective:** The aim of this article is to evaluate the cesarean section rate at UHOG "Koco Gliozheni".

**Material and method:** This is a retrospective cross sectional study conducted at UHOG "Koco Gliozheni" in Tirana from January 2016 to May 2017.

**Results:** 1918 out of 4838 births were performed by caesarean section, which corresponds to a rate of 39.6%. According to Robson classification the largest group was the group 5 with a relative contribution of 31.6%. On second and third place were group 1 and 2 with relative contribution of 22.5% and 16.7% respectively. Groups 1;

2; 5 made an account of relative contribution of 76.2%. All other groups had altogether a contribution of 23.8%.

**Conclusions:** In our study, Robson Groups 5, 1, 2 were identified as the main contributors to the overall CS rate at the UHOG "Koco Gliozheni". It is important that efforts to reduce the overall CS rate should mainly be focused on the primary CS rate (group 1 and 2) and on increasing vaginal birth trail after CS (group 5).

**Keywords:** Caesarean Section Rate, Vaginal Birth, Robson Classification

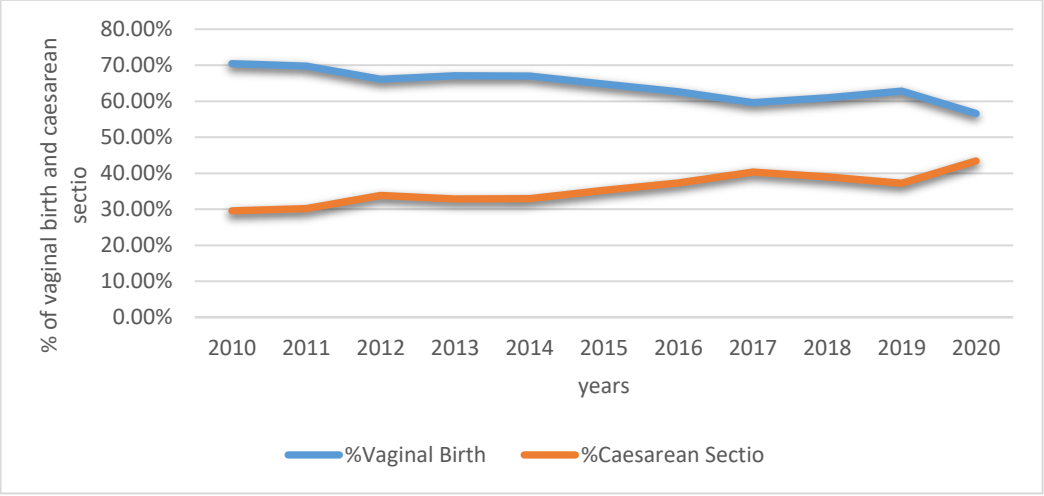
## Introduction

Caesarean Section use is growing at a progressive rate globally, accounting for 21% births worldwide in 2015 from 12% in 2000 (Boerma, Ronsmans , & Melesse, 2018). According to

recommendation made for proper prenatal and births care, from a Joint Conference Appropriate Technology for Birth, organized by World Health

Organization in 1985, there is no justification in any specific geographic region to have more than 10-15% Caesarean Section births (WHO, Appropriate technology for birth, 1985). This rising rate is a crucial public health problem, thus causing debatable questions due to the potential risks both maternal and perinatal.

**Figure 1:Trend of Caesarean Sections and vaginal births in "Koco Gliozheni" Hospital during 2010-2020.**



Additionally cost issues and accessibility have promptly become a concern. Statistically across the US overall CS rate was 32% in 2017 (Cunningham, 2018) compared to approximately 20% in 1996. In UK CS deliveries have increased 19.7% of birth in 2000 to 26.2% in 2015 (Boerma, Ronsmans , & Melesse, 2018). According to Lancet in at least 15 countries the CS rate exceeds 40%, including Brazil, 55.5% Turkey (Bazelian, 2007) and Egypt 53.1% (Jadoon, 2019). Kosovo, a country with the same ethical traits as Albania is experiencing a swift growth in CS rate. From 2000 to 2015 the figures have increased from 7.5% to 27.3%. The trend in Albania follows the same pattern with the overall rate rising steadily. More specifically in "Koco Gliozheni" Hospital the rate has fluctuated during the years. Firstly it climbed from 29.5% in 2010 to 40.35% in 2017, then it went down to 37.2% in 2019, jumping to 43.41% in 2020. One of the main factors that may have contributed to the sharp rising trend in 2020 is Covid -19, whose adverse effects in maternal health play a crucial role **(Figure 1)**. In order to understand the drivers of this trend, different authors have created and proposed a consistent and standardized classification known as Robson Classification. Many countries use this randomly in their studies ,while other like Albania have not implemented it yet. According to WHO the Robson's Classification is for "all women" who delivered at a specific setting and not only for the women who delivered by Caesarean Section (WHO, Robson classification: implemention manual World Health Organisation, 2017). The groups of the Robson classification include variables: Parity, Previous Caesarean Section, Onset of labor, Number of foetus, Gestational age, foetal lie and presentation (Robson, 2001).

## Objectives

The main objective of this paper is to report an analysis of the CS rate in our hospital "Koco Gliozheni" using the 10 group Robson Classification and to determine trends on a time period from 2016-2017 .

## Materials and Methods

This is a retrospective cross–sectional study at the obstetric department of the University Hospital of Obstetric and Gynecology "Koco Gliozheni|"from January 2016 to May 2017. The UHOG "Koco Gliozheni" is a tertiary University hospital supported by 24 hours obstetrics team, pediatric services, anesthetic and neonatal department. This study includes all women who gave births to alive or still born baby of at least 28 weeks gestational age during the above mentioned time period. We have used this cut off for definition of birth ,because the threshold of viability in many low-income countries is birth weight ≥ 1000 g and gestational age ≥ 28 weeks. The obtained data were maternal age, parity, gestational age, onset of labor, foetus presentation,

previous deliveries and previous CS. The data were categorized into 10 groups according to the Robson Classification

System (**table 1)**. The groups are as below: Group 1 Nulliparous woman, single cephalic presentation in spontaneous labor. Group 2 is divided in two subgroups: 2a Nulliparous single cephalic presentation in spontaneous labor, 2b Nulliparous single cephalic presentation planned caesarean delivery. 3 Multiparous women without uterine scar, single, cephalic, term pregnancy in spontaneous labor. Group 4 is divided in two subgroups: 4a Multiparous women without uterine scar, cephalic, term, pregnancy in induced labor and 4b Multiparous women without uterine scar, cephalic term pregnancy, planned cesarean delivery. Group 5 Multiparous with scarred uterus, single, cephalic, term pregnancy. Group 6 Nulliparous single, breech pregnancy. Group 7 Multiparous single breech pregnancy (included women with scarred uterus). Group 8 All women with multiple pregnancy (include them with scarred uterus). Group 9 All women with single or oblique pregnancy (include them with scarred uterus). Group 10 All women with single cephalic preterm pregnancy (include them with scarred uterus). Those variables needed to be analyzed for our study were parity, gestational age, foetal presentation, and previous caesarean section. Statistical analysis and graphics presentation were performed using EXEL 2010 and Microsoft office programs. All missing data cases were excluded from the study.

## Results

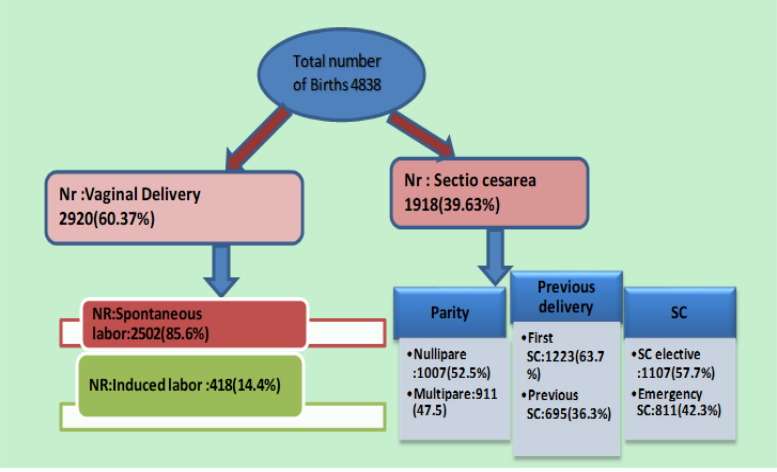



Figure 2:Distribution of Caesarean Sections and vaginal births

During our study period from January 2016 to May 2017, 4838 women gave birth at University Hospital of Obstetrics-Gynecology"Koco Gliozheni", Tirana:

1. Nulliparous; single cephalic term pregnancy; spontaneous Labour

2. a. Nulliparous; single cephalic term pregnancy; induced labour

2. b. Nulliparous; single cephalic term pregnancy; planned caesarean delivery

3. Multiparous without uterine scar; single cephalic term pregnancy; spontaneous labour

4. a. Multiparous without uterine scar; single cephalic term pregnancy; induced labour

4. b. Multiparous without uterine scar; single cephalic term, planned caesarean delivery

5. Multiparous with scarred uterus; Single cephalic term pregnancy

6. Nulliparous; single breech pregnancy

7. Multiparous; single breech pregnancy (including women with scarred uterus)

8. All women with multiple pregnancy (including women with scarred uterus)

9. All women with a single oblique or transverse pregnancy (including women with scarred uterus)

10. All women with single cephalic preterm pregnancy (including women with scarred uterus)

**Table 1**:The ten group Robson's Classification

There were 2388 nulliparous (49.38%) and 2450 multiparous (50.65%). CS was performed in1918 women resulting in an overall CS rate of (39.63%). The number of CS performed to all

nulliparous and multiparous during this period of time was 1005 (52.5%) and 911 (47.5%) respectively. The rate of elective CS was 57.7% while that emergency CS was 42.3%, **(Figure 2)**. We attempted to categorize CS according to Robson Classification and rates of each group were demonstrated separately (**Table 2)**. The largest contributors to the overall CS rate were women with previous CS (group 5, multiparous with scarred uterus ) 12.45%. CS rate within this group was 90.6% (602 out of 664 women). 456 out of 664 women (68.67%), had performed a CS prior to the onset labor (elective CS). 148 (31.33%) of women of this group, had attempted a VBAC ( vaginal birth after Cesarean Section). A significant number of these

multiparous, with at least one previous vaginal birth. The second highest contributors were women included in group 1 (singletons nulliparous, cephalic presentation, at term, spontaneous onset of labor ), with an overall CS rate 8.9% and with relative percentage of 22.5%.

The group 2 (nulliparous with single cephalic,

full term pregnancy, included labor or pre labor CS) had the third contribution with 6.6% of overall CS rate and a relative contribution of only 16.7%. If we analyze the group 2, we find that the 2b subgroup (elective caesarean delivery) had a contribute with a 6.3% of overall CSR and with a relative contribution of 16.3%.

**Discussion**

Over the last decades, there has been a progressive increase in the rate of deliveries by caesarean section (CS) in most countries but the drivers for this trend are not completely understood (BetránAP, 2016). Health Organization (WHO) conducted a systematic review that identified 27 different systems to classify CS. These classifications looked at "who" (woman-based), "why" (indication-based), "when" (urgency-based), as well as "where", "how" and "by whom" a CS was performed (Torloni MR, 2011). This review concluded that women-based classifications in general, and the 10 Groups classification in particular (MS, 2001), were in the best position to fulfill current international and local needs. The 10 Groups classification (also known as the "TGCS Ten Groups Classification System" or the "Robson Classification") was created to prospectively identify well-defined, clinically relevant groups of women admitted for delivery and to investigate differences in CS rates within these relatively homogeneous groups of women (MS, 2001). WHO expects that the use of the Robson Classification will help health care facilities to: • Identify and analyze the groups of women which contribute most and least to overall CS rates. • Compare practice in these groups of women with other units who have more desirable results and consider changes in practice. • Assess the effectiveness of strategies or interventions

targeted at optimizing the use of CS. • Assess the quality of care and of clinical management practices by analyzing outcomes by groups of women. • Assess the quality of the data collected and raise staff awareness about the importance of this data, interpretation and use (https://creativecommons.org/licenses/by-nc-sa/3.0/igo)., 2007).

Our study reports the data from low income countries like Albania. During the study from January 2016 to May 2017, gave birth 4828 women,1918 (39.63%) out of 4839

performed CS. The rate is higher than developed countries like France (31%), Australia (28%), USA (31.1%) and lower than Egypt (54%), Turkey (51.9%), South America (42,9%). The main contributor to the overall CS rate were group 5, 1, 2. Group 5: (multiparous with prior caesarean section, singleton, >37 weeks): provides the highest contribution with 31.6% of all CS and with 90.6% CS rate of women in this group much higher than Robson's references (50-60%). On further analysis we conclude that 68.67% of women in this group had an elective CS and only 31.33% of women had attempted trail of labor after CS (TOLAC), even though VABC has a success of 75% (Williams, 2018). In some studies in low income countries, success of VBAC is as low as 27.4% to 53.6% (Agrawal, 2007). But on the other hand, countries with high socio- economic status, reported a higher CS rate from group 5 (multiparous with prior caesarean section, singleton, >37 weeks) respectively 61% and 47% (Zhang, 2016).

| Group nr | Total nr of women delivered in each group(N) | Total nr of CS in each group(n) | Group size (%) | Group CSR(%) | Absolute group contribution to overall CS rate(%) | Relative contribution of the group to overall CSR (1978CS)% |
|---|---|---|---|---|---|---|
| 1 | 1507 | 432 | 30.3 | 28.6 | 8.9 | 22.5 |
| 2 | 550 | 321 | 11 | 58.3 | 6.6 | 16.7 |
| 3 | 1309 | 86 | 27 | 6.5 | 1.8 | 4.5 |
| 4 | 227 | 57 | 4.6 | 25 | 1.2 | 2.9 |
| 5 | 664 | 602 | 13.7 | 90.6 | 12.45 | 31.6 |
| 6 | 135 | 128 | 2.7 | 94.8 | 2.6 | 6.7 |
| 7 | 79 | 66 | 1.6 | 83.5 | 1.4 | 3.4 |
| 8 | 90 | 78 | 1.8 | 86.6 | 1.6 | 4 |
| 9 | 23 | 23 | 0.47 | 100 | 0.48 | 1.2 |
| 10 | 254 | 125 | 5.2 | 49.2 | 2.6 | 6.5 |
| Total Number | 4838 | 1918 | 100% | 39.63% | 39.63% | 100% |

Table 2:Robson report table for University Hospital Center Obsteric-Gyneocology "Koco Gliozheni"

Group size (%) =n of women in the group.total number N women delivered in the hospital*100

Group CS rate (%) =n of CS in the group/total N of women in group*100

Absolute contribution (%) =n of CS in group /total N of women delvered in hospital*100

Relative contribution (%) =n of CS in group/total N of CS in hospital*100

CS (Caesaren Section)

Color signifies the high-risk group

Some of the factors that contribute to the decreasing of percentage of VBAC are myths such as "Once a caesarean always a caesarean", lack of training and malpractice. Uterine rupture is a possible complication during vaginal birth with a scarring uterus, but studies calculate the risk from 0.2% to 0.8% (ACOG, 2010). Group 1: (CS performed during labor) contributes with approximately 22.5% of CSR, and 28.6% within the group. Referring to Robson's finding, this group should account for no more than 10% (WHO, Robson classification: Implemention Manual, 2017). The high rate of CS in our Hospital can be explained by the lack of infrastructure**.** For instance, the well-being of foetus during labor has been monitored by intermittent CTG and sometimes only with feotal stethoscope.

Furthermore, reasons like insufficient training of staff for CTG interpretation, lack of other foetal assessment such as foetal scalp blood sampling and cord blood PH play a crucial role. Given that, the doctors have to make a decision based only in CTG findings. Additionally, epidural or any other anesthesia is not performed regularly in our everyday practice. The instrumental deliveries have reached at a critical low point, not only in "Koco Gliozheni" Hospital, but globally. Group 2: (Nulliparous women cephalic at term induced labor or elective CS) has the third highest contribution, with 16.7% of overall CSR and 58.3% within the group. Robson's rate references for this group are 20-35%. After a thorough analysis, we conclude that different from references, the subgroup 2a (induced labor) is relatively smaller than 2b (elective CS). This can be explained with underreported procedure of labor induction on patient's files. The elective section (2b) is mostly performed for nonmedical indications. The most common reason is the request of the woman as she refuses to try the vaginal birth, due to anxiety, fear of pain, and concerns of pelvic injuries. If we analyze the numbers in the subgroup of elective Caesaren (2b), we conclude that the group contributes with 16.3% of overall CSR and with 54.4% within the group. So it is a considerable percentage, compared with the contribution of group 2 itself in total. Group 3-4 (multiparous women at term induced or elective CS) have a relatively low contribution, which reaches all together 7.4%. They are labelled the "low risk group". Groups 6 - 10 were smaller groups with an overall size of 11.77%, and with the highest group CSR that reach up to 100% in group 9 (all women with single pregnancy with transverse or oblique lie, including women with previous uterine scar). This group are presented with an unavoidable obstetric condition (like

breech presentation, multiple pregnancy abnormal fetal presentation or premature birth, several maternal obstetrical conditions) that has been served as medical indication for CS. But on the other hand the contribution to the overall CSR is lower and reaches only 32%.

## Conclusions

In our study, Robson's groups 5, 1, 2 were identified as the main contributors to the overall Cesarean Section rate at the "Koco Gliozheni"

University Hospital, Tirana. It is important that the effort to reduce the overall CSR, should mainly be focused on the primary CS rate (group 1 and 2) and increasing the attempt of vaginal birth after cesarean section .We believe that this classification can be incorporated successfully in the routine of obstetrical management, and implemented in the collection of maternal and perinatal data system to improve the evaluation of Caesarean Section rate. We consider that future work should be done to harmonize data between different countries, so more detailed collection systems and protocols are obtained.

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**Conflict of interest** None declared.

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# Time Management Experience for 1st Year Students of the Faculty of Medicine

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## Abstract

Rīga Stradiņš University (RSU) has almost 70-year-experience in implementing health care and 20-year-experience social science studies. RSU has more than 9000 students, 26% of whom are international students. Beginning of studies at Rīga Stradiņš university (RSU) Faculty of Medicine, students have to change several aspects of studies compare to high school: much deeper study content and scope of studies, type of learning, more emphasis on full-time work, practical class and lecture schedule for day, week, semester, types examinations and their regularity, new organizational culture, study year members, study course lecturers, must learn new concepts, such as matriculation, study regulations, study course, department, colloquium and others. Some students of the Faculty of Medicine do not set priorities in time and end up lacking time, do not fulfill their goals, are not satisfied with their study results, even have health problems. Therefore, time planning, selection of appropriate study strategies, setting priorities is a challenge for 1st year students and lecturers to make a pedagogical contribution to help students successfully move forward in the study process. The aim of the research is to find out the student's opinion about time management, the set goals and their implementation and implement and test a support system at the university level.

**Keywords:** time management, time planning strategies, self-discipline, effective support.

## Introduction

### Theoretical background

Time management and setting priorities are skills that each student and lecturer at the university develops on daily basis. Often, we each encounter difficulties, such as

too much work to be done in one unit of time. This most often indicates errors in work planning. Another typical example of errors are delays and non-compliance with deadlines in setting priorities.

We each begin to learn time management skills firstly in the family and then continue to do it in school, and they will be needed throughout our lives. At school, you learn how to organize your time, how to set and follow your goals, how to organize your work, how to develop and improve self-discipline skills. At the same time, personal responsibility is being improved. According to the current educational standard in Latvian schools in social lessons students learn to analyze their strengths and weaknesses, learn strategies on how to improve their weaknesses, learn basic time management skills.

It is just as important to learn to be aware of your strengths, where and how to use them. Therefore, when starting their studies at the university, students use the acquired skills, but as the data of our research show, time management skills for students are developed at a different level.

As experts from other universities admit, then a time is a finite resource. Balancing responsibilities at your job, home, and school is not easy. No matter what, you're always left with the same 24 hours in a day to check items off to-do lists, spend time with family and friends, and unwind. By planning ahead and using your time wisely, you'll be able to accomplish more and enjoy added free time (Purdue University, 2018.)

Learning and comparing how to manage your time better will help you maintain academic performance as well as a life outside of school (Brown, 2017; Garbugli, 2017; Purdue University Global. Time Management Tips for Busy College Students, 2018; Princeton University The McGraw Center for Teaching and Learning, 2016).

Not only medical studies are taught about time management, but mastering any specialty and all recommendations could be see common: setting and achieving goals, self-control and self-discipline, real time deadlines, rewarding yourself, concentration, assistance.

Dartmouth Academic Skills Center experts emphasizes that define long-term and short-term goals and build your schedule around them, examine and revise your lifetime goals on a monthly basis and be sure to include progress towards those goals on a daily basis. Experts recalls that keep paper or a calendar with you to jot down the things you have to do or notes to yourself.

Therefore, Purdue University experts also describes what is already known the Pomodoro Technique, developed in the 1990s, work in short intervals and take short, regular, timed breaks or "Pomodoros."

E. Garbugli from Duke University say that work around procrastination. Procrastinate between intense sprints of work. Always prioritize. K. Farid from Ain Shams

University published in the Procrastination Research 2021 that in procrastination study, a widely used meaning is "the putting off of what is required to achieve some goal", but there is a difference as The delay of working on smaller or less important duties that interrupt Significant tasks which need to be completed is not considered procrastination but a wise and effective way controlling their time so it goes without saying that When a person chooses to postpone finishing an important task in order to achieve a more favorable as hanging out with colleagues is a typical form of procrastination.

Princeton University The McGraw Center for Teaching and Learning experts emphasizes important principles as commitment and recommends to be brutally realistic, not idealistic when making your schedule and "I'll get the most out of this time." Leave empty time slots, and schedule in recreation time. Also make time for enjoyable, rejuvenating and satisfying activities like organizations, sports, and entertainment. One thing at a time, when switching we lose the depth of our engagement, absorption. Principle First Things First means that schedule the things that are most important to you first thing in the day, or at the first available time slot. Think how do you incorporate flexibility into your schedule and be ready to reduce the amount of time, but don't compromise on your health. Don't let "mindgames" in which you create justifications get in the way or lead you astray. Another important principle is organizing your environment—both physical and social. Choose carefully where you study and use physical reminders, for example, if you want to work out more, but are getting bogged down in email or Facebook, put your running shoes on top of your laptop.

Summing up theoretical findings here are the main components from time management tips (Figure 1) that will help you build strong time management skills in medical school, when you need them most.

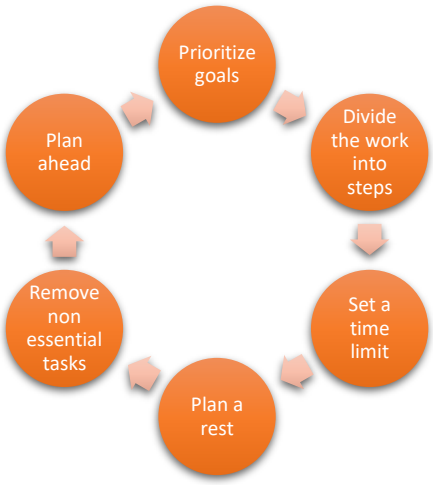


Figure 1. Time management tips

**Materials and methods.** Qualitative and quantitative methodology is used in the research: questionnaire for 1st year students Faculty of Medicine (N=405), focus group with field experts (N=5), student group leader (N=54) focus group twice in each academic year, up to 8-10 group leaders in each focus group.

The data obtained in the study were recorded in audio recordings, transcripts were prepared and Microsoft Excel 2016, IBM SPSS 26 program was used for the analysis. Personal data protection was ensured in data collection, processing and analysis.

In the 2014/2015 academic year, three focus group discussions were organized with the specialists of the RSU foreign department on the accumulated experience in organizing adaptation and introduction days for foreign students who come to Latvia and start their studies at our university.

The experience and documents of other universities were analyzed. The obtained data and conclusions were taken into account when creating the materials of the study course ''Time Planning and Management'' for the 1st year medical students and to start the implementation of this course in the 2016/2017 academic year.

The table shows the main content and study outcomes which we defined when creating to study course *Time Planning and Management.*

| Content | Study outcomes |
|---|---|
| Study process in RSU | Explain: differences between the study process at school and university.<br>Memorize about:<br>Strategy and structure of RSU, study process organization, regulatory documents, Regulation of Ethics, RSU history, values and traditions; the structure and competence of the medical faculty.<br>Schedule of lectures and practical classes, agenda of study course examinations, general, special and current information. |
| academic integrity | Discuss about:<br>Basic principles and concepts of academic integrity such as cheating, falsification of results, plagiarism, etc., as well as way how plagiarism is checked at RSU.<br>Making references in essays, reports and scientific papers.<br>What literature sources are reliable to use.<br>Possible consequences if academic integrity is violated. |
| study environment in RSU | Use:<br>wireless internet, photocopying services.<br>RSU Student Portal, e-studies.<br>RSU Library and Student Service, Career Center services.<br>Services of the Open University and Medical Education Technology Center.<br>calendar of the academic year. |

| | |
|---|---|
| | opportunities for after studies activities (sports, artistic activities, etc.).<br>Know: how to can apply for a scholarship; involve the mentor / curator in problem solving and to establish correct communication with lecturers.<br>a student emails<br>Elected group leaders, course leaders, their responsibilities. |
| Student government | Memorize about:<br>Structure and representation in the common RSU structure.<br>Group leaders, course leaders, their responsibilities<br>Solutions of the problems.<br>Activities and events. |
| Time management | Discuss about:<br>efficiency, strategies, effectiveness and productivity of time planning, self-discipline during the semester and the session. |
| Study aim | more successfully to the study process at the university. |

After the implementation of this study course, a student survey was conducted. The survey included a total of 17 both open-ended and closed-ended questions and was conducted for three consecutive years (2018, 2019, 2020). Student involvement were voluntary.

The data of the survey results were analyzed by considering the following parameters - year, age group, gender, time management skills and when the goal to study medicine was set. Of the total number of respondents, 78 men, 321 women, 6 do not indicate gender. In total, 211 students participated in the survey in 2018, 150 students in 2019 and 44 students during distance learning in 2020. Distribution of respondents by age groups: 106 respondents in the age group 17-18 years, 237 respondents in the age group 19, 58 - 20 and more years, 4 - no answer. They had to rate their time management skills on a scale of "0 or 1" - no skills or very poor, "2" - bad, "3" - average, "4" - good and "5" - very good. when the goal was set to study medicine, there were categories: childhood, elementary school, high school, recently, before starting studies, another answer.

On a scale of 0-5 (0 - no need; 5 - very necessary) it was also necessary to assess the need for time management skills for medical students and whether medical students have differences in time management compared to students of other study programs or fields.

The obtained answers were grouped into categories to compare with the age at which the goal was set and the self-assessment of time management skills.

The research design consists of research methods, goals, target audience, research time distribution and the main result of each research phase (Figure 2.).

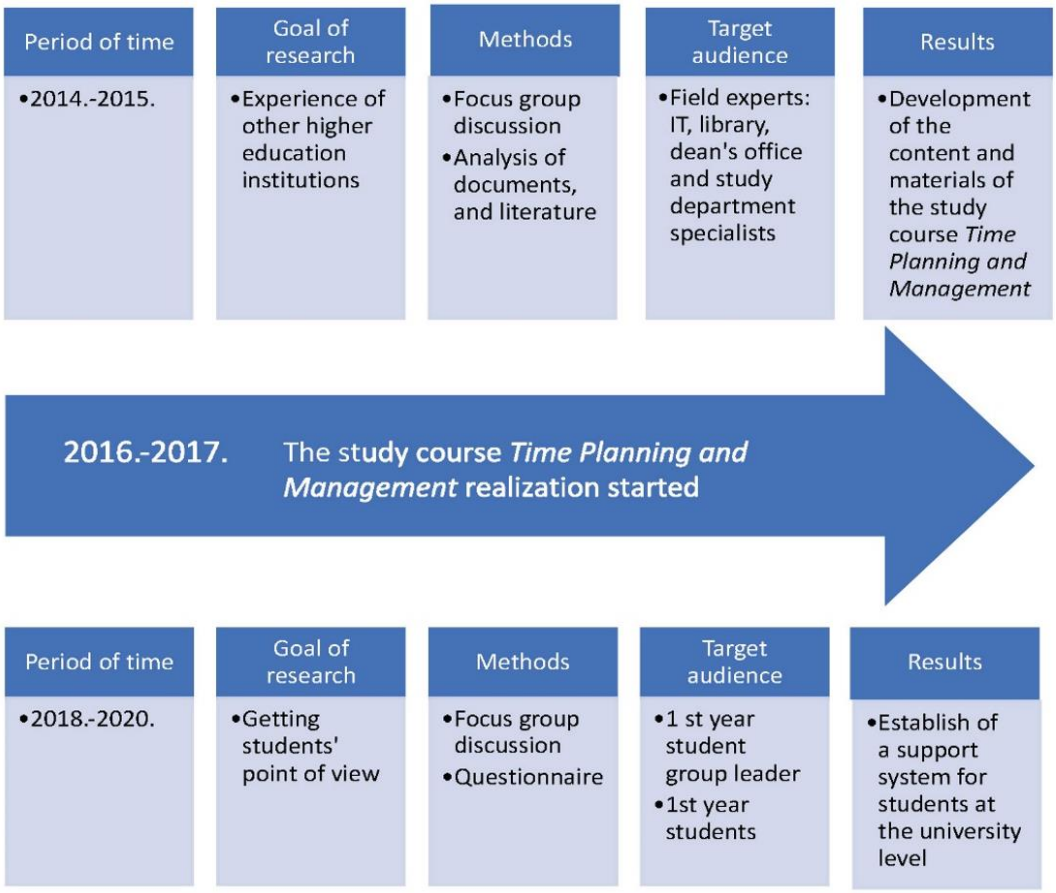


Figure 2. Research design

**Results**

According to research in other universities as a medical student, one of your biggest career goals is to become a doctor (Dyer, 2021). This takes years of hard work and dedication to learning medicine and the art of patient care. That means setting goals and creating plans of action to help you achieve them.

In the following, we will analyze the data in three parts. All parts combine: the goal to study medicine.

1. When was the goal of studying medicine set?

2. What could affect the change of goal?

3. What additional goals related to medical studies could be set?

**Part I of the study "When was the goal of studying medicine set?"**

Analysis of real-life stories - why I chose medicine, students admit that the sooner a prospective student sets a goal to study medicine, the more purposeful and successful the study. Therefore, we looked at the data in terms of when the goal to study was set. Total number of respondents n = 405. In the analysis of the results we conclude that the trend is similar in all years, basically this decision is made in secondary school n = 160, then successively in primary school n = 114, in childhood n = 80, least n = 49 recently, before starting studies, and it is taken by 18% of men and 11% women.

To clarify one of the research tasks, we used the answers of the open-ended questions and grouped them in the following categories (Figure 3.):

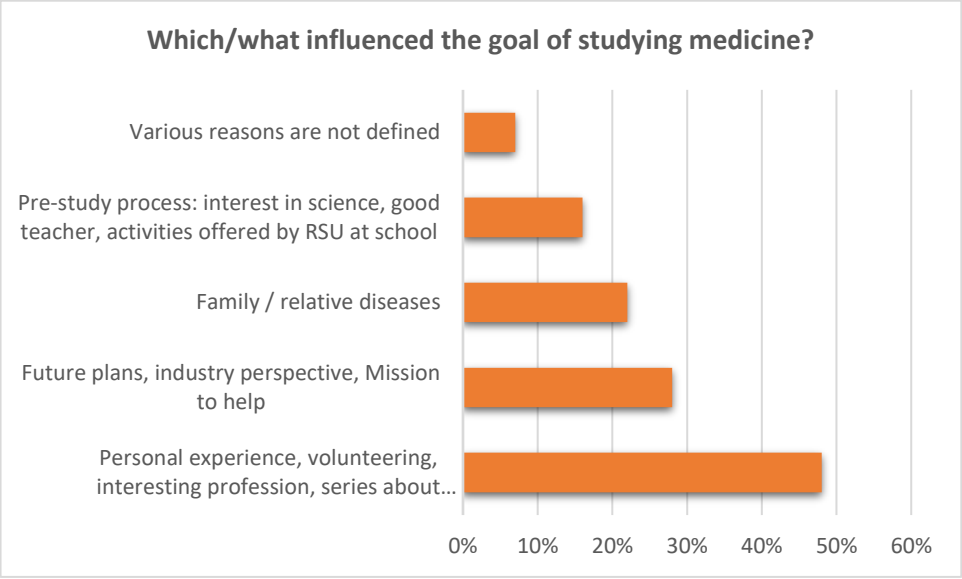


Figure 3. Which/what influenced the goal of studying medicine?

Comparing the obtained results, a logical regularity can be seen, if the choice of goal was influenced by "Personal interest and experience, volunteering, interesting profession, doctors", then this goal was set by 53% recently, before starting studies, equal distribution in 51% , because the experience gained in practice has facilitated the choice to study medicine and 52% evaluate their time planning skills as very good, there is no significant difference in the age group and gender.

Student A. writes: *"Working in a medical institution, seeing the work of a doctor, I decided to study medicine... when I watched the surgery I realized that it really fascinates me"*

28% of students noted that their choice is related to the future prospects of their profession, mission to help, then in this case the answers obtained are equal: 27% set goals in childhood and primary school, 30% in secondary school, 26% recently, before

starting studies. In the assessment of time planning skills, 35% are rated as very good and 35% as very bad.

*"From childhood I was interested in medicine and there was a desire to work with people. I also like that studying medicine every day is a challenge. I was very attracted to the opportunity to help people, the doctor's daily life. "*

*"This profession seems prestigious and interesting (you have to study for a long time, you like to study. The field of medicine is something that is necessary for humanity, it benefits humanity and, of course, medicine is vital for the successful growth of the nation and country. That's why I chose to study medicine, to do something good and necessary for people "*

For 22% of students, the goal was influenced by family experience, their own or relatives' illness, so these students have chosen their goal the earliest - in childhood - 35% and only 8% decided recently before starting their studies. There are no significant differences in the age group, by gender. 26% rate time management skills as very good and 27% as very bad. Statically different this indicator is in 2019 - 17%, compared to 2018 - 26%

"*there is a doctor in the family and the work of a doctor has always seemed very interesting and attractive to me personally." "Both parents are doctors and I had to spend a lot of time with doctors. When I spent time in an environment without medics, I realized what I was missing"*

*"I was in close contact with doctors / surgeons because I had several serious surgeries. I realized that I wanted to help others just as I was helped when I had health problems."*

16% of students noted that an important role in their choice has been to the study process before the university, citing a variety of learning activities, such as biology and chemistry lessons, the teacher, participation in various school and extracurricular circles, including RSU organized lectures and practical classes for students. Statically significant results show that 27% set goals in secondary school and only 4% in childhood and also 4% recently, shortly before the start of studies.

In this case, no student rated their time management skills as very poor, and 9% rated them as very good. It should be noted that a significant difference in this measurement was 20% in 2018 and only 7% in 2020. We explain this with various activities organized in person in Latvian schools, for example, RSU student-journal discussions, lectures, talks with students, which could facilitate faster decision-making in the field of medicine.

"*This goal was influenced by the fact that subjects related to anatomy and medicine seemed to be the most interesting when studying biology and chemistry in primary school."*

*"In-depth interest in biology; attending various seminars related to biology and medicine; Branch of the Academy of Young Doctors in Valmiera; and other competitions and Olympiads interested in studying medicine".*

*"Excursion to the scientific center" Aha "in Tartu, Estonia, where it was possible to study the pig's eye."*

7% of students chose the answer chosen by various reasons, for example, series about doctors, books, publications, then 14% of this decision was made recently, before the start of studies, 8% in secondary school, 4% in childhood and also in primary school. For example, "*...I didn't see myself in any other industry and saw it as my calling.*" or a student writes: ... *I liked the white robe... I was impressed by the series "Emergency room*". Statically different results were only in this category between the genders, 13% of men and 5% of women had answered different reasons have influenced their choice to study medicine.1% of respondents had not answered this question.

**Part II of the study: What could affect the change of goal?**

Often students drop out of medical studies already in the first year of studies. By analyzing the answers to the open-ended question: "What could affect the change of purpose?", We could identify problems in a timely manner and provide support. 26% of students did not comment on the change of goals. All other obtained answers were grouped in the following categories (Figure 4.):

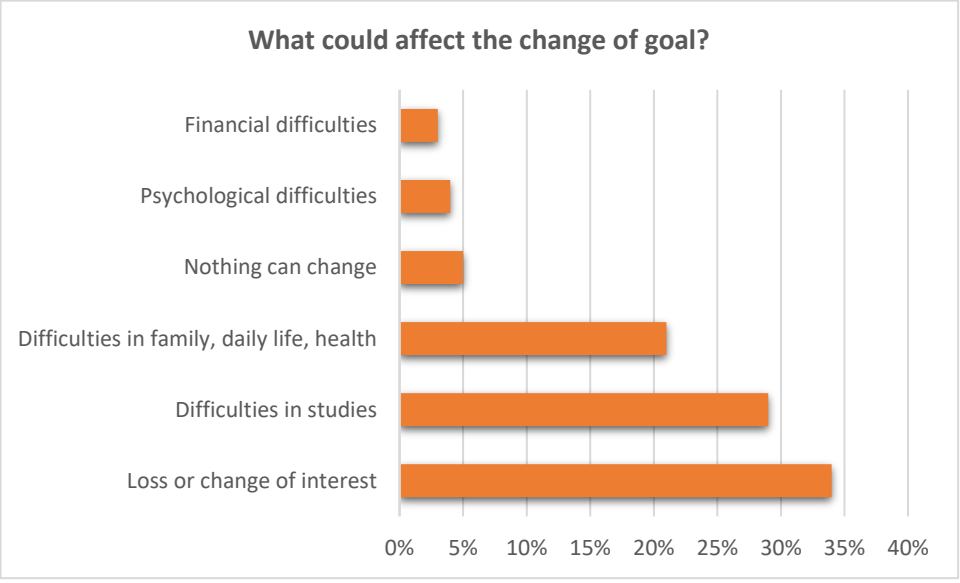


Figure 4. What could affect the change of goal?

In the analysis of the results, we conclude that the loss of interest and change of categories have been chosen differently by study years in 2018 47% and comparatively by year only 17%, while older students have chosen the least this

answer 15%, while younger ones 35%, which could indicate about the search for their own path and another profession, and these students could drop out of medical studies if they do not create fulfillment, interest, do not see themselves in this profession or do not want to devote so much time to learning the content.

"*Since only two months of study have passed, I assume that the goal of studying medicine may change. There are other areas of healthcare in which I am also interested, I have not decided anything 100%."*

*"There will be other interests, I don't want to put too much effort into achieving the goal."*

*"Gaining experience, getting to know the real work environment."*

29% of students write that one of the reasons for dropping out of medical studies is that they will not be able to cope with the heavy workload, that they may not pass the tests, that they may run out of time. 41% of students rate their time management skills as poor. This category is mentioned equally often in all years of the study and is not answered differently between women and men, and there is no difference in the choice of target. Naturally, older students mentioned it less - 19% than younger students - 31%, because they are more confident in choosing their next profession. Therefore, it is important for lecturers to notice the difficulties encountered by the student in the study process as early as possible, to invite them to individual consultations, to try to find a solution together.

"*Difficulty adapting to the new, more complex way of life and study."*

*"Very great difficulties in studies, outstanding colloquia or exams, revelations that I do not learn the content."*

*"Excessive workload, my poor ability to plan time, set priorities."*

21% mention various circumstances for changing their goals, and most often they are difficulties in family, everyday life or health. Students mention this reason less in 2019 - 14% compared to 2018 - 27%. The result was not measured during distance learning. Surprisingly, this category was less mentioned by older students 19%, who may have already experienced more difficulties in life compared to 26% of students who set a goal in childhood.

"*Dramatic changes in personal life, health problems, family circumstances, change of residence*."

5% of students are absolutely convinced that nothing can change the goal. Statically, the difference is 7% in 2018 and 3% in 2019, as well as older students 9% and younger 3%. Students rate their time management skills as very good 4% and no students rate them as very bad. Data on the time when the goal was set, 2% recently and 6% in childhood, also show a targeted choice.

"*Nothing can change, because I want to improve the overall public health care system, the social guarantees of medical staff*."

In the category of psychological difficulties, we collected answers in which students write that they may not fit into the team, that there may be disagreements with colleagues, lecturers, that they are afraid that they will not be able to look at blood and other medical manipulations. The group leaders confirm in the focus group discussion that such problems are real. In 2018 again more 6% and after a year 1%. It should be noted that older students did not give such an answer compared to younger ones. In addition, 7% of these students rate their time management skills as weak and no student rated their time planning skills as very good.

"*There will be no friends" understanding that human nature is not fit for purpose. Conflicts with group members or lecturers."*

*"Better acquaintance with the personality, personal experiences that change specific beliefs."*

*"A new place to learn and young people around, which means adaptation and a possible change in habits*."

Lack of funding was mentioned in 3% and there are no significant differences between the study years and the answers between women and men, naturally older students mentioned 9% more answers than younger 2%. In turn, their time management skills are assessed as weak 6% and very good 4%. This answer is mentioned by at least 1% of students who set their goal in primary school, compared to 2% of students who set a goal recently.

"Changing life situation - especially when the family / financial situation changes."

**Part III of the study: What additional goals related to medical studies could be set?**

In Part III of the study were asked an open-ended question "What additional goals related to medical studies could be set?" and the obtained answers were grouped into categories (Figure 5.):

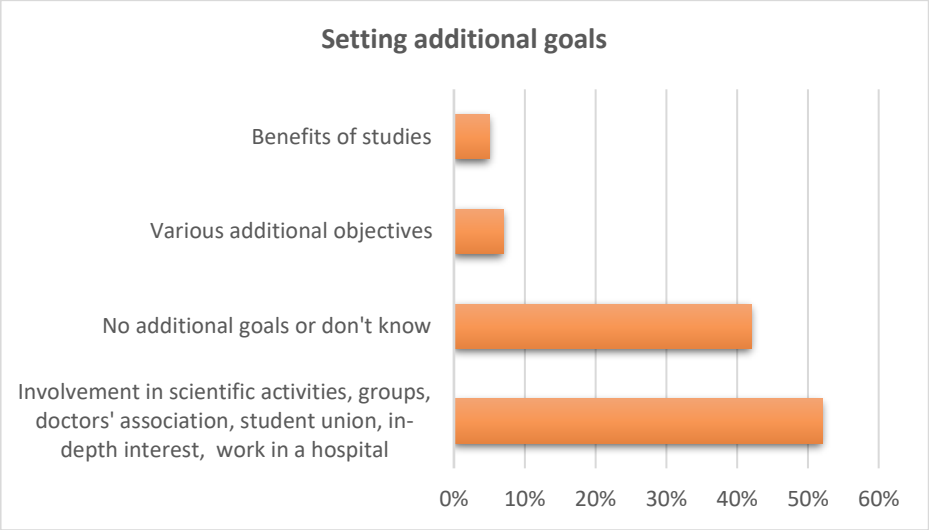


Figure 5. Setting additional goals

Involvement in scientific activities, groups, doctors' association, student union, in-depth interest, specialization in the field, work in a hospital, medical institution, such as emergency medical service, some students also plan their career as RSU lecturer, students plan to participate in ERASMUS program, study in residency, doctoral studies, plans to open their own medical practice and some students plan to continue their careers abroad, to become a doctor in more than one field. There are no significant differences in the age group, but in 2019 this additional goal is mentioned by 44% less than in 2018 by 58%.

*"Desire to develop in one direction, I want to participate in student union."*

*"Excellent for graduating from university, studying for a residency and then a doctoral study."*

*"Improve the overall state health care system, social guarantees for medical staff."*

There are no significant differences in the assessment of your time management skills. In turn, only women have mentioned continuing their career as an RSU lecturer, while the goal of studying medicine is set at 60% in childhood, which is the highest reading in this category.

*"Participation in a student scientific conference to gain a variety of experiences. I am very interested in attending scientific groups, writing scientific papers, working in a hospital. I want to find out the mechanism of gene mutation and find a way to solve it."*

*"Continuing my studies to become a professor of a medical field. Also enter and graduate from the Faculty of Dentistry to practice facial / maxillofacial surgery."*

*"Establishment of the clinic, conducting lectures, becoming a member of the RSU team-lecturer, rector... (in the future)."*

However, 42% do not know yet, they do not have an idea about additional goals yet, most often they answer that they will still arise during their studies. There is a statistically significant difference between the years in 2018 36% compared to 2019 49%

*"I can't say. In my opinion, they will appear organically themselves as they acquire knowledge and expand. Maybe there will be an additional branch of medicine that will interest me. I think a specialty will be rethought many times."*

7% of students' answers combined various additional goals that can be formed during their studies, for example, gaining financial independence, improving a hobby, spending meaningful free time, self-improvement, making friends, a sense of mission, being a member of a corporation. This answer was written by 6% women and 13% men, and less 3% of older students than 9% of younger students.

*"Create a medical program or establish a new fund."*

*"Because medical studies are long, my goal during these years could be to start my own family."*

*"At the same time, have a good time, develop your fitness and health."*

*To become a doctor Clown, to get involved in the project "Big care for little ones" and make good contacts, help strangers, volunteer in a hospital."*

5% of students plan to get various bonuses in the study process, for example, to improve their foreign language skills, to obtain automatic assessments in exams and to study in a state-paid study program, to obtain a scholarship. Only 3% of men write about bonuses, compared to 6% of women. This answer was given the least by students who have recently set a goal of 2%, compared to 8% when the goal was set in childhood.

*"Learn another language and to work abroad."*

*"To enter the residency of a budget study place, because I want to become an anesthesiologist."*

**Conclusion and discussion** Focusing on the set goal, recognizing time thieves, choosing learning and time management strategies, self-discipline, decisions and their implementation are new challenges for 1st year students. A support system for lecturers, study year members, organizations and families are recommended and desirable.

In order to organize meaningful and purposeful development of time management skills at the organizational level, we recommend:

Continue to identify the experience of senior students, the experience of other universities and classify possible problem situations in order to offer various strategies, solutions in time and students do not arrive until the end of studies.

Development of a time management study course based on RSU experience for 1st year medical program students, which could be an approbated example in other study programs, as well as in other universities.

Based on the experience of higher education institutions of other countries, to create time management recommendations and possible solutions to real problems on the RSU website, contacts of support structures.

For discussion: data from studies in other universities that the goal may differ depending on the year of study. What are the differences between general procrastination reasons and time management skills status our university students and relation between academic year, procrastination and time management skills.

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# Changing of Health Anxiety in Disadvantaged Population During the Pandemic

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**Extended Abstract**

We have lived our lives in the spirit of the COVID-19 pandemic in the latest period, which demanded serious sacrifices in Hungary as well. By the spread of the epidemic, more and more and younger people fought with the disease, several people worried about their relatives' and friends' health. The period of the pandemic and the central provisions aiming at stopping the spread of the epidemic affected people in several different ways, but it has no doubt that confinement, restrictions and the lack of interactions had mental effects on everyone. Over the fear from becoming infected, the reorganization of the healthcare system also influenced people's mental status, and increased their anxiety and health anxiety, since the care of pre-existing chronic diseases and the diagnostics and therapy of new acute diseases were performed based on a new unknown protocol. Our research examined the population's health anxiety in a highly disadvantaged region of Hungary along more dimensions in the second and third wave of the pandemic. Our research goal was to get to know the level of health anxiety according to different settlement types, genders, ages and occupations, and to compare its change with the measured data of the option and willingness for vaccination. Our special goal was the assessment of the healthcare workers' mental status and monitoring of its changes. For the on-line survey research, we used standard questionnaires also validated in Hungarian language: the Short Health Anxiety Inventory - Hungarian version (SHAI-H) (Köteles at al, 2011), the 5-item WHO Well-being Index (Susánszky et al, 2006) and the Adult Hope Scale - Hungarian version (AHS-H) (Martos et al, 2014). During data recording, we queried labour market status, relationship status and the size of the residential settlement besides the socio-demographic data (gender, age, education). There was one question about the respondent's evaluation regarding his/her own health status and another about religiousness. There were further questions about COVID-19 infection or its suspicion in terms of the person's own and immediate environment, the severity of the perceived symptoms and the form of the necessary health care. Data recording of this current cross-sectional research was performed in the end of November 2020 and in the beginning of December 2020 at first, and then in March 2021, the questionnaire was filled by 528 persons in the second wave and 515 persons in the third wave. Although the survey, the cohort study performed by on-line sampling is

not representative, due to the size of the sample, data provide an informative picture about the mental status of the population of the North-eastern region of Hungary and its changes during the second and third wave of the pandemic. Results: The average age of the 528 persons involved in the first phase of the research was 39.4±13.1 years, the willingness to respond was similar in the second phase (N=515), and there was a small decrease in the average age (x=34.7±13.05 years). At the time of the first data recording, 16.7% of the respondents had undergone the COVID-19 infection, while this number was 24.1% in the second phase. At first, most of the people having been infected (50.4%) had mild symptoms, while 47.8% survived the disease with medium strength symptoms. When we asked about the wider environment, they reported essentially more infections: the infection could have been detected in all the respondents' households. 22.7% of those living in one household had at least one member and 77.3% had more than one infected family members. The severity of the course of the infection was different: 32% judged it very mild, 60.9% said it was medium, 3.1% of them needed hospitalization, and the course of the infection was fatal in the environment of 3.5% of the respondents. In the second phase of the research, most of the people having been infected (45.1%) had mild symptoms, while 52.6% suffered from medium strength symptoms. 37% of those living in one household had at least one member and 63% had more than one infected family members. The severity of the course of the infection was different: 26.5% judged it very mild, 58% said it was medium, 9% of them needed hospitalization, and the course of the infection was fatal in the environment of 4.5% of the respondents. Overall, the pandemic influences the population's mental status and health anxiety in an obviously negative way in the examined region, it shows correlation with subjective health status, and we do not know its long-term effects at this time.

**Keywords**: pandemic, health anxiety, subjective health status, mental well-being

## I. Introduction

The aim of our research is the examination of the population's mental health in a highly disadvantaged region of Hungary in the different waves of the pandemic. We examined stress, mental well-being, hope and health anxiety perceived among the population in the second and third waves of the pandemic by a standard, validated questionnaire along several dimensions. (Rucska & Lakatos, 2021, Lakatos & Rucska, 2021). The goal of this current study is the exploration of the level of health anxiety according to different settlement types, genders, ages and occupations and its changes, compared with the measured data of the option and willingness for vaccination. Our special goal is the assessment of the healthcare workers' mental state and monitoring the changes. Although, our results from the time of the second and third waves of the pandemic are not representative, the examination provides an informative picture about the mental characteristics of people living in North-east Hungary, especially regarding health anxiety.

## II. Literature Rewiew

In the last one and the half year, several studies and statements have dealt with the effects of COVID-19 on physical health (Cao & Li, 2020, Lvov et al., 2020) and mental well-being (Brooks et al., 2020, Csikós et al., 2020, Pfefferbaum & North, 2020, Serafini et al., 2020). The study results have continuously proved that the pandemic shows correlation with the worsening of the symptoms of depression, anxiety, health anxiety and perceived stress (Li et al., 2021, Tyrer, 2020, Xiong et al., 2020). The fear from getting ill and the stigma associated with it, social distance, isolation, existential uncertainty, the lack of information or its contradictions are associated with such negative mental symptoms as frustration and boredom, post-traumatic stress reactions, panic symptoms, anger and irritability, low self-esteem, and the feeling of loneliness and helplessness (Brooks et al., 2020). The listed negative internal conditions significantly decrease the level of mental well-being (Serafini et al., 2020).

Health anxiety is one of the most common anxiety types. In fact, anxiety related to health is the most natural reaction, everyone experiences it at least once in a lifetime. It is natural to worry about our health, and if we perceive endangering factors, we may become anxious because of the imagined negative outcome. On an optimal level, health anxiety can be considered as an adaptive process, since it helps self-care, makes people motivated to do health-protecting steps (i.e., using screening examinations), or stop or avoid health-damaging behaviour (i.e., smoking, alcohol consumption). Health anxiety can become problematic if its level affects several areas of the individual's life, it influences negatively or seriously inhibits the person in his/her everyday activities. Based on these, health anxiety should be viewed as a continuum, from the anxiety-free state to the extreme, hypochondriac anxiety. (Kosic et al., 2020, Salkovskis, 1996)

The cognitive model of health anxiety (Salkovskis, 1996) makes difference between the factors playing role in the perception of danger and the processes playing role in the persistence of anxiety. The method of thinking, misinterpretation of the signs, previous experiences and individual, dysfunctional attitudes related to the disease (i.e., every unknown physical phenomenon means an illness), and critical causing events (a friend's death or stress) belong to the first group. Factors playing role in the maintenance of anxiety occur in the fields of thinking, emotions and behaviour. Selective attention directed to the body's functions (constant self-examination), negative mental distortions, worrying about the symptoms lead to nervousness, restlessness, distress and anxiety. These generate such stress reactions that result in newer physical symptoms, then the person can misinterpret this again and the vicious circle of health anxiety starts again. All these lead to the vision of a catastrophe, increasing anxiety and behavioural changes (avoiding the thought health-damaging factors etc.). However, behavioural change can decrease anxiety on a short-term, it strengthens false believes related to the disease on a longer term, so finally, it serves their persistence. (Abramowitz et al., 2007, Wheaton et al., 2010)

Examining health anxiety on the whole population, the results suggest that its strength can be found in the continuum mentioned above: from the worry related to trivial health to the clinical level, including hypochondriasis and pathological health anxiety. On the order of the examinations, no differences could be detected in the different groups of age, gender or socio-economic status. (Kosic et al., 2020) At the same time, it is remarkable that clinical level health anxiety can often become chronic (Olde Hartman et al., 2009), it increases the person's distress level, inhibiting performing routine activities, and it decreases subjective health state. (Hedman-Lagerlöf et al., 2017) All of this is already clearly accompanied by a deterioration of the quality of life and psychological well-being. (Köteles et al., 2011; Perge & Veresné, 2021)

The COVID-19 pandemic lasting for nearly one and a half year has caused the general increase of the level of health anxiety. Studies in this topic warn for the characteristics of health anxiety related to COVID-19 and its negative consequences expected in the near future. (Asmundson & Taylor, 2020, Saurer et al., 2020, Tyrer, 2020) Since both too high and too low health anxiety may affect harmfully the individuals' and communities' adaptive reaction for the pandemic in this situation, it has become important to explore and, by the changes of the pandemic situation, to monitor its level and understand the influencing factors. (Asmundson & Taylor, 2020)

The examination of health care workers' mental health has been the subject of several statements since the spread of the pandemic. (Papp et al., 2020, Shanafelt et al., 2020) During the exploration of the level of health anxiety, research has found a higher anxiety level among health care workers compared to the average population. (Mokhtari et al., 2020, Mohd et al., 2021)

## III. Methods

### 1. Participants

The first data recording of this current cross-sectional on-line research was performed in the end of November and in the beginning of December in 2020, the second was performed in March 2021. Only people over the age of 18 could be included in the on-line survey research. Educational level, relationship status or the settlement type were not criteria in the research. Before filling the questionnaire, the participants received written information about the aim of the research.

The questionnaire was filled by 528 persons at the time of the first data recording. The second data recording was performed at the time of the Hungarian occurrence of the third wave of the pandemic in March 2021, and 515 persons filled the questionnaire in this period.

### 2. Measures

During data recording, we queried labour market status, relationship status and the size of the residential settlement besides the socio-demographic data (gender, age,

education). There was one question about the respondent's evaluation regarding his/her own health status and another about religiousness. There were further questions about COVID-19 infection or its suspicion in terms of the person's own and immediate environment, the severity of the perceived symptoms and the form of the necessary health care. As we were curious about how the nature of the pandemic (faster spread and more serious course of the disease than the previous one) and the availability of the vaccine or its absence influence mental phenomena, we complemented our questionnaire by two questions about being vaccinated and the willingness for vaccination, and additionally, two questions about the demand for mental support.

We used the Short Health Anxiety Inventory (SHAI) for the examination of health anxiety for both data recording, while the Religious Self-categorisation Scale (Tomka, 1998) was used for measuring religiousness.

The SHAI (Salkovskis et al., 2002) is an 18-item scale which measures health anxiety independently from physical health state. The items ask about worries related to health status, attention directed to physical happenings and the consequences of a potential illness. (Köteles et al., 2011) The health anxiety questionnaire is a reliable measuring tool (Crombach's alpha=0.83). The scale variables contain disease belief, tendency for a disease, fear, nervousness about a disease, physical consciousness, fears related to death and attitudes related to the others' and the own health. The questionnaire has two sub-scales: one is the perceived possibility of getting, becoming ill, the other is the perceived consequence of the disease (Perczel-Forintos, 2018).

One question measured the respondent's own religious practice: "Do you practice any religions, and if yes, how?" Answer could be given on a 6-level scale: "I am not religious", "I do not practice my religion", "I practice my religion on my own way", "Rarely, but I practice my religion in my church", I regularly practice my religion in my church", I do not want to answer". (Tomka, 1998)

We used IBM SPSS Statistics 20.0 program for data processing and analysis, and over descriptive statistical methods, we used correlation analysis, T-probe and chi-squared test.

## 3. Results

### *Demographics*

The mean age of the 528 persons participating *in the first phase of the research* (in the second wave of the pandemic) was 39.4±13.1 years. 44.7% of the respondents live in cities, 28.8% in towns and 26.1% live in villages. Most of them has higher education level (59.3%), 28.2% has high school final graduation, 7.3% has technical qualification, 20.7% are workmen and 2.5% has basic education. Most of the respondents has a regular job (62.1%), the rate of students (15.3%) and women raising infants (11.5%) is high. Pensioners (7.5%) and unemployed people (2.5%) also took part in the research. 45% of the unemployed people have lost their jobs

more than a year ago, 27.3% in the last year and 27.3% has become unemployed in the last 3 months. The majority has intellectual jobs (31.9%), 23.5% has other kind of intellectual job, and 23.7% works in health care. Most of them work in a subordinate position (69%), but 12.3% is self-employed, 10.9% is a middle manager, 3.9% is the rate of group leaders and 3.9% works as a senior manager.

16.7% of the asked people have undergone the COVID-19 infection, 37.9% of them are unsure about undergoing it. Most of the people having been infected (50.4%) had mild symptoms, while 47.8% suffered from medium strength symptoms. When we asked about the wider environment, they reported essentially more infections: the infection could have been detected in all the respondents' households. 22.7% of those living in one household had at least one member and 77.3% had more than one infected family members. The severity of the course of the infection was different: 32% judged it very mild, 60.9% said it was medium, 3.1% of them needed hospitalization, and the course of the infection was fatal in the environment of 3.5% of the respondents. When examining a much wider environment, we met greater dispersion: 17.5% said that there were not infected people among his/her wider family or friends, one infected person could be detected in case of 22.4%, and more relatives or friends were COVID-19 infected in the case of 60.1% of the respondents. In this group, mild symptoms were reported only in 21.3%, medium strength symptoms could be detected in 53.5%, 9.8% received hospital treatment, 2.1% received intensive care and 13.1% of the cases were fatal.

*At the second data recording (in the third wave),* the number of the respondents was 515, their mean age was 34.7±13.05 years (extent: 18-75 years).

49.6% of the respondents live in cities, 24.6% in towns and 25.8% live in villages. Most of them has higher education level (53%), 37.7% has high school final graduation, 6.3% has technical qualification, 2% are workmen and 0.8% has basic education. 60.9% of the respondents have regular job, 22.5% are students, 6.4% are child-raising women. 20.2% of the sample works in an intellectual job, 17.8% has other kind of intellectual job, 28.8% is healthcare worker. Most of them work in a subordinate position (75.8%), an additional 9.3% is self-employed, 6.2% is a middle manager, 5.2% works as team leader and 1.9% works as senior manager. Pensioners (3.5%) and unemployed people (3.3%) also took part in the research. 38.9% of the unemployed people have lost their jobs more than a year ago, 44.4% in the last year and further 16.7% has become unemployed in the last 3 months.

At the time of answering, 23.5% of the asked people have undergone the COVID-19 infection, 30.3% of them were unsure about undergoing it. Most of the people having been infected (45.1%) had mild symptoms, while 52.6% suffered from medium strength symptoms, 0.4% required hospitalization and 0.2% needed intensive care.

When we asked about the wider environment, they reported essentially more infections: the infection could have been detected in all the respondents' households. 37.1% of those living in one household had at least one member and 62.9% had more

than one infected family members. The severity of the course of the infection was different: 12.4% judged it very mild, 54.5% said it was medium, 14% of them needed hospitalization, and the course of the infection was fatal in the environment of 16.6% of the respondents. Examining the wider environment: 14.1% said that there were not infected people among his/her wider family or friends, one infected person could be detected in case of the environment of 14.5%, and more relatives or friends were COVID-19 infected in the case of 71.3% of the respondents. In this group, mild symptoms were reported only in 12.4%, medium strength symptoms could be detected in 54.5%, 14% received hospital treatment, 2.5% received intensive care and 16.6% of the cases were fatal.

At the time of answering, 45.8% of the sample had received a vaccine, 54.2% had not. 61.7% of the respondents had signed up 30.1% had not signed up, and 8.2% had not signed up, but they were planning to do so.

Finally, only 5.5% of the respondents have asked for mental support from a professional in the recent period, most of them, 94.5% have not asked this kind of help. At the same time, 38.2% answered that if they had the chance, they would ask for mental help, while 61.8% of them would not live with this opportunity.

***Health anxiety***

In case of health anxiety, only a minimal difference could be detected between the two data recording process (Table 1). At the third wave, we experienced the decrease of the anxiety level with a minimally higher dispersion compared to the second wave, while the pandemic was more intensive in the third wave, and the restrictions were stronger than in the previous wave.

| | *Second wave (Mean)* | *Third wave (Mean)* |
|---|---|---|
| *Health anxiety* | *33.84* | *33.43* |
| *SD* | *7.32* | *7.62* |

Table 1: Health anxiety

There was not significant difference in case of the genders (p>0.15) (Table 2), but men's anxiety level was higher than in women in data measured in the second wave. This rate turns at the third wave, since at this time, the health anxiety values of women in the sample are higher than men's values.

| *gender* | | *Second wave Health anxiety (Mean)* | *Third wave Health anxiety (Mean)* |
|---|---|---|---|
| *male* | *Mean* | *34.9583* | *32.7361* |
| *female* | *Mean* | *33.6163* | *33.5463* |

Table 2: Anxiety level by genders

If we examine the change in terms of the residence (Table 3), it can be observed that, however, the difference is not significant (p>0.217), but a tendency-like decrease can be experienced mainly in cities. The level of health anxiety is stronger in villages in the second wave, and the smallest decrease can also be seen there.

| *Residence* | *1. Health anxiety (Mean)* | *health anxiety (Mean)* |
|---|---|---|
| *city* | *33.9550* | *32.8500* |
| *town* | *33.7857* | *33.3254* |
| *village* | *34.2803* | *33.9848* |

Table 3: Anxiety level in terms of residence

In case of data measured in the third wave, health anxiety level was significantly higher in families (p<0.017) where there had been COVID-19 - infected person. This phenomenon could not be experienced in data of the second wave.

If the sub-dimensions of health anxiety are examined, the following changes can be observed (Table 4):

| | *Second wave (Mean)* | *Third wave (Mean)* |
|---|---|---|
| *Perceived possibility of becoming ill* | *26.1970* | *25.8754* |
| *Perceived consequence of becoming ill* | *7.6434* | *7.5573* |

Table 4: Sub-scales of health anxiety

The perceived possibility of becoming ill shows a significantly smaller decrease than in the case of perceived consequence. In both waves, the values of health anxiety are higher in people in subjectively satisfactory and bad health state.

The perceived possibility of becoming ill in case of own COVID infection occurred significantly in the second wave (p<0.007). The severity of COVID infections in the family also strongly occurs in the examined sub-dimensions, because the perceived consequence of the disease shows significant difference with the severity of the COVID infection in the family (p<0.008), so, more serious infections in the family increase the value of the sub-scale.

However, in the third wave, the subjective health status is determining at the values of both the perceived possibility of becoming ill (r= -0.436) and its consequence (r=-0,256) ((p<0.000002). So, the worse health status the person perceives, the higher the sub-scale values. The issue of religiousness is also determining, because religiousness is a determining factor (p=0.005) in case of the perceived consequences of the disease.

In terms of the residence, it can be observed that it is a tendency in both pandemic waves (p>0.18) that the values of the sub-scales are the highest in the villages (Table 5).

| | *Second wave* | | *Third wave* | |
|---|---|---|---|---|
| | *Perceived possibility of becoming ill* | *Perceived consequence of becoming ill* | *Perceived possibility of becoming ill* | *Perceived consequence of becoming ill* |
| *city* | *26.2900* | *7.4000* | *25.4350* | *7.4050* |
| *town* | *26.2566* | *7.6711* | *25.8095* | *7.5159* |
| *village* | *26.6014* | *7.7609* | *26.4318* | *7.5530* |

Table 5: Values of the health anxiety sub-scale in terms of the residence

The values of the sub-scales decreased in the third wave, but it could be observed that it was the highest in people living in villages and the decrease was the smallest here.

In terms of genders, no significant deviations can be found ($p>0.28$), but the sub-scale values of the perceived possibility of becoming ill were stronger in women in both waves (Table 6).

| | *Second wave* | | *Third wave* | |
|---|---|---|---|---|
| | *Perceived possibility of becoming ill* | *Perceived consequence of becoming ill* | *Perceived possibility of becoming ill* | *Perceived consequence of becoming ill* |
| *male* | *26.0357* | *7.7500* | *25.1528* | *7.5833* |
| *female* | *26.2161* | *7.6314* | *25.9932* | *7.5530* |

Table 6: Health anxiety sub-scale values in terms of genders

In the perceived consequence sub-scale, men's values were higher in the second wave, which correlation can be detected in the third wave as well, but less strongly.

***Vaccine***

At data recording of the third wave, 61.7% of the sample respondents had already registered for vaccination and 45.8% had already received vaccine. 35.8% of the registered people trust in getting the vaccine in a month, according to 22.7%, it will happen in 2-3 months, and 41.5% has no idea about the date. Although, there is not significant difference at the ages ($p>0.67$), but it occurs on a tendency level that the willingness for vaccination is stronger in younger, highly qualified people ($p<0.042$). When examining the willingness for vaccination, no correlations with health anxiety could be found ($r=0.024$).

***Healthcare professionals***

In the examined sample, the values of healthcare professionals show minimal deviation compared to the population (Table 7).

| | *Second wave* | | | *Third wave* | | |
|---|---|---|---|---|---|---|
| | *Perceived possibility of becoming ill* | *Perceived consequence of the disease* | *Health anxiety* | *Perceived possibility of becoming ill* | *Perceived consequence of the disease* | *Health anxiety* |
| *Mean* | *26.8136* | *8.1780* | *34.9915* | *25.6200* | *7.7533* | *33.3733* |

Table 7: Health anxiety values of healthcare professionals

In the second wave, both the healthcare professionals' health anxiety values and the sub-scale values are higher compared to the population, which values show strong decrease in the third wave.

In the third wave, the healthcare professionals' health anxiety values are minimally lower than the population's values. In case of the sub-scales, the values of the sub-scale called "Perceived consequences of the disease" are high than the population's mean.

In the third wave, the values of the sub-scale of perceived possibility of the disease significantly differ in case of the educational level of healthcare professionals ($p<0.036$). The higher the professional's educational level, the higher the sub-scale values. Health anxiety was highly influenced by the occurrence of the vaccine. In case of the Perceived consequences of the disease sub-scale, a medium strength correlation ($r=0.377$) can be experienced in case of registration for vaccination. The willingness for vaccination of healthcare professionals with higher qualification occurs more strongly ($p<0.043$). 37% of the healthcare professionals would like to get mental support in the third wave of the pandemic.

## IV. Discussion

Health anxiety is a quite common anxiety type, which is a natural reaction, if we perceive factors endangering our health. Everyone can experience this anxiety type during his/her lifetime, since it is natural to worry about our health. This phenomenon has got more attention nowadays in the uncertain, pandemic-affected socio-economic environment.

Based on the research, the anxiety level is not in connection with gender, age or socio-economic status, but the social and individual uncertainty caused by the pandemic has not emerged so strongly in these studies yet. During our research, we experienced that the level of anxiety in the pandemic period is clearly influenced by the information available for the population. So, the communication infrastructural channels, which function as an information resource in a certain region, have an essential role. That is why the decrease of the health anxiety level can be felt in the

third wave, when the pandemic situation is less unknown for the population, and they have much more information about the virus itself, the protection possibilities, and, not negligibly, hopeful health safety related to the vaccine in this period.

It also emerges from our examination that health anxiety is a process which goes under a continuous transformation in the pandemic situation. Globally, the anxiety level, even if not significantly, but decreases by the prolongation of the pandemic. We measured higher values in people living in villages, where the presence of individual communication information channels occurs presumably more strongly, and perceptions directed to health may be distorted more often.

Infection occurring in the family also influenced positively, so increased health anxiety level.

The anxiety level of healthcare workers shows an increased value compared to the population's value. This increase can be explained clearly by the closeness of the disease and the direct experiences of the effect and outcome of the disease. These values of our research correlate with other studies.

## V. Conclusion

The long-lasting CVID-19 pandemic has caused the general increase of the level of health anxiety globally, even if data measured in two waves of the pandemic in our research show subjective decrease. Studies performed in this topic warn for the characteristics of health anxiety related to COVID-19 and its negative consequences expected in the near future. Too high health anxiety level may influence harmfully the individuals' and communities' adaptive reaction for the pandemic, that is why the exploration and monitoring of its level and understanding the influencing factors have become important.

Health anxiety or worry for our health and watching anxiously unusual physical symptoms is adaptive, it is a psychological process and not a disease. Health anxiety has no cure, since it is a natural process, it is completely normal, and everyone experiences it sometimes in a life. Individuals may suffer from its harmful effects in different amount. Some of the problems come from that people been infected earlier start to observe these symptoms increasingly, they catastrophize their physical symptoms which can lead to panic attacks and further mental symptoms. Anxious people monitor the body's signals more intensively, and they tend to enlarge them that may cause intense anxiety. The stress-vulnerability model is valid in all long-lasting stress situations, so in the COVID-19 pandemic as well: if stress increases, symptoms of mental disorders against which the individual was more vulnerable occur or worsen. In this situation, economic difficulties caused by the pandemic, losing a job or the fear from that, durable isolation and loneliness are enough for this, since these are severe stress factors in their own as well. This can increase the fear from the disease, hospitalization and finally, from death.

The coexistence of the listed factors can cause health anxiety even in people who are basically not tend for it and strengthen the symptoms in people who are tend for it. Therefore, the number of people who need mental help has increased due to the pandemic.

So, learning stress management, conscious content consumption, and more reliable information is essential for everyone to prevent more severe anxiety. Therefore, it worth to raise the attention for the importance of psychoeducation.

This study is part of a complex study that also examines changes in perceived stress, well-being, aggression, and hope during the pandemic period in the affected region. The region has also lagged behind in COVID-19 vaccination, making a further wave of the epidemic likely to induce further research.

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# Fighting Infodemic Becomes Must After Covid-19 Pandemic's Onslaught on Truth, Knowledge

**Bora Erdem**

## Abstract

Due to the Coronavirus (COVID-19) pandemic, which has resulted in tens of thousands of deaths and hundreds of thousands of infected cases, the international community has been confronted with one of the most urgent health crises in recent decades. With the COVID-19 pandemic, we confronted a new phenomenon known as an "Infodemic" or "epidemic of misleading information" regarding COVID-19. Presently, a large amount of unsubstantiated material on various elements of the COVID-19 disease, disease control and prevention techniques and its effects is being distributed via social media, news agencies and television networks. Due to their accessibility, social networks are increasingly becoming an integral part of our lives. They provide avenues where anybody can convey their ideas and post information without impeding or regulating their publishing validation. As a consequence, it facilitates the spread of "Fake News," material that is deliberately false. Because of the amount of social media users and the volume of followers, fake social media news could have major adverse social repercussions. Misinformation and disinformation can have detrimental effects on people's mental and physical health, increase stigma, jeopardize valuable health gains, and result in poor adherence to public health measures, hence reducing their efficiency and jeopardizing their ability to manage the pandemic. Misinformation can result in death. Without trust and accurate information, diagnostic tests go unutilized, immunization campaigns (or initiatives to enhance effectiveness of vaccines) fall short of their goals, and the virus thrives. What's more, disinformation is creating a rift in public debate on COVID-19-related issues, intensifying hate speech, increasing the chances of conflict, violent acts, and violations of human rights, and jeopardizing long-term prospects for advancing social cohesion, human rights, and democracy.

**Keywords:** COVID-19, false news, misinformation, infodemic, eHealth

## Introduction

The Coronavirus (COVID-19) is the first global pandemic to extensively use social media and other forms of technology to keep people connected, informed, safe and

productive. Simultaneously, the technology we depend on to stay informed and connected is facilitating and magnifying an infodemic that is undermining the global response and jeopardizing pandemic-control measures.

A type of information tsunami accompanies every epidemic, but there will always be misinformation and rumours. This occurrence existed even in the Middle Ages. However, this phenomenon is amplified with social media and spreads quicker and wider, much like viruses that travel with individuals and spread further and faster. This has presented new challenges where timing is crucial because you have to be faster to fill the void. During an outbreak, what's at risk is ensuring that people do the proper thing to manage the disease or limit its impact. So, the purpose of the information is to make sure citizens are informed and to make sure they are informed to conduct themselves accordingly (Larson, 2020).

Some governments give counsel that contradicts World Health Organization (WHO), which confuses citizens. Is a social distance of one or two meters considered to be acceptable? Approximately how many days is self-isolation? Is wearing a mask or not a matter of personal choice? Mid-May, England permitted one person to visit, whereas Northern Ireland allowed six people gatherings but with some social distancing; In contrast, Belgium stated that four people were the limit. The guidelines are constantly changing as political leaders evaluate COVID-19's current state, and their choices' implications.

In social media conversations on COVID-19, immunity is a recurring issue. Discussions range from different strategies of establishing immunity to defending against COVID-19 to supposed remedies. COVID-19, its dissemination pattern, illness causes, and long-term implications are being revealed every day. The six months since the coronavirus was originally reported have seen substantial progress in the body of work accomplished, but it's not enough to quell the concerns, anxieties, and doubts.

Because vaccines and therapies for COVID-19 are not yet available, those advocating alternative treatment and prevention options are filling the void. During the 1918 'Spanish' flu pandemic, lozenges, laxatives, pine tar honey and snake oil were promoted as prevention and cure products. Today, boosting immunity in order to cure or prevent COVID-19 is a common mantra among many, with various remedies such as liquorice, 'antiviral herbs,' drinking hot water and lemon, or eating garlic, to colloidal silver (which is dangerous), being purported, and so on.

Directly challenging existing beliefs will not create a better understanding of immunity, which informs safer decisions. As a result of numerous studies, it has been shown that persuasive strategies tend to entrench rather than modify beliefs. Public education approaches that resonate with existing attitudes and sentiments are needed to increase public awareness of our immune systems and their functions.

Citizens today, more than ever, want to be in control of their health. The idea of strengthening your own immune system gives people a sense of being in control of

their health. To some extent, this is correct. Where necessary, eating healthy, vitamins, as well as exercise can go a long way in managing the severity of health conditions and diseases and save lives in some cases. What needs to be made clear is that nutrition, supplements, and yoga alone can't stop a bacteria or virus from infecting people (Larson, 2020). The community's involvement is critical in keeping the coronavirus (COVID-19) epidemic at bay. The propagation of this misinformation may lead to improper behavior and undermine the healthcare and government efforts to manage COVID-19, resulting in panic and in some cases xenophobia (Chong et al., 2020).

Over the previous few decades, the world of news media has seen a remarkable transformation. Digital sources have drastically extended the reach of social media, journalism, and public interaction. Local media websites, big newspapers, Facebook, Twitter, and Google have all become frequent places for individuals to check for news online. Smartphone notifications and mobile apps give the latest happenings to people across the world in real time. 93 percent of the American population stated they got their news from online sources in 2017 (Chong et al., 2020).

Among those surveyed, 36 percent said they got their online news via a news organization's app or website, 35 percent said they got their news from social media, and 20 percent said they got their news through a search engine; 15 percent cited an alert, text, or email from a news outlet, 9 percent cited other sources, and 7 percent cited family members (Owen, 2017).

**eHealth Literacy**

**Role of eHealth Literacy in Controlling the Infodemic**

Numerous opportunities to access real-time health-related information and misinformation arise as a result of the increasing usage of mobile devices. Public health officials must traverse a complex social environment to keep their health in check and employ proper preventative measures based on available knowledge during the current infodemic. Anxiety and uneasiness might be exacerbated by the sheer volume of COVID-19-related communications and information, creating significant challenges in promoting eHealth literacy.

The Ebola outbreak which took place in 2014 saw rumours on social media fuel anti-health-care worker sentiments as well as the ongoing anti-vaccine posts that appear to support debates around the safety of vaccines potentially lowered the rate of vaccination (Smith, 2017). These are well known examples of the negative implications of spreading deceptive news, and can be witnessed in the current pandemic (Oyeyemi et al., 2014).

When a COVID-19 vaccine becomes available, it is expected that anti-vaccination conspiracy theories will be flooded across social media and other digital networks, wreaking havoc on public health efforts to combat COVID-19.

It's critical to comprehend eHealth literacy's role in the COVID-19's outbreak control. While it's important to measure eHealth literacy in relation to infectious diseases using accurate techniques, it's even more critical that we look at the relationship between health-related disinformation and eHealth literacy and how it affects the public's decisions to take COVID-19-prevention measures like handwashing, practicing physical distance and wearing a mask.

As a result of COVID-19, focus on eHealth literacy evaluations and possible interventions must extend beyond functional health literacy (being able to receive applicable health information), the person, and the clinical care environment. In order to address disinformation about COVID-19 on social media, one solution is to improve health literacy among the general public and enhance community capacity through social involvement and dialogue.

To be sure, recent efforts by government agencies to work with social media platforms (WeChat, Weibo, Instagram and Google) to flag and fact-check false information have created opportunities for social support and collaborative learning for the general public in order to reinforce vital health literacy among the population. But additional studies are needed to determine ways in which critical health literacy may be improved at the community level.

The COVID-19 infodemic is infecting people faster than the actual virus in several locations, but health care professionals frequently overestimate the public's level of health literacy in dealing with health-related information.

Nurses are uniquely qualified to assist clients in understanding and utilizing health information to improve their health. Public understanding of information is a concern for all practitioners. According to the American Academy of Nursing's "universal precautions" for health literacy, clients' understanding of health-related information should always be validated (Loan et al., 2017).

Several factors need to be considered to successfully deliver eHealth. To begin, the healthcare system must have sufficient resources to provide services and appropriate information. To develop services and run current technology responsibly, service providers must have the appropriate skills. Patients also need a digitally connected home. Other than being conversant with digital technology, patients need the skills and drive to actively seek, find and fully absorb healthcare information as well as apply what they learn to address and contribute to solving a health issue. – this is referred to as eHealth literacy (Brors et al., 2021).

The eHealth Literacy Lily model organizes six key literacies into two categories: analytical (information literacy, media literacy and traditional literacy and numeracy) and context-specific (health literacy, computer literacy and science literacy). These six literacy types, when combined, form the foundational skills needed to improve patients' eHealth experiences.

### Analytical Literacy

Analytical literacy skills are necessary for participation in daily informational life. During isolation and quarantine months, when citizens need to research and analyse support from their regular care via the internet to meet their needs, this is especially important. Patients may need to order medications from online pharmacies or food and supplies from an online supermarket, for example.

### Context-specific Literacy

Problem types, specific issues and contexts are the focus of context-specific literacy skills. Many people face quarantine and isolation, which presents several challenges due to the current COVID-19 outbreak. Because of the crisis, people have been physically and socially estranged from healthcare providers, yet healthcare is being offered in a new environment using technology.

As a result, this may be difficult for those who have never used a computer, are unfamiliar with scientific terms, or have trouble adhering to self-care instructions. The COVID-19 outbreak showed us that eHealth literacy is a process-oriented skill that evolves when new technologies are adopted and settings such as individual, cultural, and environmental factors change. Patients' health status, educational background, health issues during their eHealth encounter, the technologies used and motivation for seeking information all influence eHealth literacy (Brors et al., 2021)

## Measures taken towards the infodemic

### Prebunking

Several methods of countering misinformation are supported by psychological research. One method is to debunk false information after its spread. However, inoculating citizens against fake news before being exposed is far more effective—a strategy known as prebunking. The inoculation theory, created in the 1960s to promote preemptive resistance to unwanted persuasion attempts, pre-bunking is founded on inoculation theory (Linden & Roozenbeek, 2021). 'Mental antibodies' are said to be generated when people are exposed to examples of common strategies used in manufacturing fake news, in the same way as a weak dosage of the virus triggers antibodies to prevent future infection. Many people being inoculated against the "virus" of information will prevent it from spreading (Linden & Roozenbeek, 2021).

A free experimental online game, Bad News, was created by Linden and Roozenbeek in association with the Dutch media literacy organization Drog to highlight this point. While learning six basic disinformation methods (including emotion, conspiracy theories, and polarization), players adopt a fake news tycoons' persona who aims to accumulate as many followers as possible through the active distribution of fake news.

This game functions as a "vaccine" against fake news by allowing players to actively reason through the process of spreading false information before being presented

with the "real" copy found on the web. They tested approximately 15,000 participants pre and post exposed to true and false news themes, which included prevalent misleading techniques as part of previously unseen content (Linden & Roozenbeek, 2021). The findings were not long ago featured in Palgrave Communications, and interpreted the intervention as successful. After playing, participants significantly reduced their trust in fake (but not real) headlines. The sample wasn't representative, and the intervention wasn't randomized, which is important to keep in mind. However, randomized controlled trials have begun being conducted using the game. The results reflect the intervention's robustness. It also proved to be effective outside of academia. For instance, they set out to create an intervention that would pique the interest of a large portion of the population and entice them to participate voluntarily. As a result, more than 500,000 people have played the game so far (Linden & Roozenbeek, 2021). Design firms, the Behavioral Insights Team as well as gaming blogs have all nominated the game for awards and given excellent feedback

Collaborative efforts with the UK Foreign Office have resulted in the game being translated into 13 different languages, including Serbian, Swedish, Esperanto, Greek, Polish, Czech, German, and Dutch (Linden & Roozenbeek, 2021). These findings emphasize the importance of using this strategy in other avenues being affected by misinformation. The perceived reliability of deceptive content across all languages was reduced significantly, which indicates that the ability of participants to spot misinformation is notably improved. Relevant demographic factors such as political ideology, education level, gender, and age significantly influenced the inoculation effect.

As a stand-alone strategy, "prebunking" is insufficient. In the post-truth era, it is an excellent first line of defense inside a multi-layered anti-misinformation strategy, which integrates behavioral science insights with computer science, public policy, and education ideas. Similar large-scale "vaccination programs" could be developed against misinformation by governments, social media companies and educational institutions. Such strategies can be adopted directly in education programs, customized for social media use, or other fields where online misinformation poses a threat.

Instead of just using debunking as a means of combating the online spread of misinformation, (social media) enterprises, educational and governmental institutions should also consider prebunking (inoculation).

**Encourage People to Question Veracity of Claims**

Another way to combat misinformation is by encouraging people to question the veracity of the claims they come across. Pennycook and his colleagues discovered that simple accuracy nudges improved participants' ability to distinguish between real and fake news in a COVID-19 misinformation test. Participants were shown a series of headlines, some false, some true, and were asked to rate how likely they were to

share each item. Compared to participants in the control group, those in the experimental condition shared more accurate news content. (Pennycook et al., 2021).

**Implementing the Use of Sentiment Analysis (SA)**

Sentiment analysis identifies positive or negative attitudes within text. Companies often use it to understand customers, measure the brand's reputation, and detect sentiment in social data. Since people are more open than ever to express their opinions and feelings, sentiment analysis is a helpful tool for monitoring and understanding this feeling. Automatically analysing information such as social media conversations and opinions in survey answers enables brands to identify what makes their customers frustrated or happy to customize services and products to satisfy customers' needs.

This concept can be applied in efforts aimed towards taking the infodemic under control. Understanding the feeling behind a piece of information can help determine whether it's true or false. Computer technologies offer a great opportunity to fight outbreaks of infectious diseases and play an important role in social media sentimental analyses in particular, because of their significant role in the analysis of sentiments among the population. Various research articles have shown that if professionals considered social media data, many epidemics and pandemics could be monitored quickly. Sentiment studies are therefore crucial based on recent developments in the research of pandemics such as COVID-19 which remains a controversial topic on social media worldwide (Alamoodi et al., 2020)

**Types of Sentiment Analysis**

SA models concentrate not only on polarity (negative, positive or neutral) they also focus on emotions and feelings (sad, happy, angry), urgency (not urgent or very urgent), and even intentions (not interested or interested). Category definition and customization are possible based on your sentiment analysis requirements. Some popular categories of SA are listed below:

**Fine-grained SA**

There are situations where polarity accuracy is critical for analysing a piece of information. In such a case, expanding your subgroups to feature:

Very Negative

Negative

Neutral

Positive

Very Positive

This is known as fine-grained sentiment analysis, and is great for translating 5-star ratings in reviews, for instance:

Five stars for Very Positive

One star for Very Negative

**Emotion Detection**

This form of SA seeks to identify sadness, anger, happiness and frustration. Most emotion detection systems rely on lexicons (lists of phrases and words and what emotions they depict) or sophisticated ML algorithms.

One disadvantage of using lexicons is that different individuals express their emotions in a variety of ways. Certain words and phrases commonly used to express anger, such as bad or kill (your customer service is killing me or this product is bad), can also express happiness (e.g., you are killing it, or this is badass).

**Aspect-based Sentiment Analysis**

While evaluating sentiments in texts, such as social media posts reviews, you will typically want to point out which specific aspects were mentioned in a positive, negative, or neutral way. This is where aspect-based sentiment analysis comes in.

**Multilingual Sentiment Analysis**

Multilingual sentiment classification may sometimes prove to be challenging. It necessitates a significant amount of resources and preprocessing. Most of these resources can be found online (for example, sentiment lexicons). In contrast, others must be created (for example, noise detection algorithms or translated corpora), but you need to know how to code if you were to use them.

Alternatively, you could automatically use MonkeyLearn's language classifier to detect the language in texts, then train a specially designed sentiment analysis model to group texts in your preferred language.

**How it can be used**

Sentiment Analysis (SA) is responsible for designing and implementing techniques, methods and models to understand whether a piece of information deals with subjective or objective information and or determining whether it is expressed in a neutral, negative or positive fashion and whether it is expressed weakly or strongly. Sentiment Analysis (SA) , a branch of NLP (Natural Language Processing) is sometimes referred to as Opinion Mining because a large portion of the subjective content shared by users on social media platforms are mere opinions (on chats, message boards, forums, review sites, and so on).

In fake news, the expression of sentiment is very important. Social media users often engage with posts when they think that content is exciting, but they do not feel they have no control over it. When users feel more in control, they tend to share a post. Sentiment-related behavior is sufficient to distinguish between human and social bot accounts by combining different sentiment variables. Attention-grabbing headlines

and emotional engagement are key to increasing the distribution of information. Its no coincidence that clickbait is often related with the dissemination of misleading information, since many people who are exposed to bogus news don't read past the headlines. Consequently, SA gives essential information about the substance of a piece of information to assess if it is genuine or should be called fake news (Alonso et al., 2021).

Detecting bogus news falls into two main categories, according to Conroy. Language-based approaches are used to gather and analyze the content of misleading messages in order to link language patterns (word usage, rhetorical linkages between linguistic elements, semantic similarities, syntactic and ngrams constructions) with manipulation in the first approach. As for the second, it was about network-based deception measures using network information such as structured knowledge network queries or message metadata. To detect fake reviews, SA is regarded to be an effective tool not so much for the detection of false texts as it is for detecting false negative reviewers who exaggerated the emotions they were attempting to express (Conroy et al., 2016).

According to Shu et al. fake news has psychological and sociological foundations, as well as models and attributes employed by detecting systems aimed at addressing this phenomenon, taking into account both news and social context models and features, which can rely on user networks, independent users, or posts. They believed sentiment analysis must be used to determine post-based features. People are open to expressing their opinions or emotions about fake news via posts on social platforms, like sensational or skeptical reactions. The topic was later on revisited by investigating weak social supervision for spam detection, concluding that user comments linked to original news content are useful for detecting deceitful information and explaining prediction results. As a result, they hypothesized that machine-generated content produced by effective deep generative models is a potential type of fake news which is readable, smooth, and appealing In terms of sentiment analysis, it was believed that opposing attitudes between news spreaders could be a symptom of fake news (Shu & Sliva, 2021).

**Crowdsourcing**

Crowdsourcing enlists the knowledge of many viewers or readers to identify potential flaws in news coverage and can effectively combat fake news. A great example is The Guardian's effort to use crowdsourcing to evaluate 450,000 documents concerning the United Kingdom’s Parliament member expenses. It received the documents but was short on manpower to assess their newsworthiness quickly.

When the newspaper realized this, it set up a public website that allowed users to search for documents and group them in four categories: interesting but well-known, dull, interesting or research this. A vast audience can be reached through digital platforms. For example, During the first 80 hours, the Guardian attracted 20,000 users who reviewed 170,000 papers. In addition, the participants helped the newspaper

determine which records were the most troubling, necessitating more study and publicity in the media (West, 2021).

**Intentional Actions by the News Industry**

Press organizations should be pushed to continue to prioritize high-quality coverage to builds trust and attracts new readers. Over the last few years, several news organizations have seen a rise in viewership as well as readership, which has helped placed them on a more solid financial foundation. However, public trust in news spread by the media has plummeted, jeopardizing journalists' ability to hold leaders accountable and report the news. During this period of significant disorder and chaos, the world requires a viable and strong information and news outlet which keeps citizens in the know about long-term trends and current events.

News organizations must expose falsified news and disinformation while not legitimizing it. This can be attained by depending on in-house experts and established fact-checkers. Users can learn about news channels that are designed to mislead by using non-profit firms like Snopes, and Politifact, which assess statements made by leaders and describe them in detail. Candidates' evaluations and election campaigns in the United States and worldwide increasingly rely on these sources of information.

According to Professor Brendan Nyhan's research, categorizing Facebook posts as "disputed" minimizes the number of consumers who actually believe the false information by 10%. Furthermore, Melissa Zimdars, a media and communication professor of Merrimack College, grouped 140 online platforms which employ " dubious or decontextualized information and distorted headlines. This allows people to track down those who spread false information (West, 2021).

**Government Actions**

Independent, professional journalism is one of the things governments can do to improve the quality of journalism. For the public to make sense of complex changes and keep up with continuously changing political, economical, and social events, they rely on reporters. These "mega changes" have caused bewilderment, worry, and wrath in many locations. We urgently need a reliable Fourth Estate that is independent and not subservient to official authority in these times of turmoil (West, 2021).

Governments must avoid restricting the ability of the news media to report on events. These activities restrict freedom of expression and make it difficult for journalists to report on political developments. The American Government could perhaps serve as a model for other countries. As a result of American governments censoring or controlling the news media, other nations are following suit. Governments should desist from restricting content and holding digital platforms liable for misinformation. As a result, some people may be hesitant to communicate their political opinions for fear of being classified as fake news. We could unwittingly

encourage authoritarian governments to suppress free expression by adopting unduly strict regulations (West, 2021).

Governments should also make improving news literacy a major priority in terms of funding. Particularly for those who are using the internet for the first time, This is the case because it is difficult for them to differentiate between true and false news, these individuals must learn to question news outlets instead of taking everything they read on online networking sites or digitized news sites at face value. A better understanding of information published on the internet is crucial as we head toward digital immersion. Accordingly, nonprofit groups, educational institutions, corporations, and journalists should collaborate to foster news literacy.

Education is particularly important for children and teenagers. Third-party assessments are important to readers who are still young, according to findings by Benjamin Bowyer and Joseph Kahne. However, the impact is limited. Inaccurate statements reduced reader persuasion in comparison to adhering to their former policy beliefs. People were less likely to change their minds if they had previously agreed with the statement. (Khane & Bowyer, 2021).

**Strengthen Online Accountability**

Increasing online accountability by enforcing the use of real names and cracking down on false news sources is a great step towards controlling the infodemic. Organizations can accomplish this using "real-name registration," which requires internet users to indicate their true identity on hosting platforms, making it much easier to hold people accountable for their. People tend to hide behind an alias when making false comments or engaging in unlawful activity. This applies to misinformation and fake news since people are more likely to engage in such activity in the event that they believe their acts will stay private and not made public. As the late, great Louis Brandeis famously said, “sunshine is perhaps the best of disinfectants.” ("OTHER PEOPLE'S MONEY - CHAPTER V — Louis D. Brandeis School of Law Library," 2021). It aids in keeping people accountable and honest in their public actions.

Using a social media account with a fake name is an exception for people living under dictatorship.

**How the Public Can Protect Itself**

People can safeguard themselves from misinformation by following a diverse group of people and points of view. Depending on a limited group of similar news outlets affects people's access to information and increases their vulnerability to being deceived. While this technique isn’t fool proof, it exposes a reader to diverse and well-thought viewpoints.

As a reader and viewer, you ought to be doubtful of news outlets in the online world. A significant number of online sites turn to deceptive and exaggerated news in order

to increase clicks. They highlight the controversial or the eye-catching, even though the news hook is misleading. Consumers of news must be cautious and understand that not everything they read in the media is true and that a significant number of media outlets intentionally spread information which is false. A top priority is studying ways of evaluating news outlets in order to defend oneself from being supplied with misleading information (West, 2021).

## Conclusion

As a profession, journalism is constantly evolving. Due to the advent of new digital platforms, journalists now have access to innovative communication methods and a wider global audience than ever before. Conversely, hoaxes and disinformation (collectively called "fake news") propagate and impact how people view everyday events. Public faith in traditional media has dropped because of the expansion of cable news and talk radio, citizen journalism, and foreign players.

An important research problem is determining how people avert or seek information and how that affects their behavior, especially when the news cycle, which is dominated by the self regulated diffusion of information, affects how information is perceived and reported on.

Democracies are particularly vulnerable to fake news and sophisticated disinformation efforts, and there is rising discussion about how to best tackle these concerns without discrediting digital medias' benefits. To sustain a democratic system, consumers, corporations, and governments must work together to overcome these difficulties. It is the responsibility of the government to encourage citizens to read the news and to promote a robust, professional media in their areas. In order to build public trust, the news industry must produce high-quality journalism that corrects misinformation and fake news without legitimizing them

False news profiteers should be penalized, and online accountability should be improved by companies in the technology sector. Educational institutions should place a high premium on educating individuals about news literacy. Last but not least, people should read and watch a variety of news sources and be cautious of the stuff they are exposed to.

In May 2020 during the World Health Assembly, Resolution WHA73.1 was passed by WHO Member States on the COVID-19 response. It recognizes that to take the infodemic under control is a vital aspect of managing the coronavirus pandemic. The resolution encourages Member States to continue providing accurate COVID-19 content, to take steps to combat misinformation and disinformation, and to use digital technologies throughout the response. It also urges international organizations to combat disinformation and misinformation in the digital space, work to put a stop to harmful cyber activities jeopardizing health response, and facilitate the public dissemination of science-based data (WHO, 2020)

In response to the infodemic, civil society organizations and the UN system are pooling their collective knowledge and expertise. Simultaneously, as COVID-19 continues to cause anxiety and uncertainty, urgent action is needed to manage the infodemic, as well as collaborative efforts among civil society, multilateral organizations, states and all other players with a clear and active role in combating misinformation

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# Role of Arterial Hypertension and Diabetes Mellitus in Hemodialysis Patients with Sensorineural Hearing Loss

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## Abstract

Cases of chronic kidney disease (CKD) patients have increased significantly in the past few years. The main causes of chronic kidney disease are arterial hypertension and diabetes mellitus. **The aim** of this study is to identify arterial hypertension as one of the causes of neurosensorial hearing loss in patients under hemodialysis treatment. **Methodology**: This is a transversal study. The study population is 65 patients who are undergoing hemodialysis treatment at the American Hospital during the years 2015-2016. All collected data were calculated with SPSS program. Pearson R correlation, $\chi^2$ test, and ANOVA test were used to analyze the sample. **Results**: In this study were included 65 patients where 27 are from 2015 and 38 from 2016. 32.3% of patients were female and 67.7% male. Age min 32 years and max 83 years, mean = 62.69 years, DEV Std ± 11.32 years. In our study 81.5% of patients had problems with sensorineural hearing loss of varying degrees, ranging from mild sensorineural hearing loss 15.4%, moderate sensorineural hearing loss 50.8%, severe sensorineural hearing loss 9.2% and profound sensorineural hearing loss 6.2%. **Conclusion:** Hemodialysis patients with arterial hypertension are more likely to have sensorineural hearing loss than hemodialysis patients without hypertension. The presence or absence of DM in patients undergoing dialysis does not affect hearing problems.

**Keywords:** hearing loss, hemodialysis, neurosensorial, arterial hypertension

## Introduction

Hearing impairment is very common in end stage renal disease patients. Sensorineural hearing loss is much more common in this group of patients than

conductive hearing loss.(1) Literature data report that 20–87% of these patients have sensorineural hearing loss.(2)

Possible mechanisms of sensorineural hearing loss (SNHL) associated with renal failure and hemodialysis are controversial. Possible mechanisms include a shared antigenicity between the kidney and the inner ear, osmotic alteration caused by hemodialysis, and the ototoxic effect of diuretics.(3)

Hearing loss is a common finding in patients with chronic renal failure, and deafness may occur during the course of hemodialysis. Uremia, ototoxins, axonal uremic neuropathy, anemia, and toxic degradation products from cellulose acetate dialyzer membranes are all possible etiologic factors. Anemia seems to be an important factor responsible for hearing disorders in patients with end-stage renal failure.(5) Arterial hypertension and Diabetes Mellitus are a probable cause of hearing impairment and treatment of anemia with erythropoietin administration seemed to be a possible preventing factor.(6)

In general, the frequency of hearing impairment in chronic kidney disease is connected with age and gender, and with associated disorders such as hypertension and diabetes mellitus. Hearing loss included hypertension and DM type-2, and hypercholesterolemia. Those factors affect the inner ear blood flow which directly causing impairment of oxygen and nutrient transport to the cochlear cells and indirectly on auditory nerve degeneration. Chronic arterial hypertension causes nephrosclerosis and the longer the hypertension the more severe glomerular injury and tubular atrophy that eventually leads to renal failure. Diabetes mellitus is a common systemic metabolic disease, associated with multiple macro- and microvascular complications, including thickening of the basal membrane of the stria vascularis capillaries on the lateral wall of the cochlea and other microvascular and neuropathic changes that could induce hearing loss. DM usually is associated with the development of bilateral hearing loss.(7)

With progression in the stage of chronic kidney disease, the hearing loss also increased indicating a possible link between the two. We also noted that the hearing loss increased with the increasing age.(8)

## Methodology

This is a transversal study. In this study were included 65 patients where 27 are from 2015 and 38 from 2016. 32.3% of patients were female and 67.7% male. Age min 32 years and max 83 years, mean = 62.69 years, DEV Std ± 11.32 years. The patients were in end stage of renal disease and were treated with hemodialysis, three times a week, for 4–4.5 hours, using capillary dialyzers made of cellulose diacetate or polysulphone, of the surface area of 1.5–2.2 m2, of predominantly low permeability, sterilized by g-irradiation or ethylene oxide, with common blood (250–300 mL/min) and dialysate flow (500 mL/min). Water for dialysis was prepared by reverse osmosis, and conductivity of below 10 μS/cm3 was ensured. Exclusion criteria were history of

exposure to noise, Alport's syndrome and those with conductive and/or mixed hearing loss confirmed by pure tone audiometry. The patients underwent examination by the otorhinolaryngologist which was familiar with the study.HT was measured for air and bone conductivity, for both ears, for frequencies of 125,250, 500, 1000, 2000,3000, 4000, 6000 and 8000 Hz.

We were based on World Health Organization Grades of Hearing impairment (WHO 2008) for the classification of hearing loss in hemodialysis patients.

| Grade of impairment* | Corresponding audiometric ISO value** | Performance | Recommendations |
|---|---|---|---|
| 0 - No impairment | 25 dB or better (better ear) | No or very slight hearing problems. Able to hear whispers. | |
| 1 - Slight impairment | 26-40 dB (better ear) | Able to hear and repeat words spoken in normal voice at 1 metre. | Counselling. Hearing aids may be needed. |
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| 3 - Severe impairment | 61-80 dB (better ear) | Able to hear some words when shouted into better ear. | Hearing aids needed. If no hearing aids available, lip-reading and signing should be taught. |
| 4 - Profound impairment including deafness | 81 dB or greater (better ear) | Unable to hear and understand even a shouted voice. | Hearing aids may help understanding words. Additional rehabilitation needed. Lip-reading and sometimes signing essential. |

Table 1. World Health Organization Grades of Hearing impairment (WHO 2008)

**Result and Discussion**

In this study

65 patients

31% of patients were female and 69% male.

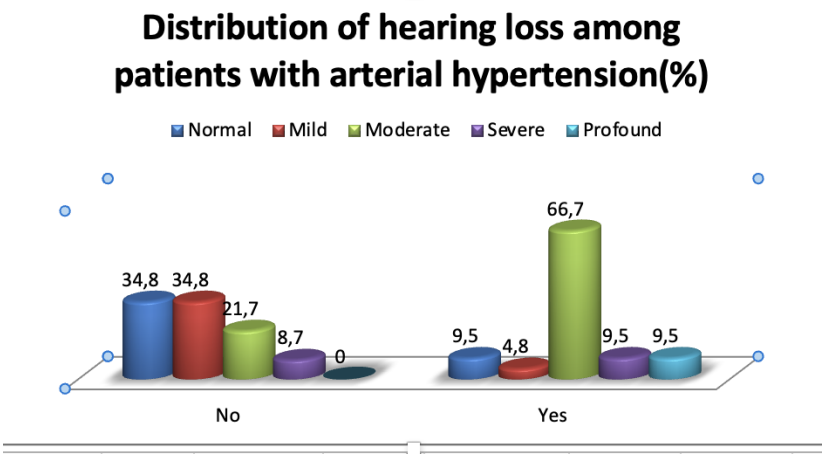
31% were 56-65 years old, 24% were 66-75 years old, 21% were 45-55 years old and 17% were over 75 years old, STDEV ±16.0, min 32 years old, max 83 years old, mean = 62.3 years old.

| Arterial Hypertension | Number of patients | (%) |
|---|---|---|
| No | 23 | 35.4 |
| Yes | 42 | 64.6 |
| Total | 65 | 100.0 |

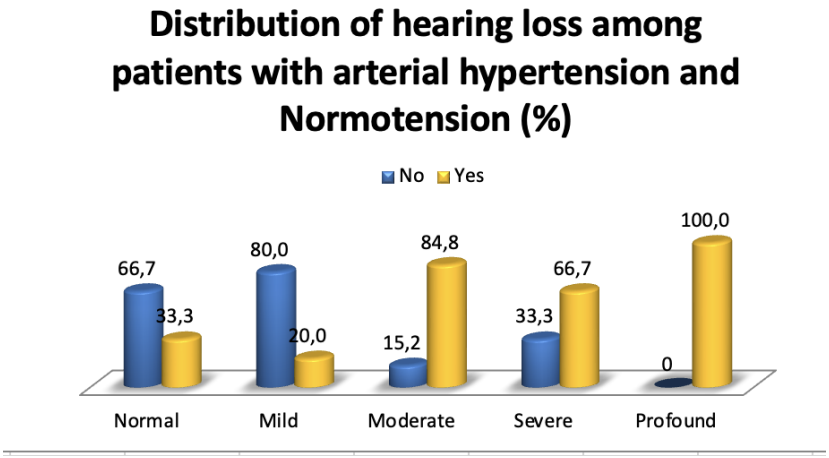
Table 2. The distribution of patients based on arterial hypertension

From the applied tests there is statistically important connection between presence of arterial hypertension and hearing loss in hemodialysis patients. There is a positive connection between these two variables. Fig 1, $\chi^2$= 21.952, p<0.001; Pearson's R=0.45. p<0.001 We can say patients in hemodialysis with arterial hypertension have higher possibility in having sensorineural hearing loss of different degrees.

66.7% hypertensive patients in hemodialysis have moderate sensorineural hearing loss. From the patients with sensorineural hearing loss 84.8 patients have arterial hypertension (Graf 1). From the patients with severe sensorineural hearing loss 66.7% have arterial hypertension and all patients (100%) with profound sensorineural hearing loss have arterial hypertension (Graf 2).



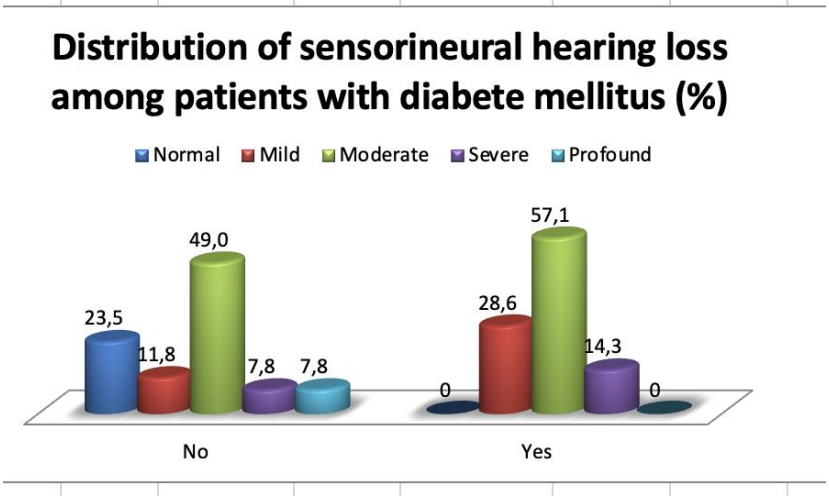

Graphic 1: Distribution of hearing loss among hypertensive patients and normotensive patients



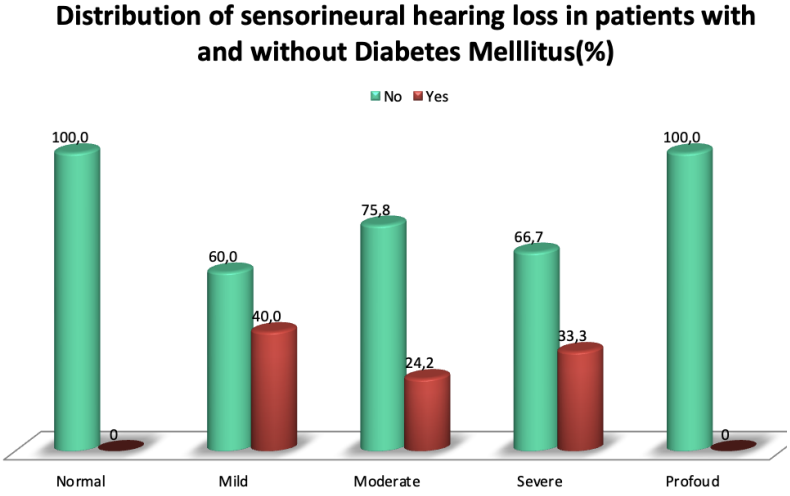

Graphic 2: Distribution of sensorineural hearing loss among patients with arterial hypertension and among patients with normal arterial tension

In our study 23.5 of patients without diabetes mellitus have normal hearing. 11.8% have mild sensorineural hearing loss, 49.0% have moderate sensorineural hearing loss, 7.8% have severe sensorineural hearing loss and 7.8 have profound sensorineural hearing loss.

In the group of patients with diabetes mellitus there are no patients with normal hearing, 28.8% of patients have mild sensorineural hearing loss, 57.1% of patients have moderate sensorineural hearing loss, 14.3% of patients have severe sensorineural hearing loss and none has profound hearing loss.




Graphic 3. Distribution of sensorineural hearing loss among patients with diabetes mellitus



Graphic 4. Distribution of sensorineural hearing in patients with and without diabetes mellitus

Based on the presence of diabetes mellitus in connection with problems with hearing there is none with diabetes mellitus and normal hearing, 40% of patients with diabetes have mild sensorineural hearing loss, 24.2% of patients have moderate sensorineural hearing loss, 33.3% have severe sensorineural hearing loss and none have profound sensorineural hearing loss. Based on these results the presence or not of diabetes mellitus in patients that are under hemodialysis treatment does not affect in the hearing of these patients. On the other side there is a positive connection statistically not significant between these two variables.

On the study of Lin et al. 2016 the results suggested an important connection between chronic kidney disease and the increased risk for sudden sensorineural hearing loss. Comorbidity of diabetes in the patients with kidney failure may be connected with increased risk for sudden sensorineural hearing loss especially in patients over 35 years old.(9)

In the study of Kohansall et al., 2020, arterial hypertension and diabetes mellites are risk factors connected in general in the hemodialysis patients with hearing loss without connection between comorbidity. And sensorineural hearing loss in the patients in hemodialysis.(10) This results about the role of diabetes mellites in hearing loss is in accordance with the results of our study. Meanwhile about the role of arterial hypertension in hearing loss of hemodialysis patients the results are not in accordance where in our study there is s positive connection statistically very significant between arterial hypertension and sensorineural hearing loss in hemodialysis patients.

In the study of Meena et al. 2012 also is supported the idea that arterial hypertension, damage of electrolyte balance and proteinuria are factors that have an important role in the worsening of sensorineural hearing loss in the patients in hemodialysis. Hearing loss is becoming more evident because the patients are living longer because of improvements of lifestyle in the patients with chronic kidney failure.

Also, in the study of Meena et al. 2012 results are in accordance with our study where arterial hypertension has a significant role in sensorineural hearing loss of hemodialysis patients. In this study all the patients with sensorineural hearing loss had systolic arterial hypertension over 160 mmHg.(11)

Based on the study of Purnami et al., hearing loss happened in the patients with arterial hypertension accompanied with diabetes mellitus type 2 (45%). Arterial hypertension causes changes in the structure of arterioles in the body, meanwhile diabetes mellitus causes microangiopathy in cochlea causing atrophy and reduction of hairy cells.(7)

## Conclusions

Sensorineural hearing loss is very common in hemodialysis patients. Hemodialysis patients with arterial hypertension are more likely to have sensorineural hearing loss than hemodialysis patients without hypertension. The presence or absence of DM in patients undergoing dialysis does not affect hearing problems.

## Acknowledgments

We would like to thank the patients for their collaboration.

## Conflict of Interest

The authors declare that they have no conflicts of interest.

## Author Contributions

Emirjona Vajushi followed these patients, drafted and revised this manuscript.

## Ethics Approval

An Ethics Approval Statement was not required for this report.

## Animal Rights

This article does not contain any studies with human or animal subjects performed by the any of the authors.

## Data Availabilty Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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# Sensorineural Hearing Loss as a Common Finding in Chronic Kidney Failure Patients Undergoing Hemodialysis

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## Abstract

**Background:** Chronic renal failure affects all organ systems. Senses are not exception and hearing impairment in this group of patients is very common, particularly sensorineural hearing loss (SNHL). **The aim** of this study is to put in evidence the situation of sensorineural hearing in hemodialysis patients that are presented at our department. **Methodology:** This is a transversal study. In this study were included 65 patients.21 (32.3%) female patients and 44 (67.7%) male patients Study was performed in the American Hospital 2 of Tirana during years 2015-2016. 27 (41.5%) patients during 2015 and 38 (58.5 %) patients during 2016. **Results:** 81.5 % of patients under hemodialysis had sensorineural hearing loss. 18.5 % of patients under hemodialysis had normal hearing. 15.4% of patients had mild sensorineural hearing loss, 50.8% of patients had moderate sensorineural hearing loss, 9.2 % had severe sensorineural hearing loss and 6.2% of patients had profound hearing loss. Hearing loss was mostly in high frequencies but without a specific pattern. All patients with sensorineural hearing loss (100%) had two sides damage of hearing. **Conclusions**: Sensorineural hearing loss is very common in hemodialysis patients. The hearing loss affects more the high frequencies. In the patient care of hemodialysis patients should be included the routine hearing monitoring test.

**Keywords:** sensorineural hearing loss, hemodialysis

## Introduction

Hearing impairment is very common in end stage renal disease patients. Sensorineural hearing loss is much more common in this group of patients than

conductive hearing loss.(1) Literature data report that 20–87% of these patients have sensorineural hearing loss.(2)

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Hearing loss is a common finding in patients with chronic renal failure and deafness may occur during the course of hemodialysis. Uremia, ototoxins, axonal uremic neuropathy, anemia, and toxic degradation products from cellulose acetate dialyzer membranes are all possible etiologic factors. Anemia seems to be an important factor responsible for hearing disorders in patients with end-stage renal failure. (5)

Diabetes Mellitus is a probable cause of hearing impairment and treatment of anemia with erythro-poetin administration seemed to be a possible preventing factor.(6)

Sensorineural hearing loss could occur in chronic kidney disease patients undergoing hemodialysis. In general, the frequency of hearing impairment in chronic kidney disease is connected with age and gender, and with associated disorders such as hypertension and diabetes mellitus. Hearing loss included hypertension and DM type-2, and hypercholesterolemia. Those factors affect the inner ear blood flow which directly causes impairment of oxygen and nutrient transport to the cochlear cells and indirectly on auditory nerve degeneration. Chronic hypertension causes nephrosclerosis and the longer the hypertension the more severe glomerular injury and tubular atrophy that eventually leads to renal failure. Diabetes mellitus is a common systemic metabolic disease, associated with multiple macro- and microvascular complications, including thickening of the basal membrane of the stria vascularis capillaries on the lateral wall of the cochlea and other microvascular and neuropathic changes that could induce hearing loss. DM usually is associated with the development of bilateral hearing loss. (7)

With progression in the stage of chronic kidney disease, the hearing loss also increased indicating a possible link between the two. We also noted that the hearing loss increased with the increasing age.(8)

## Methodology

The study included 65 patients in end stage renal disease treated with hemodialysis, three times a week, for 4–4.5 hours, using capillary dialyzers made of cellulose diacetate or polysulphone, of the surface area of 1.5–2.2 m2, of predominantly low permeability, sterilized by g-irradiation or ethylene oxide, with common blood (250–300 mL/min) and dialysate flow (500 mL/min). Water for dialysis was prepared by reverse osmosis, and conductivity of below 10 μS/cm3 was ensured. Exclusion criteria were history of exposure to noise, Alport's syndrome and those with conductive and/or mixed hearing loss confirmed by pure tone audiometry. The patients underwent examination by the otorhinolaryngologist which was familiar

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Table 1. World Health Organization Grades of Hearing impairment (WHO 2008)

**Results and Discussion**

In this study were included 65 patients. 21 (32.3%) female patients and 44 (67.7%) male patients Study was realized in the American Hospital 2 of Tirana during years 2015-2016. 27 (41.5%) patients during 2015 and 38 (58.5 %) patients during 2016.

81.5 % of patients under hemodialysis had sensorineural hearing loss.

18.5 % of patients under hemodialysis had normal hearing.

15.4% of patients had mild sensorineural hearing loss, 50.8% of patients had moderate sensorineural hearing loss, 9.2 % has severe sensorineural hearing loss and 6.2% of patients had profound hearing loss.

Hearing loss was mostly in high frequencies but without a specific pattern.

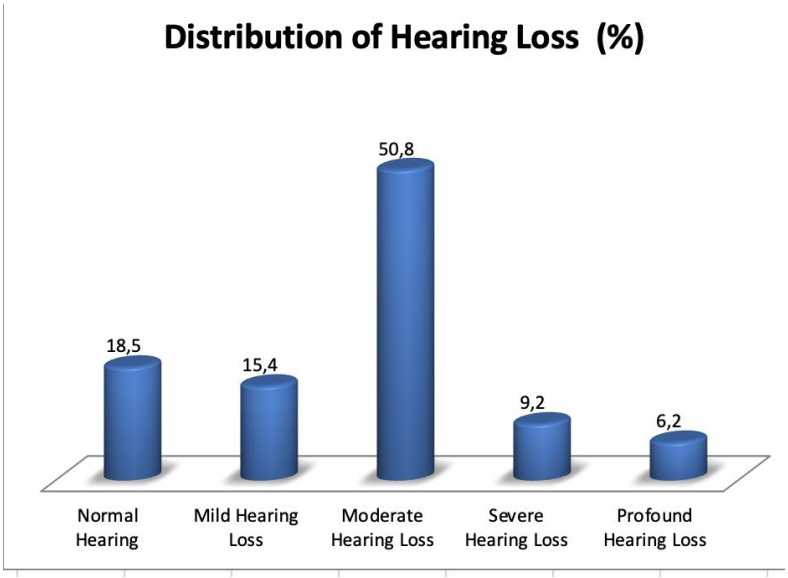
All patients with sensorineural hearing loss (100%) had two sides damage of hearing.

Minimal age was 32 years old, maximal 83 years old, medium age 62.69 years old, and standard deviation 62.69±11.32 years old.

| | Frekuence(N) | Percentage (%) |
|---|---|---|
| Normal Hearing | 12 | 18.5 |
| Mild hearing loss | 10 | 15.4 |

| | | |
|---|---|---|
| Moderate hearing loss | 33 | 50.8 |
| Severe Hearing loss | 6 | 9.2 |
| Profound hearing loss | 4 | 6.2 |
| Total | 65 | 100.0 |

Tab.2 Distribution of hearing loss




Graphic 1. Distribution of hearing loss

Based on the studies done before there is a higher presence of sensorineural hearing loss in our study (81.5 % of hemodialysis patients) than in the studies reported before. In our study hearing loss is mostly moderate sensorineural hearing loss. (50.8 %) of hemodialysis patients had moderate sensorineural hearing loss). Hearing loss affected more the high frequencies.

On the study of Jamaldeen et al hearing loss as established by pure tone audiometry average was present in 50 out of 120 (41.7 per cent) chronic kidney disease patients and 18 out of 120 (15 per cent) controls ($p$=0.001). Hearing thresholds were abnormal at low frequencies (250 Hz to 1 kHz) in 33 (27.5 per cent) patients and at high frequencies (2 kHz to 8 kHz) in 93 (77.5 per cent) chronic kidney disease patients. Hearing thresholds were abnormal across all frequency ranges in 52 (43 %) chronic kidney disease patients. Thus, high-frequency hearing loss was the most common hearing impairment among chronic kidney disease patients.(14)

Reddy et al reported from the study done in a group of 200 hemodialysis patients that sensorineural hearing loss was present at 4000 Hz in 53.5% individuals (48%

bilateral, 5.5% unilateral) and 8000 Hz in 63.5% individuals (61% bilateral, 2. 5% unilateral).(9)

Charachon *et al*. reported that 75% of 54 patients with chronic kidney failure had hearing loss. (10) Kusakari *et al*. reported on inner ear function of 229 patients on chronic hemodialysis. They found that 60% had hearing loss.(11) Johnson and Mathog noted high frequency hearing loss in 61 adults early in the course of hemodialysis.(12) Bergstrom and Thompson reported that 47% of 151 pediatric end-stage renal patients had hearing loss.(13)

## Conclusions

Sensorineural hearing loss is very common in hemodialysis patients. The hearing loss affects more the high frequencies but without a specific pattern. In the patient care of hemodialysis patients should be included the routine hearing monitoring test.

## Acknowledgments

We would like to thank the patients for their collaboration.

## Conflict of Interest

The authors declare that they have no conflicts of interest.

## Author Contributions

Emirjona Vajushi followed these patients, drafted and revised this manuscript.

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This article does not contain any studies with human or animal subjects performed by the any of the authors.

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