

Thessaloniki, 19-21 March 2021

2nd ICOHEMA 2021

"Preparing for a new world in health management: opportunities and challenges"

ISBN: 978-618-5630-04-1

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ICT IN HEALTH MANAGEMENT

ARTIFICIAL INTELLIGENCE AND ETHICS IN HEALTHCARE AT TURBULENT TIMES

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ABSTRACT

Artificial Intelligence (AI) and its applications seem to have enormous potential in healthcare governance and in particular for the surveillance of COVID-19. AI has a valuable role in healthcare governance, but also has certain pitfalls, in that its scope of application in the health field is not always explicit from an ethical and human rights perspective. It must be conceded that this complex technological evolution raises daunting challenges to the existing ethical rules, crucial ethical dilemmas as well as perils ranging from threats to patient safety, confidentiality, privacy and autonomy. A crucial question is how Ethics can make a difference.

KEYWORDS: Artificial Intelligence (AI), COVID-19 pandemic, Ethics, General Data Protection Regulation (GDPR), Human Rights.

PURPOSE

The shudders of the COVID-19 pandemic have provoked newer challenges in the healthcare governance as of the 31st of December 2019 outbreak of the virus worldwide (Bragazzi et al. 2020; Chatterjee et al. 2020). Particularly, the COVID-19 pandemic is causing an unprecedent human suffering, compelling health systems and health care stakeholders to their limits. According to the European Center for Disease Prevention and Control (ECDC) since 31 December 2019 and as of 28th October 2021, over 244 million people worldwide hab been infected with the COVID-19 virus. Specifically, in the European Union (including the United Kingdom) almost 73 million cases of COVID-19 have been reported. At the same time, in the European Union (including the United Kingdom) almost 1 million 400 thousand people had lost their lives to COVID-19. It is evident that transmission of the virus is still widespread, although several countries are confronted with stable or diminishing case rates. Nevertheless, absolute numbers remain high, with augmenting case rates among older age groups and augmenting death rates in several countries. Around one third of countries are experiencing increases in hospitals or Intensive Care Units (ICU) admissions due to COVID-19. This serves as a reminder of the great significance of preserving public health and physical distancing measures and that these measures should not be loosened, even in countries with diminshing trends (ECDC, 2021). Indeed, the COVID-19 pandemic has triggered a tremendous health, economic and social crisis globally. In the face of the pandemic outbreak, the resources, mechanisms and capability of healthcare systems are restrained and can be rapidly consumed. Following that, to avoid squandering resources and to better apportion those disposable, in the contemporary health landscape and in the health policy agendas there has been a growing necessity for employing Artificial Intelligence (AI) and its potential future forms, such as General and Super Intelligence, to strengthen healthcare systems, to contribute to patient data management, personalized monitoring of the patients and follow - up treatment. Consequently, AI is taking center stage in mitigating the spread of the pandemic (Parker et al. 2020; Sekalala et al. 2020). Within this context, this paper explores the employment of AI in an effort to contain the spread of the COVID-19 pandemic, as well as the increasing use of AI in healthcare governance, involving issues of protection patients' personal data according to the General Data Protection Regulation (GDPR), the ethical conflicts raised between individual rights and collective wellbeing concerning data dissemination, the quest for innovative technological solutions, such as contact tracing applications to assist monitor the spread of the virus and the potential ethical concerns they raise (Bostrom, 2011; Brännmark, 2019; Sekalala et al. 2020).Undoubtedly, AI has a valuable role in healthcare governance, but also has certain pitfalls, in that its scope of application in the health field is not always explicit from an ethical and human rights perspective. Hence, it must be conceded that this complex technological evolution raises daunting challenges to the existing ethical rules, crucial ethical dilemmas as well as perils ranging from threats to patient safety, confidentiality, privacy and autonomy. To this end, a crucial question is how Ethics can make a difference (Bostrom, 2011; Brännmark, 2019; Mason and Laurie, 2006; Sekalala et al. 2020).

RESEARCH METHODS

The present paper draws on existing literature research / review and evidence and applies a systematic document analysis / a systematic review. The present review is aimed at overviewing the potential applications of AI based on the existing Ethical guidelines in the Healthcare sector in the global effort to manage the pandemic. In particular, this paper explores the employment of AI in an effort to contain the spread of the COVID-19 pandemic, as well as the increasing use of AI in healthcare governance, involving issues of protection patients' personal data according to the General Data Protection Regulation (GDPR), the ethical conflicts raised between individual rights and collective well being concerning data dissemination, the quest for innovative technological solutions, such as contact tracing applications to assist monitor the spread of the virus and the potential ethical concerns they raise. To this end, a significant research question is: How Ethics can make a difference? For that purpose, we conducted a systematic literature research in order to formulate a comprehensive review that summarizes different approaches concerning AI, Ethics and Human Rights to prevent and control the spread of COVID-19. In addition, a list of keywords were used with different combinations, as follows: COVID-19, pandemic, artificial intelligence, ethics, general data protection regulation, human rights. We also collected relative information and data from certain literature sources, from seven (7) scientific papers and four (4) books regarding AI, Ethics, Human Rights' protection and Healthcare, as well as six (6) documents by the European Commission (EC), the Official Journal of the European Union, the World Health Organization (WHO) and the European Centre for Disease Prevention and Control (ECDC), the International Covenant on Civic and Political Rights - ICCPR, regarding issues of medical technologies, data protection and data dissemination, as well as the guidelines for proper use of modern technological applications in the fight against the pandemic, etc. A critical discussion on the risks, ethical challenges and limitations of the aforementioned technological applications are also included.

In general, a literature review, regarding a set of research queries, is a significant methodological tool to provide the researchers with suitable answers. For instance, reviews are of great use when the researcher wants to assess the theory or the evidence in a specific area or to thoroughly examine the validity or accuracy of a specific theory or a number of theories. In addition, literature reviews are useful when the purpose is to provide an overview of a certain issue or a research problem. It can be used, for instance, to define deficiencies during the research or merely debate upon a particular issue. According to the aforementioned, there are a number of existing guidelines for literature reviews. Depending on the methodology required to succeed the purpose of the review, all types can contribute to conducting the research and to attain a specific goal. The types of review include the systematic review, the semi-systematic review, and the integrative review. Under the right circumstances, all of these review forms can be of significant help to answer a particular research question (Snyder, 2019).

RESULTS AND DISCUSSION

From the burst out of the pandemic, solidarity has been palpable and robust. Healthcare actors were and still are at the forefront of the pandemic, working intensly day and night in order to treat COVID-19 patients. Notably, the COVID-19 crisis lead to an inevitable deficiency of available medical staff, mechanisms, resources, inadequate protective equipment, limited information on promptness resulting in an overexposure of the healthcare staff to the virus. Thus, in the face of the pandemic outbreak, the resources, mechanisms and capability of healthcare systems are restrained and can be rapidly consumed. Following that, to avoid squandering resources and to better apportion those disposable, in the contemporary health landscape and in the health policy agendas there has been a growing necessity for employing Artificial Intelligence (AI) and its potential future forms, such as General and Super Intelligence, to strengthen healthcare systems, to contribute to patient data management, personalized

monitoring of the patients and follow - up treatment. Consequently, AI is taking center stage in mitigating the spread of the pandemic (Adnan Abir et al. 2020; Craglia et al. 2020).

In particular, AI comprising of the fields of machine learning, natural language processing and robotics can be adjusted to almost any field of medicine and its contributions to biomedical research, medical education and delivery of healthcare seem unlimited. Specifically, AI based algorithms contribute to the development of vaccines and potential forms of treatment. Additionally, various AI applications, such as robots, smart phones, other wearable devices, such as smart watches that monitor temperature, pulse and sleep of a COVID-19 case, or with geographical location ability or smart applications for facial recognition, contact tracing and warning concerning the COVID-19 pandemic are being employed in an effort to track a diagnosed COVID-19 case and notify its recent contacts to self-isolate. Some anticipate that super computers and AI applications with their analytical power may enable diminution in the costs and time required to confine the pandemic, as well as to detect patterns or potential treatments preventing the spread of the virus. Notably, AI and its applications seem to have enormous potential in healthcare governance and in particular for the surveillance of COVID-19. Accordingly, public health surveillance constitutes a systematic assortment, storage, usage and dissemination of personal data information to identify an outbreak and mitigate the spread of the disease (Sun et al. 2020; Parker et al. 2020; Sekalala et al. 2020). In light of the current global pandemic, the World Health Organization (WHO) defined that the key objectives of global surveillance of the COVID-19 pandemic are to monitor trends in COVID-19 disease at national and global level, to rapid localize new cases in countries where the virus is not circulating, as well as monitor cases in countries where the virus begun to spread, to provide epidemiological data, to guide promptness, awareness and response measures, to identify, follow-up and quarantine of contacts, to detect and restrain clusters and outbreaks and to censure long term epidemioloigic trends and the evolution of COVID-19 virus (WHO, 2020a).

In further guidance on public health surveillance during the COVID-19 pandemic, the European Commission in its Communication of November 2020 argued that the European Union surveillance systems must be reinforced with capabilities for detecting, monitoring and surveying of emerging diseases. Accordingly, "EU surveillance systems must be bolstered with capacities for detecting, monitoring and the surveying of emerging diseases. The experience from COVID-19 also highlighted the important ability to increase capacity of frontline diagnostic laboratory testing, from which further data is accessible and necessary for the management of novel diseases. Up-to-date surveillance data enables the monitoring of trends in the incidence of communicable diseases over time and across Member States, and allows rapid detection and monitoring of cross-border outbreaks. The rapidly evolving technological environment and digital solutions (AI, High Performance Computing, computational models and simulation system) provides an opportunity to update surveillance systems, integrating data from new and different sources, and to create sensitive systems that detect early signals. A modern approach to surveillance should be used, relying on linking and integrating relevant surveillance systems, using electronic health records and harmonised datasets, environmental data, data analytics and artificial intelligence, social media - linked with modelling and forecasting capacity and dedicated highperformant digital computing platforms. Enhancing these technologies will increase the capacity of the EU and its Member States for accurate risk assessments, rapid response and informed decision-making. The ECDC's key role in establishing integrated surveillance and monitoring systems at the EU level, including research data and data on health systems capacity for diagnosis, prevention and treatment of specific communicable diseases as well as patient safety, should therefore be reinforced.." (European Commission 2020a: 14-15).

In this context, the European Commission launched on April 2020 a Recommendation under the title "On a common Union toolbox for the use of technology and data to combat and exit from the COVID-19 crisis, in particular concerning mobile applications and the use of anonymised mobility data". Specifically, article 12 of the Recommendation states that "since the beginning of the COVID-19 crisis, a variety of mobile applications have been developed, some of them by public authorities, and there have been calls from Member States and the private sector for coordination at Union level, including to address cybersecurity, security and privacy concerns. These applications tend to serve three general functions: (i) informing and advising citizens and facilitating the organisation of medical follow-up of persons with symptoms, often combined with a self-diagnosis questionnaire; (ii) warning people who have been in proximity to an infected person in order to interrupt infection chains and preventing resurgence of infections in the reopening phase; and (iii) monitoring and enforcement of quarantine of infected persons, possibly combined with features assessing their health condition during the quarantine period. Certain applications are available to the general public, while others only to closed user groups directed at tracing

contacts in the workplace. The effectiveness of these applications has generally not been evaluated. Information and symptom-checker apps may be useful to raise awareness of citizens. However, expert opinion suggests that applications aiming to inform and warn users seem to be the most promising to prevent the propagation of the virus, taking into account also their more limited impact on privacy, and several Member States are currently exploring their use." (European Commission 2020b: 3). Furthermore, article 13 of the EC Recommendation defines that "some of those mobile applications could be deemed medical devices where they are intended by the manufacturer to be used inter alia for diagnosis, prevention, monitoring, prediction, prognosis, treatment or alleviation of disease and would therefore fall within scope of under Regulation of the European Parliament and of the Council. For selfdiagnosis and symptom-checker applications, where they provide information related to diagnosis, prevention, monitoring, prediction or prognosis, their potential qualification as medical devices according to the medical devices regulatory framework should be assessed." (European Commission 2020b: 3). While in article 15 the EC signified that "warning and tracing applications are useful for Member States for contact tracing purposes and can play an important role in containment during deescalation scenarios. They can also be a valuable tool for citizens to practise effective and better targeted social distancing. Their impact can be boosted by a strategy supporting wider testing. Contact tracing implies that public health authorities rapidly identify all contacts of a confirmed COVID-19 patient, ask them to self-isolate, and rapidly test and isolate them if they develop symptoms. In addition, anonymised and aggregated data derived from such applications, combined with information on disease incidence, could be used to assess the effectiveness of community and physical distancing measures. While these applications are of evident usefulness for Member States, they also potentially add value to the work of the ECDC." (European Commission 2020b: 3).

During this global public health crisis, many countries have restricted individual rights, implementing drastic measures, such as the 14-day quarantine, social distancing, as well as confinement to people's daily activities. In this context AI mediated public health technologies contribute to the control of individuals and societies. These technologies comprise of tools for massive digital surveillance, e.g. computer vision techniques for facial recognition, traffic cameras for population monitoring, temperature monitoring, combining clinical, biometric and social data in order to provide information to health authorities, along with the development of algorithms to track and trace citizens with COVID-19 or even to estimate people's return to their work places. Although governments justify the enforcement of such digital applications as a means for controling and mitigating the spread of the COVID-19 virus, yet many controversial ethical and human rights' challenges arise (Gómez-González and Gómez, 2020).

IMPLICATIONS

At the same time many crucial questions have been raised and need to be reviewed during these critical times: Should personal data (health data, location data, biometric data and contacts) be anonymized or deleted after the pandemic is mitigated? Should these personal data be disposable to private companies for further medical research? (Gómez-González and Gómez, 2020). Under the International Human Rights Law, states ought to take robust public health surveiilance measures in order to protect the rights to life and health (Sekalala et al. 2020). Accordingly, article 1 of the 1966 International Covenant on Civic and Political Rights (ICCPR) states that: "1. All peoples have the right of self-determination. By virtue of that right they freely determine their political status and freely pursue their economic, social and cultural development. 2. All peoples may, for their own ends, freely dispose of their natural wealth and resources without prejudice to any obligations arising out of international economic co-operation, based upon the principle of mutual benefit, and international law. In no case may a people be deprived of its own means of subsistence. 3. The States Parties to the present Covenant, including those having responsibility for the administration of Non-Self-Governing and Trust Territories, shall promote the realization of the right of self-determination, and shall respect that right, in conformity with the provisions of the Charter of the United Nations." (ICCPR, 1966: art.1). While article 12 declares that "1. Everyone lawfully within the territory of a State shall, within that territory, have the right to liberty of movement and freedom to choose his residence. 2. Everyone shall be free to leave any country, including his own. 3. The above-mentioned rights shall not be subject to any restrictions except those which are provided by law, are necessary to protect national security, public order, public health or morals or the rights and freedoms of others, and are consistent with the other rights recognized in the present Covenant. 4. No one shall be arbitrarily deprived of the right to enter his own country." (ICCPR, 1966: art.12).

In the case of COVID-19 pandemic these rights-based obligations are crucial, as surveillance is indispensable to break the chain of the virus transmission and acquire as much knowledge and information as possible in order for the healthcare authorities to promote newer medical medical interventions and techniques, drugs and vaccines (Sekalala et al. 2020; WHO, WTO and WIPO, 2020b). Meanwhile, debates and arguments regarding the potential harms from digital health technologies have emphasized the adoption of legally binding ethical and human rights principles and guidelines for just and people-centerd digital health technologies. Establishing ethical boundaries on digital health technologies can be serious for promoting rights and mitigating harms and these boundaries are often applied to adjust healthcare actors, whether individuals or organizations. Nevertheless, ethical principles might no be concrete and specified and enforcement mechanisms can be feeble. Thus, adopting and employing human rights norms that enshrine fundamental ethical principles into law can grant vigorous opportunities for enforceability and accountability. Namely, thw key ethical principles already applied to public health and biomedical researches include consent, beneficence, autonomy, privacy, transparency, inclusiveness, non-discrimination, equity and accountability. Specifically, digital health technologies should employ the "do no harm" principle and should prevent any harms, that may occur. Additonally, any personal information concerning patients' health, biometric, personal data safeguarded and protected applying the informed consent principle. Furthermore, the development and enforcement of digital health technologies should allow public feedback, monitoring and algorithmic transparency. Moreover, ethics and human rights principles underline the significance of equity and inclusiveness and propose these digital health technologies to take into consideration the needs of vulnerable and marginalized groups, including women, children, migrants, racial and ethnic minorities (Sun et al. 2020; Mason and Laurie, 2006).

The COVID-19 pandemic has triggered an unprecedented provocation for the European Union and the Member States, their healthcare systems, social life, economic stability and ethical and human rights values. Evidently, digital technologies and data have a valuable role to play in fighting the COVID-19 virus (European Commission, 2020c). AI and its applications seem to have enormous potential in healthcare governance and in particular for the surveillance of COVID-19. They engage in monitoring the spread of the virus in real time in order to reduce the virus transmission, coordinating public health interventions, censuring their effectiveness, developing new medicines and vaccines, as well as identifying potential vaccine candidates. It is therefore significant that all responsible healthcare actors recognize the ethical challenges raised by ensuring that the application of AI technology is consistent with ethical requirements, under which patients' rights, safety, privacy and autonomy are prioritized (Adnan Abir et al. 2020; Sekalala et.al 2020).

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UI DESIGN OF BUSINESS INTELLIGENCE FOR VARIOUS LEVELS HOSPITAL MANAGER

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ABSTRACT

Technological developments in the health sector in Indonesia have transformed the system from conventional to electronic, namely by implementing digital health. This is done as an effort to improve the quality and health services. One of its applications is in the hospital management information system. As from the Ministry of Health's report as of July 1, 2020, there were 1479 hospital management information system users, while 294 users did not use this (Saguni, 2020). This triggered a high enough competition for hospitals so that every level of manager in the hospital requires a decision support system, namely by utilizing Business Intelligence (BI). BI development at various hospital manager levels requires an interface design that can be accepted by the user before it is implemented in order to produce accurate data so that the resulting information is of high quality. The method used in this development is the prototype method, data sourced from SIMRS, and BI development stages include needs analysis, data analysis, data visualization, making use case diagrams, and BI interface design. The result of this development is the design of BI interfaces at various hospital manager levels, including the Director, Deputy Director of Services, and Deputy Director of Finance. The interface design is made with a blue technology background to show an elegant impression. As for data visualization, it uses maps, bar graphs, circle charts, line graphs, and speedometers with bright color choices, namely red, orange, yellow, green, blue, and purple with gradations to make it easier for users to get the information needed. The BI developed meets the design principles of O'Gllitz (2007). BI development is very important to be implemented in order to support the hospital business process so as to create a more prosperous Indonesian society and achieve the highest public health status. Therefore, the results of this study need to be followed up and implemented in further research.

KEYWORDS: User interface design, business intelligence, level of hospital managers.

PURPOSE

Designing a user interface Business Intelligence (BI) for various levels hospital managers based on user needs. The development of technology in the health sector has transformed the system from conventional becoming electronic, by implementing digital health. The application of digital health is carried out as an effort to improve access and quality of health services. It is hoped that this can be integrated with the Department and Ministry of Health so that it can improve performance, effectiveness, and efficiency in health services for the community (Saguni, 2020).

One of the applications of digital health is the application of the Hospital Management Information System (HMIS). The application of hospital management information system is able to improve management and planning performance in terms of effectiveness and efficiency so that many hospitals have started implementing HMIS. The Ministry of Health's reported that by July 1, 2020, 1479 hospitals has been using HMIS. On the other hand, only 294 hospitals did not use HMIS yet (Saguni, 2020). The Ministry of Health provides GOS HMIS which is an open source that can be used by hospitals for free. However, the hospital also develops it on its own or in collaboration with the HMIS developer company to suit their individual needs.

One of the IT development companies in the health sector is CV Sahabat Mediacom. This company has developed various health products. Among of the product is the Sahabat Hospital Management Information System (SHMIS). SHMIS has various features including the dashboard as a general decision support system. This helps the managerial level in the hospital to carry out its business processes. However, along with the intense competition in the world of health, considering that almost all hospitals apply sophisticated information technology, some clients want more extensive information for various levels of managers in the hospital to improve services and strengthen their business strategies.

Accurate informations are very important for management level to support decision-making. Information is an important asset in an organization and the ability to manage it determines the welfare and success of the organization in the future. However, according to Sungkar et al (2011), the more complex information in the organization the more difficult to be managed. Tools are needed to manage and present the information. This can be done by utilizing big data sources from HMIS to produce accurate and precise information.

The use of technology, Business Intelligence (BI), can be used to solve the problem. The BI system was developed to process and analyze data into useful information and provide support to assist decision-making in hospitals (Atsani et al, 2019). BI can also assist companies in analyzing changing trends which can determine the strategies needed to anticipate changes in these trends (Arifin, 2014). Therefore, BI has a competitive advantage to regulate rapid competition in the world of health both nationally and internationally (Bahiyah and Sejati, 2012).

BI development at various levels of hospital managers requires an interface design that can be accepted by the user before being implemented. This was created so that the result of BI could display information according to user needs and take care of the principles of good interface design. In addition, it is also so that the information conveyed is easy to accept, both in terms of content and visualization. In accordance with Bank and Cao (2014), a good interface design must maintain the perfect balance between aesthetically pleasing aesthetics and interactivity that does not require more effort. Therefore, in this study the authors designed the BI user interface for various levels of hospital managers.

1. Prototype Method

This method is an iterative process in system development where the requirements are converted into a working system which is continuously improved through cooperation between the user and the analyst (Muharto and Ambarita, 2016). The evolutionary prototype development step consists of four steps, determining user needs, creating a prototype, determining whether the prototype is accepted, and using the prototype (McLeod and Schell, 2008).

2. Business Intelligence

BI is broadly defined as a collection of theories, methods, processes, architecture, and technology that transforms data into useful and meaningful information for business purposes, which can be used to identify information that is very useful for the benefit of developing new business opportunities (Adrianto, 2019).

3. Big Data Analytics

Big data analytics is the process of analyzing big data to provide past, current, and future statistics and useful insight to make better business decisions. Big data analytics is broadly classified into data analytics and data science, which are interconnected disciplines. Data

analytics focuses on the collection an interpretation of data, typicall with a focus on past and present statistics. Data science, on other hand, focuses on the future by performing explorative analytics to provide recommendations based on models identified by past and present data (Ankam, 2016).

4. Needs Analysis

Analysis is the initial stage in system development and is a fundamental stage that greatly determines the quality of the information system being developed (Muslihudin and Oktafianto, 2016). This stage

describes the conditions or capabilities that must be met by the system in accordance with the specifications desired by the user, including information needs, the need for an application or data processing process to produce this information, and hardware requirements (Maniah and Hamidin, 2017).

5. Data Visualization

Data visualization is a way to communicate information and help analysts to convey complex information simply through images, patterns, trends, data distribution, heatmaps, and so on (Perdana, 2020). According to Kirk (2019), data visualization is the visual representation and presentation of data to facilitate understanding. Some things that must be fulfilled in performing high-level abstraction according to Shneiderman (1996) are: overview (seeing an overview of the total data), zoom (enlarging items that look interesting), filters (filtering items that are deemed lacking. interesting), details-on-demand (select an item from a certain group and can see details at any time), relate (see the relation of each item), history (can repeat or return to the previous action), and extract (can perform extraction of the given parameters).

6. Use-Case Diagrams

Use-case diagrams are diagrams of the expression of a system's functions from the perspective of system users, identifying the functionality of the system, users of the system (actors), and associations between users and system functionality (Pressman, 2010).

7. User Interface Design

The user interface is a part of the computer and its software so that the user can see, hear, capture, speak or understand, or direct. The purpose of user interface design is to make work activities with computers easier, more productive, and comfortable. The general principles in designing user interfaces according to O'Galitz (2007) include accessibility, compatibility, control, directness, efficiency, familiarity, flexibility, forgiveness, immersion, positive first impression, predictability, safety, simplicity, and visibility.

RESEARCH METHODS

Prototyping method was used in the development process. This research was carried out from January to February 2021. The method used in this development is the prototype method. Data was taken from the SMHIS. BI development stages include needs analysis, data analytics, data visualization, design use-case diagrams, and user interface design. If the interface design fits the need analysis, the design can be used. However, if the design is not suitable with the needs, the research steps are repeated from the need analysis as in Fig. 1. The software used to make use-case is Microsoft Visio 2010, for data visualization using fushioncharts.com, and for making user interface design using Corel Draw X7.





The following are steps that have been undertaken for the design of the BI interface for various levels of hospital managers.

1. Needs Analysis

In the needs analysis, the required provisions are that the BI user interface design at various hospital manager levels must meet several managerial levels, the director, the deputy director of service, and the deputy director of finance. The information displayed on BI is each adjusted to the data contained in the SHMIS.

At the director level, the director can view the entire BI interface, both the deputy director of services and the deputy director of finance. However, deputy directors only have access to their respective fields. In addition, BI visualization is expected to have a colorful design to make it easier to read and can be accessed wherever and whenever the various level managers need it to access.

2. Data Analysis

At this stage, the authors get data from SHMIS, especially the Reports menu, which is a component of data items whose patterns can be found and useful as information. The data item component then being entried such that it can be visualized.

The results of data analysis were in the form of information for each level manager. At the director level, information covers all departments of service and finance. In the service section, the information provided includes total visits, average visits per day, hospital visitors (New-Old), visits based on the payment method, gender, recent, sub-district, inpatient (per inpatient room), and outpatient care (per polyclinic), Top 10 Inpatient Diseases, Top 10 Outpatient Diseases, infectious disease, drug stocks (Generic Formulary-Non Formulary Drugs, Non-Generic Formularies, Non-Generic Non Formularies), availability of beds, Gross Death Rate (GDR), Net Death Rate (NDR), Bed Occupancy Rate (BOR), Length of Stay (LOS), Turn Over Interval (TOI), and Bed Turn Over (BTO), as well as service status/conditions.

As for the finance section, the information generated includes total income, average income per day, and target income, income by type, method of payment, polyclinics, inpatient rooms, and support units, BPJS Claim status, and distribution of how to pay patients. as well as financial status/condition.

3. Data Visualization

The results of data visualization come from the analysis of the data generated and visualized using bar graphs, line charts, circle charts, speedometers, and maps.

4. Use-Case Diagrams

In the use-case diagram, there are 3 users, the director, the deputy director of service, and the deputy director of finance. Each user has their own access rights as in the diagram.



Figure 2. Use-Case Diagram

5. User Interface Design

The results of the visualization are then combined with the interface design based on each level manager. Following are the results of the BI user interface design at various hospital manager levels.

a. Login Page

When users access the system for the first time, they must go through a login process. On the login page, it says "BUSINESS INTELLIGENCE HOSPITAL X". This is intended to introduce BI systems to users. Furthermore, to enter the system the user must input the username and password and enter the numeric sum code to verify that the login is a human. If the information entered is wrong, the system will notify you that the entered username, password, or code is incorrect.



b. Page for Director

BI Director is used by directors. At BI Director, directors can monitor service conditions as well as financial conditions that are visualized on the appearance of each BI. If the director wants to see the service conditions, the director can click the Service button. Likewise, if the director wants to see the financial condition of the hospital he manages, by clicking the Finance button. The following is a draft BI for the Director interface.





BI for Director displays information in real-time and users can view information based on the desired filter period by inputting the date then clicking Show.

c. Page For Deputy Director of Service

BI Deputy Director of Services is used by the deputy director of services of a hospital. The information presented at BI includes total visits, average visits per day, hospital visitors (New-Old), visits based on

the payment method, gender, recent, sub-district, inpatient (per inpatient room), and inpatient. roads (per polyclinic), Top 10 Inpatient Diseases, Top 10 Outpatient Diseases, infectious disease, drug stocks (Generic Formulary-Non-Formulary Drugs, Non-Generic Formularies, Non-Generic Non-Formularies), bed availability, Gross Death Rate (GDR), Nett Death Rate (NDR), Bed Occupancy Rate (BOR), Length of Stay (LOS), Turn Over Interval (TOI), and Bed Turn Over (BTO). In addition, BI of Service also displays service conditions that describe the overall service status and is equipped with a choice of supporting colors, namely green for safe conditions, red for unsafe conditions, and yellow for risky conditions. The information displayed on BI Services is also the same as BI for Director, real-time and users can view information based on the desired period filter by inputting the date then click Show.



Figure 5. Interface Design of BI for Deputy Director of Service

d. Page For Deputy Director of Finance

This page used by the hospital's deputy finance director to monitor financial conditions in real-time. The information displayed on BI for Deputy Director of Finance includes total income, average income per day, and target income, income by type, payment method, polyclinic, inpatient room, and support units, BPJS claim status, distribution of patient payments, and financial status/condition. In the financial status/condition information section, the information displayed describes the financial condition of the hospital and is supported by a color that indicates its status, namely yellow for income that has not reached the target, red for losses, and green for safe or stable and exceeding the target.



Figure 6. Interface Design of BI for Deputy Director of Finance

RESULTS AND DISCUSSION

The design of BI interfaces including the login page, Director, Deputy Director of Services, and Deputy Director of Finance, according to user needs.

1. Needs Analysis

Needs analysis is a fundamental stage in system development. According to McLeod and Schell (2008), the purpose of this stage is to determine an overview of the system to be built as a whole and in accordance with the needs and business processes being carried out. In the needs analysis, the authors

conducted an online discussion with CV Sahabat Mediacom to find out the picture of BI to be built. In addition, the author also conducted a documentation study through the SHMIS, which saw the Reports menu and data items to be visualized at BI.

The BI that is wanted to be developed is one that can support user mobility. Therefore, BI was developed based on a website. According to Simarmata (2010), a website application is an information system that supports user interaction through a website-based interface.

Regarding the need for BI data, it is sourced from the SHMIS, which is precisely the Reports menu covering the Services and Finance section. However, not all of them are listed because they are tailored to the needs.

2. Data Analysis

At this stage, the authors get data from SHMIS, especially the Reports menu, which is a component of data items whose patterns can be found and useful as information. The data item component is then made (free) data entry so that it can be visualized. The results of data analytics are in the form of information for each level manager that has been tailored to the needs.

3. Data Visualization

After the information is obtained from data analytics, the next step is to communicate it in an attractive, clear, and on-target manner (Perdana, 2020). Data visualization used in BI uses several charts sourced from fushionchart.com. Data visualization at BI Director is useful for the director to monitor the condition of the hospital he is leading, both in terms of services and finances. The data visualization at BI Services is useful for monitoring the quality of service and improving the quality and quality of hospital services by making the right service strategy. Likewise, data visualization in BI Finance is useful for finances to manage finances and monitor the financial condition of the hospital.

4. Use-Case Diagrams

Use-case diagrams are made using Microsoft Visio 2010. According to Pressman (2010), use-case diagrams aim to describe the interactions between actors and the processes or systems created. In the resulting use-case diagram, it can be identified that the use-case has 4 components, namely a system in the form of a BI system at various levels of hospital managers, actors or users are the director, deputy director of service, and deputy director of finance, a use-case that describes what can be carried out by users, as well as associations that describe the relationship between users and use-cases. As in the results, the Deputy Director of Services (actor) has several use-cases, including being able to see (association components) the availability of beds, GDR, NDR, BOR, LOS, TOI, and BTO (use-case) through the BI hospital (system).

5. User Interface Design

The interface design designed in this report is divided based on the level of the hospital manager, the director, service officer, and finance officer as well as the login page. BI is made in several levels intended to support business processes in each field and can monitor business processes that occur in hospitals in real time and can be accessed anywhere. Users usually assess the appearance of the interface first before the functioning of a system. Therefore, the interface is made by prioritizing aesthetics without neglecting its function so that it is made using Corel Draw X7.

The color selection at BI uses a dark blue background and is accompanied by a blue technology wallpaper background so that it displays an elegant impression. Color selection according to Proboyekti (2008) can add an extra dimension to an interface and help users understand complex structures. The color selection for visualization uses bright colors such as red, orange, yellow, green, blue, and purple. This is done according to a needs analysis to use bright and colorful colors but still display an elegant impression. This is different from the BI development carried out by Silvana, et al. (2017) which uses a white background and combines visualization with color combinations as in the visualizations in this report. As for the research of Pestana, et al. (2020) using a tone of color selection that is compatible with only different brightness, such as young Tosca and old Tosca so that the appearance of the appearance is softer.

The font selection on the interface uses the Bahnschrift font and consistently uses only these fonts. This font selection is based on easy legibility. As for the overall view, in this case, scrolling is avoided, so that the BI display is only one screen that can later be displayed on the monitor in each room of various levels of managers in the hospital. The BI interface has met the principles of interface design by O'Gallitz (2007), including according to user needs, minimizing eye movement because it does not use the scroll, and can give a good impression through color selection and elegant appearance.

IMPLICATIONS

BI development is very important to support the hospital business process to achieve the highest public health status. Therefore, the results of this study need to be followed up and implemented in further research.

Development of BI for various levels of hospital manager is important to do in order to monitor business processes and support decision making occurs quickly and accurately. In this study, BI has been developed starting from needs analysis, data analysis, data visualization, use-case diagrams, and interface designs according to user needs, namely the level of the Director, Deputy Director of Services, and Deputy Director of Finance by using data from SHMIS.

The development of BI for various levels of hospital managers in this study only reached the interface design. Therefore, further research needs to be followed up for prototype development to BI implementation at various hospital manager levels following the design that the authors have made in this research.

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HEALTH MARKETING

STUDY OF PATIENTS' SATISFACTION AS A COMPETITIVENESS MEASURE IN PRIMARY HEALTH CARE.THE CASE OF FOUR REGIONAL CLINICS IN THE MUNICIPALITY OF VISALTIA, SERRES.

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ABSTRACT

The need for 'Quality' in health services is a long-term goal for governments. As health centers are the first set-up of health system that health users come into contact with, it is very important to reflect the degree of their satisfaction as well as their expectations, aiming at identifying problematic situations, collecting information for the continuous improvement and upgrade of quality in health services. The aim of this study is to capture the degree of patient satisfaction with the services of Primary Health Care and more specifically with four (4) regional clinics in Municipality of Visaltia, Central Macedonia.

KEYWORDS: patient satisfaction, regional clinics, Serres Prefecture.

PURPOSE

Quality in health services has been a demand even since the time of Hippocrates, where there was care for the safety of all medical procedures and especially for the continuous improvement of quality in health services (Liakopoulos, 2008).

It is a fact that health services are special, as health is a good that people enjoy from the beginning of their life until death. All decisions, therefore, despite their differences, converge on the achievement of the optimum. The concepts of effectiveness and cost are in the aftermath of Community.

It should also be pointed out that quality includes two dimensions: the first relates to the procedures of prevention, diagnosis and treatment, while the second relates to the behavior of all health professionals and other staff who provide health services and to the buildings and the environment in which health services are provided. It is a fact that while health providers give greater attention to diagnosis and treatment, health users are more interested in equal access to health services, in the way they are treated and in the behavior of health professionals (Sigalas, 1999).

The measurement of quality, especially in health services, is very important since, according to the World Health Organization, the aim of all governments and policies should be to improve the level of health of

the population. The concept of measuring quality includes comparison with a defined standard, in order to highlight problems and malfunctions and to implement the appropriate structural changes for improvement (Goula, 2007).

Primary Health Care is patient's first contact with health system. It includes 'Public Health' and out of hospital health care. The term "Public Health" refers to all structures that aim at promoting health, prevention, increasing life expectancy of citizens and improving their standard of living. One of the main structures for the provision of primary health care are Health Centers, either of the Urban type or the Regional Health Centers of semi-urban areas (Liaropoylos, 2007).

The measurement of patients' satisfaction is carried out primarily by using filtered questionnaires in which patients are asked to reflect their perceptions, opinions and observations in general from the health services provided in clinics they visit (Tsopaloglou, 2010).

In Greece, as the few studies that have been carried out in the last 10 years have shown, the satisfaction of health users is affected by the understaffing of health centers, which is the result of the reduction of expenditure on Health Care centers of the state budget. The smooth operation of both the Health Care Centers and the Regional Clinics is an urgent need, especially in Greece where the economic crisis had great negative consequences in health sector.

Based in the criterion above, the aim of this study is to capture the degree of patient satisfaction with the Services of Primary Health Care and more specifically with the health services provided in four (4) Regional Clinics in Serres, Central Macedonia which are departments of Nigrita's Health Center: the Regional Clinic of Sitochori and its clinics: Zervohori, Houmniko and Lagadi.

This research attempts to give answers to the following main research questions:

-How satisfied are patients with the regional clinics they visit, that is, with the general conditions, the accessibility, the waiting area (the heating/cooling, how clean this is) the doctor-technical equipment, the treatment of an urgent case etc.

-What is the degree of satisfaction with the medical staff, i.e. the frequency of the doctor's presence in the Clinic, his/her behavior, the doctor's knowledge and experience for diagnosis and treatment, the information given to patients, the protection of personal data and the way in which the patient's company is being treated.

-Is it considered that the presence of health care workers contributes to the support and service of patients?

-What is the patients' personal view about their health condition?

-How satisfied are patients with the quality of the services provided by the facilities of the Primary Health Care in total?

-Whether patients would recommend to others the same Regional Clinics that they visit themselves. Moreover, the purpose of the study is to create correlations between the respondents' answers and their demographical data. A further objective of this research is to highlight the dysfunctions and problems in the decentralized properties of the Regional Health Centers, in order to take the appropriate measures for primary health care and to upgrade the quality of the services provided by its facilities.

RESEARCH METHODS

The sample of the population studied are health users, the uninsured as well as beneficiaries of the EOPYY, who visit the specific Regional Clinics of Visaltia, Serres, to receive health services and have the ability to respond reliably to the contents of the questions. More specifically, the survey is attended by people over the age of 55 who live in Sitochori, Zervohori, Humniko and Lagadi, as well as in the wider area of the Municipality of Achinos.

The questionnaire contains 27 questions, which were created according to previous authoritative studies and adapted for the needs of this research. The first 19 questions are the main questions of the survey and the other 8 address the demographic characteristics of the sample. At a theoretical level, the questionnaire is divided into five sections. The method of sampling chosen was random stratified sampling.

The analysis of the data was done using the statistical program IBM SPSS version 21, while for the correlation of variables, tests such as x2 and t test were used.

RESULTS AND DISCUSSION

The respondents that participated in this survey are 125. Men were the 56 of them and 69 were women. The vast majority of them were engaged in agriculture and belonged to the former Agricultural Insurance Organization. 46% of the respondents, the largest percentage of the sample under study, came from the regional clinic of Sitochori, a village in which the main clinic is located, 23% from the regional clinic of Houmniko, 17% from the regional clinic of Zervohori and 14% from the clinic of Lagadi. The percentages above result from the fact that the regional clinic of Sitochori has the main clinic, and on the other hand from the fact that Sitochori is the largest municipal unit in population of the other three and therefore presents the highest degree of patient traffic according to the patient book which is kept.

Starting with the structure of the regional clinics and specifically with the conditions in its waiting area, patients satisfaction is not related to their gender, since the majority of them, as mentioned above, stated that they were satisfied, while the statistical control showed no correlation of the two variables (chi-square 0.462). Similarly for the heating conditions especially during the winter months, period of time during which the completion of the questionnaires took place, where the result was chi-square 0.942, as well as for the existing medical equipment where chi-square 0.149 and for the accessibility to the clinic where chi-square 0.196.

In contrast to gender, however, a positive and statistically important relationship emerged between the level of education of the respondents and the above-mentioned prevailing conditions in the clinic. In particular, the respondents who declared compulsory education as an educational level appeared completely satisfied with the heating conditions of the clinic with(chi--square 0,038), the waiting area(chi--square 0, 000), cleanliness(chi-square 0.003) as well as the existing equipment (chi-square 0.003).

Similar to the level of education were the results in the correlation of the insurance institution of the participants in the survey and their satisfaction with the existing structures. The vast majority of respondents belong to the former Agricultural Insurance Organization and presented a positive and statistically important relationship with the cleanliness conditions of the clinic (chi-square 0.05), heating (chi-square 0.004), accessibility (chi-square 0.038) as well as the waiting area of the clinic (0.001).

Finally, as with gender, so with age, the satisfaction of patients is not related to their age, since the largest percentage of them, who even belong to the so-called third age (>70 years) appeared satisfied while the statistical test showed no correlation of the two variables. As far as age and heating conditions are concerned, it emerged (chi-square 0.165), the cleanliness of the clinic (chi-square 0.374), the accessibility (chi-square 0.111) and the waiting area (chi-square 0.208).

In the regional clinics that were studied the presence of the doctor is not daily but once or twice a week as mentioned above. However, the vast majority of respondents stated that they were satisfied with the frequency of having a doctor, which was found to be positively and statistically significant and related to the age of the participants (chi-square 0.024) The results were similar from the correlation of the participants' satisfaction with the doctor's training (chi-square 0.002) but also from their satisfaction with the general behavior of the doctor (chi-square 0.003).

Based on the above, the correlation of the proposal of the respondents for a recommendation to some others to visit this doctor in the regional clinic of their village (chi-square 0.000) emerged as positive and statistically significant. Regarding the level of health in which they are in proportion to their age and the services provided to them by the regional clinic of their village to improve it, the existing relationship was positive and statistically significant (chi square 0.000).

Similar to gender, the correlation of age with the characteristics that compose the picture of satisfaction of the participants with the doctor of their regional clinic emerged as positive and statistically significant. Regarding the frequency of the doctor's presence, the result was chi-square 0.024, his/her training chi-square 0.002 and her general behavior chi-square 0.003.

Therefore, the correlation with the recommendation to someone else to visit doctor's office (chi-square 0.002) but also the general satisfaction for their level of health in proportion to their age (0.000) was positive and statistically significant.

Studying the results so far of both the statistical tests and the distribution of frequencies regarding the satisfaction of the participants with the presence of the doctor in the regional office but mainly with the services provided by it, it is easily understood that the presence of the doctor makes the elderly inhabitants of the Greek countryside feel more secure. The combination of doctor's presence and his or her overall behaviour, with the use of any means available in each regional clinic, satisfy the participants.

Regarding the absence of nursing staff, in the under study regional clinics, respondents stated that they would like to have nursing staff in the doctor's office who will work as an adjunct to the doctor, but there was no statistically significant relationship between the existence of nursing staff and their attendance at the regional clinic (chi-square 0.196). This happens because they visit each regional clinic primarily for the doctor and the provision of medical care by him or her, as well as for prescribing drugs for their chronic treatment.

At the end of the statistical tests, it was considered prudent by the researchers to examine it as a variable since the questionnaire had included the relationship as a separate variable of the quality of services provided with some key variables that determine the image of participants in our research. So starting with the gender of the respondents and their general opinion about the quality of the services provided, they were not found to be statistically significant (chi-square 0.067), a fact which can be attributed to the fact that the vast majority of respondents were satisfied with the services which they enjoy from clinics and they visit them regardless of their gender. The same happened with their age where the result of the statistical control was chi-square 0.867, but also with their insurance carrier, that is chi-square 0.087.

Contrary to the above results, the relationship between the profession and the general quality of services provided (chi-square 0.001) was found positive and statistically significant. Despite the fact that the majority of survey participants have the opportunity to visit private clinics at certain intervals and to receive health services from other specific specialties and certain medical conditions, they stated that they are still satisfied with the care provided in the regional clinic of their village.

Starting from the results of the statistical analysis, we would say that the need of the inhabitants in under study areas to have a doctor near them is very obvious. Most of them are in their later years, live away from their children and some of them have lost their partner. For all these reasons they need a person to whom they can turn to for help if needed. Despite the fact that they said they were satisfied with the frequency of the doctor's presence in the regional clinic of their village, most of them would not be negative in the extension of this frequency.

In addition, the patients-participants were found to give great importance to courtesy, respect, psychological support of themselves and their attendants by the doctor as well as attach great importance to doctor's training on how to deal with a chronic health problem. Additionally they give great importance on how the doctor deals with the continuing, stopping or changing the chronic treatment they follow to treat any health problem they face. This is the reason why they stated that they trust their doctor to the same degree as the specialist doctor who had prescribed the specific treatment from the beginning.

The majority of our sample stated that they were satisfied with the conditions prevailing in the regional clinic of their village, such as the heating in the winter months, the cleanliness, the accessibility, but also stated that due to their need to visit the clinic and consult their doctor the incomplete satisfaction of these conditions would not be a deterrent for them. They also consider the presence of nursing staff very important and they believe that the staff will act as an adjunct to the medical work and in no case will replace it.

Regarding medical equipment, even though the majority of the participants were satisfied with the efforts and care of the doctor, they declared that medical equipment, consumable medical supplies would greatly facilitate medical work and make them feel more secure in an emergency situation without having to move to another health facility.

Regarding whether they would recommend another person to visit the doctor's office in their village, they stated that they would do so mainly because of the trust and appreciation they have for their doctor.

IMPLICATIONS

Based on the above, it becomes clear that the effort to strengthen the local primary health clinics becomes imperative. This can happen by hiring adequate medical staff so that more patients visit them and financing them so that they can be equipped with further medical mechanical equipment and necessary materials.

A future study may have a larger sample and cover a more extensive geographical area, such as a study of Health centers in central Macedonia or other geographical areas in Greece. The interview could also be used as a method of data collection for quality results.

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JOB SATISFACTION IN NURSING

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ABSTRACT

Job satisfaction is defined by the overall feeling, that employees feel, as well as their personal feelings regarding their salary, the opportunities for promotion, the extra rewards, their boss and colleagues, the nature of the work produced, the working conditions and the level of communication between the different parts in the organization (Spector 1985). The study was conducted using JSS questionnaire. Low overall job satisfaction was documented. Satisfaction was influenced by responsibility, salary, shifts and work experience. The results depict the multilevel nature of job satisfaction.

KEYWORS: JSS Questionnaire, job satisfaction, nursing management, health system.

PURPOSE

According to Paul Spector's (1985) scale, job satisfaction is defined as the overall feeling that employees feel but also individuals' feelings about their salary, promotion opportunities, special rewards, their boss and their colleagues, the nature of the work produced, the working conditions and the level of communication between the different parts of the organization.

The study of job satisfaction should be based on two categories of variables:

- Endogenous or individual or demographic variables, that are related to the internal motivations and personal experiences of each employee and
- Exogenous or environmental variables, related to the effects that the person receives from his work environment. (Δεληχάς, 2010).

Purpose of this paper is to capture the degree of job satisfaction of nursing staff in the workplace of a sensitive sector, such as of the hospital "G.H.TH. Saint Dimitrius ". Investigating the degree of professional satisfaction will firstly help to document the influence of the organization and management of the hospital on employee's satisfaction. This will reveal ways to improve it.

The main research questions asked at this research are:

1) What is the percentage of job satisfaction of the nursing staff in the General Hospital of Agios Dimitrios?

2) What are the factors that affect staff satisfaction or dissatisfaction?

3) What is the correlation between staff satisfaction and salary, age, years of service, employment contract, and professional studies?

RESEARCH METHODS

To serve the purposes of this study, it was considered more appropriate to use a quantitative method, using a questionnaire. For this reason, the largest possible sample of participants was used, so that there will be a greater possibility of generalizing the results to the specific organization.

The research tool used was the Job Satisfaction Survey (JSS) questionnaire, a tool that has been widely used to assess worlds job satisfaction and was developed in 1994 by Paul E. Spector, a professor in the Department of Psychology at the University of the South Florida and although it was conducted for research in health care organizations, it was eventually used in other types of organizations, that want to record the job satisfaction of their employees. This research tool is freely available online for educational and research purposes at http://paulspector.com/ in English. The Greek translation tool of the present study comes from the translations into languages of other countries from the same internet address together with the instructions of completing it, as well as the instructions of evaluating its results.

The Job Satisfaction Survey (JSS) questionnaire is structured based on 36 elements related to work and describes 9 factors of work, which can be factors of satisfaction or dissatisfaction for employees. Each of the 9 factors corresponds to 4 elements and the total score is calculated, which finally reflects the degree of job satisfaction, from all the elements. Job satisfaction assessment is achieved using the Likert scale, with six options per item ranging from "strongly disagree" to "strongly agree". The data are written in both directions, with negative and positive wording, so that about half of the data must be reversed. The nine factors are salary, promotion, supervision, privileges / benefits, potential rewards (performance rewards), operating conditions (required rules and procedures), partners, nature of work and communication. The recording of the JSS data is either positive or negative. The answers for each item start with "totally disagree" which equals 1 and ends with "totally agree" which equals 6, the results for each of the 9 factors, consisting of 4 items, vary between 4 and 24 and the results of the total satisfaction that includes all 9 factors can be captured between 36 and 216. The negative formulation of an item must first be graded by the participant on a scale of 1 to 6. Then the researcher, before coding the question, must reverse the score as follows: 1 to become 6, 2 to become 5, 3 to become 4, 4 to become 3, 5 to become 2 and 6 to be done 1. The sequel requires the sum of each factor separately, before the final and total sum. The scores lead to the results of the study and describe how regarding:

- Items with a score above 4 indicate satisfaction, below 3 dissatisfaction and between 3 and 4 neutralities
- ▶ factors with a score of 16-24 indicates satisfaction, 4-12 dissatisfaction and 12-16 neutrality
- Overall satisfaction rating 144-216 indicates satisfaction, 36-108 dissatisfaction and 108-144 neutrality (<u>http://paulspector.com/</u>).

The research questionnaire consisted of three parts. The first part mentions the consent of the participants, the preservation of their anonymity, the subject of the study, the instructions for completing the questionnaire. The second part includes the Greek version of the Job Satisfaction Survey (JSS) questionnaire, and the third part contains the demographic and occupational data of the sample, relating to age, gender, marital status, educational level, years of service, professional capacity, working hours, net monthly income and employment contract. It was pre-screened by distributing ten questionnaires and processing them two weeks before the start of the survey. This questionnaire was chosen because its completion time does not exceed ten minutes and is a significant advantage for the responsiveness of the research sample.

The population and the sample of the research were the nursing staff of all educational levels of the hospital "G.H.TH. Agios Dimitrios "in Thessaloniki, with at least one year of service.

The place of the study is the "G.H.Th. Agios Dimitrios ", a hospital in Thessaloniki that has 175 beds, which aims to provide Primary and Secondary health care. The data collection took place at the hospital between 20/9/2019 and 31/10/2019. The data were collected after the distribution of the questionnaires placed in yellow opaque envelopes with the instruction to the participant that after its completion to enclose it, seal the envelope and deliver it to a specific delivery point, which had been designated by the researchers. The sample for the selection of research participants was based on probability sampling.

Population and sample of the study was the nursing staff of all levels of "G.H.Th. Agios Dimitrios ", which consists of 206 employees.

The participants were selected based on the inclusion criteria in the study, which are the following:

- The consent of the nursing staff
- Work experience at least 1 year

• Ability to communicate in Greek

For the needs of the study and the fidelity of the results, 200 questionnaires were distributed, considering each form of leave from work and the corresponding absences from the workplace. 154 questionnaires were received, of which 2 were invalid and 152 were valid, representing a participation rate of 76% on the distributed questionnaires.

46.1% were aged 45-54, 34.2% 35-44, 15.1% older than 55, 4.6% 25-34 and none of the participants were under 25. Most of the respondents were married in 75% (n = 114) followed by the unmarried in 13.8% (n = 21), the divorced in 7.2% (n = 11), the widowhood in 2.6% (n = 4) and the cohabitation status at 1.3% (n = 2). 81.6% (n = 124) were women and 18.4% (n = 28) were men. Most are technological education graduates at a rate of 46.7% (n = 71), followed by High school graduates with a rate of 38.8%(n = 59), postgraduate holders at 11.8% (n = 18) and university graduates at 2.6% (n = 4). They work from 11-20 years at a rate of 38.8% (n = 59) following in smaller percentages those who work for 31 years and over at 25.7% (n = 39) and from 21-30 years at 25% (n = 38). The percentage of 10.5% (n = 16) of those who work from 1-10 years is small, a fact that may be justified due to the fewer recruitments in the last decade and there is no percentage of employees with less than one year of service, as they were excluded from the research. 9 of them were supervisors (n = 9) 5.9%, 12 nurses in the position of head of department (n = 12) 7.9%, 68 nurses (n = 68) 44.7% and 63 nursing assistants (n = 63) 41, 4%. Most of the participants work in shifts at a rate of 75% (n = 114) and the rest without shifts, at a rate of 25% (n = 38). 62.5% (n = 95) of the participants are paid with a net monthly income ranging between 1000 and 1500 euros, 35.5% (n = 54) receive a salary of up to 1000 euros and only a small percentage of 2% (n = 3) exceeds at a salary of 1500 euros. The ratio between the permanent and the contracted nurses of the sample gives to the permanent the percentage of 96.7% (n = 147) and to the contracted ones the 3.3% (n = 5) and is absolutely justified if it is a public hospital (table1).

sex	Female= 124	Male= 28	Total =152	
age	25 to 34 years =7	35 to 44 years=52	45 to 54 years= 70	over 55 years=23
education	university graduates= 75	secondary school graduates/team leaders=59	postgraduate students=18	
Marital status	Married=114	Single=23	Divorced=11	Widows=4
working experience	more than 31 years=39	21-30 years=38	11-20 years=59	1-10 years=16
Occupation	Head nurse=9	Assistant Head Nurse=12	Nurse=68	Nurse Assistant=63
Working Hours	Morning=38	Shifts=114		
Salary	Up to 1000=54	1000 to 1500 =95	1501up to 2000=3	
employment contracts	Permanent=147	Non-permanent=5		

 Table 1

 Characteristics of the participants

To present the results related to the answers of the nurses, who participated in the research, a frequency analysis was performed. Additionally, the descriptive command was executed to examine the means. Quantitative variables are presented as mean (\pm standard deviation) while qualitative variables as frequency (%). The normality of the sample was also checked using the Kolmogorov Smirnov test. In order to investigate possible differences between the satisfaction of the nursing staff and socio-demographic and occupational factors, non-parametric and parametric tests were performed. (Mann-Whitney test/Independent samples t-test, Kruskal Wallistest/One-Wayanova).

The instrument used in this survey showed good reliability (Cronbach a), ranging from 0.741.

The statistical analysis was performed with the statistical program IBM SPSS Statistics 23. A value of p <0.05 was considered to indicate statistical significance.

RESULTS AND DISCUSSION

The answers to the 36 items of the questionnaire describe that the lowest score of 1.47 is observed in item 10 "The increases are small and sparse" and the highest in item 27 " I feel proud doing my job" with a score of 4.97.

Low overall job satisfaction was documented regarding salary, promotion, benefits, potential rewards and communication, on the other hand operating conditions factors, associates and nature of work is moderate and the supervisory factor high (table 2).

FACTORS	Mean	Satisfaction
Pay	7,9276	Dissatisfied
Promotion	9,8224	Dissatisfied
Supervision	16,6579	Satisfied
Fringe Benefits	8,6974	Dissatisfied
Contingent Rewards	10,0000	Dissatisfied
Operating Procedures	12,8026	Ambivalent.
Coworkers	14,5461	Ambivalent.
Nature of Work	15,4276	Ambivalent.
Communication	11,3421	Dissatisfied
Total	107,2237	Dissatisfied

Table2Job satisfaction of factors

Most nurses (82 persons, 53.9%) were dissatisfied and only 6 persons (3.9%) were satisfied and the remaining 64 (42.1%) were neutral / moderate, which contributed to the overall low satisfaction (table 3).

Table 3 Level of Satisfaction

LEVEL OF SATISFACTION	Frequency	Percent
Score 36-108= Dissatisfied	82	53,9%
Score 108-144= Ambivalent.	64	42,1%
Score 144 to 216= Satisfied	6	3,9%
Total	152	100,0%

There were no statistically significant differences in satisfaction between age groups, marital status, gender and educational level.

In terms of the nature of the work, nurses who have worked for 31 years or more are most satisfied, as well as there were statistically significant differences between the professional qualities-positions in terms of satisfaction (overall score) with those nurses who hold a position of responsibility (supervisors) to show the greatest satisfaction. Also, the nurses with a position of responsibility (supervisors) show the greatest satisfaction in the factor of salary, promotion and the nature of the work, while in the factor of operating conditions the assistant nurses presented the highest levels of satisfaction. There were statistically significant differences between shifts in terms of satisfaction (factors) with those nurses who had morning shift showing the greatest satisfaction in the salary factor. In terms of operating conditions, shift nurses showed the highest levels of satisfaction (factors) with those nurses regarding the salary in terms of satisfaction (factors) with those nurses who had salaries of 1501-2000 euros showing the greatest satisfaction in the supervisory factor.

Satisfaction was influenced by responsibility, salary, shifts and work experience.

The answers to the research questions are listed below:

1. What is the percentage of job satisfaction of the nursing staff of the General Hospital of Agios Dimitrios?

The job satisfaction rate is displayed as a rating of the JSS questionnaire data and is reflected in the number 107.23 which indicates, based on the guidelines provided by the author of the questionnaire, dissatisfaction or low satisfaction from the participants. The results indicate that most nurses (82 people, 53.9%) were dissatisfied and only 6 people (3.9%) were satisfied. Since the survey involved 152 valid questionnaires on the total population of 206 nurses (73.8%) of the hospital, as stated in the organization chart, it could be concluded that the above rating, which describes dissatisfaction or low job satisfaction of the nursing staff of the General Hospital "Agios Dimitrios" is representative.

2. What are the factors that affect staff satisfaction or dissatisfaction?

Based on the answer to the first research question, which reflects low job satisfaction or dissatisfaction of the nursing staff of this hospital, in this research question we will describe the factors that contribute to the result and that have been categorized by the structure of the research. The nine factors considered are salary, promotion, job benefits, potential rewards, supervision, communication, operating conditions, co-workers and the nature of the job. Job dissatisfaction was formed when the factors of salary, promotion, privileges-benefits, possible rewards and communication were reflected in low job satisfaction, in the factors of working conditions, partners and nature of work were neutral or questionable job satisfaction and only in the factor of supervision, job satisfaction is described.

3. What is the correlation between staff satisfaction and salary, age, years of service, employment contract, and professional studies?

The expressed dissatisfaction or low job satisfaction of the nursing staff of the specific nursing institution is not described in the results of the research as being affected by the salary, age, years of service, employment contract and professional studies. There is no significant statistic difference, which can substantiate any difference between the specific components and job satisfaction, except that participant with 31 years or more of service experience show higher satisfaction in the factor nature of work.

There is an effect on the level of satisfaction of the nursing staff from the factors of years of service, position of responsibility, working hours and monthly salaries. There was no effect of socio-demographic factors (gender, age, marital status, educational level). It seems that nurses with more years of work, who have a position of responsibility and with higher salaries experience higher satisfaction.

The first limitation of the research can be the subjectivity of the answers, related to the expectations from the work and the resulting satisfaction, since each person can experience in a different way the achievement or the refutation of his expectations on a personal and professional level. This can be overcome by involving as many nurses as possible in the population of a research to enable more reliable generalizations.

A second limitation may be a contraction in the judgment of the supervisor or manager or the organization in general, because the bad judgment may have bad consequences for the employee, but it can be dealt with by ensuring the anonymity of the participants, as well as by sealing the dossiers containing the answers.

IMPLICATIONS

The hypothesis in this study was confirmed by describing low general job satisfaction or dissatisfaction of the nursing staff in a representative sample of 73.8% of all nurses in this hospital. Only 6 (percentage 3.9%) of the 152 participants appeared to be experiencing job satisfaction. The factors examined as pillars of general job satisfaction were basically dissatisfied and only the supervisory factor was satisfied, while the factors of salary and benefits-promotion were given the lowest score.

No specific correlations with socio-demographic data were recorded and the nurses who were described as most satisfied with their work are those with more years of service, who have a position of responsibility and with greater financial earnings. (82 people, 53.9%) were dissatisfied and only 6 people (3.9%) were satisfied. The remaining 64 of the participants (42.1%) are in the category of moderate or

neutral job satisfaction, contributing to the creation of the impression of dissatisfaction or low job satisfaction.

Nurses' satisfaction is a dynamic, multilevel and complex concept, reflecting objective, subjective, macro-social and micro-individual, positive and negative influences that interact. We would say that it is a multidimensional structure consisting of wide areas - psychological and social function - that are affected by both working conditions and the disease and / or treatment of their patients.

The measurement of the satisfaction of the nursing staff by the health services and especially by the working environment of a hospital, in the last decades, is an important tool for the evaluation of the quality of the specific services. Capturing their views on how services are provided, relationships with colleagues, communication and management, combined with clinical trials, can provide safe conclusions about the operation of different health organizations and levels of health care. Interesting is the recording of satisfaction of nurses from the working environment that exists in public hospitals as it reflects the effectiveness of the National Health System.

Most studies at nurses usually describe the degree of satisfaction. Assessing the relative impact of work in a public hospital on the level of satisfaction is necessary for better planning and distribution of resources for research, training and health care, to further promote the safety of nurses. A complete framework for healthcare will be based on a single guiding principle: that the goal of confrontation of the physical, social and psychological aspects of chronic diseases is directly linked to satisfaction and the working conditions of the nurses.

The final and only user of health and welfare services is the client-patient and since the literature has shown the correlation of the services provided with the level of job satisfaction of the providers of these services, it becomes necessary to provide motives to improve job satisfaction of the employees with the goal of optimizing the services provided and customer satisfaction. Based on this reasoning, we could suggest the improvement of nurses' salaries, as well as additional benefits, but also the procedures for practicing the profession.

In our proposals is the preparation of a detailed schedule concerning the duties, with a clear work outline for all nursing levels and an inviolable system of evaluation and professional development. The financial crisis has brought to the foreground various issues-dilemmas and one of them concerns the aging of the nursing staff, since the recruitment rates are very small in relation to the needs. Our proposal is the inventory of the nurses and the re-staffing of the nursing institutions, the strengthening of the staffing, the staffing not only based on the needs but also the wishes of the nurses, the legislation on the correlation between the percentage of shift hours and the age of the nurse and the years of service.

The systematic supervision and supervision of nurses, which will aim to produce better services and not punishment, as well as the empowerment of employees with the simultaneous management of conflicts and the increasing participation in decision-making are requirements-proposals that will improve the nursing profession and of course the job satisfaction of nurses.

Our proposal and demand of a large portion of the country's nursing staff is lifelong learning, in order to achieve continuous updating of professional skills, but also to provide incentives for continuing education, which can contribute to improving operating conditions.

The repetition of the present survey at regular intervals, with the aim of feedback to the organization, regarding employee satisfaction, its expansion to all professional groups and to all organizations is presented as a need in an environment as changing and as diverse as the environment of health services, since surveys like the present do not reflect only the percentage of job satisfaction of the employees of an organization, but also the needs created in the employees due to the general requirements of each era and in particular due to the requirements of the patients-patients, which ultimately is also the main reason for the existence of all individual investigations.

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INFORMAL HEALTH ECONOMY - THE PANDEMIC AS AN ACCELERATOR OF THE SHADOW MARKET OF HEALTH PRODUCTS

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ABSTRACT

After more than ten years of economic crisis, which has had a devastating effect on the economy and society - intensifying social inequalities and disorganizing the economy - in 2019 the pandemic (Covid-19) appeared, which is spreading rapidly worldwide, affecting public health, the economy and the social fabric of countries. The purpose of our work is to capture and analyze the forms of the informal economy in health and then to investigate the influence of the Covid-19 pandemic at the "shadow market" of medical products. The state of emergency, financial hardship, panic and misinformation have pushed consumers and suppliers into sub-economic trends such as Dark Web Marketplaces, also known as D.W.M., which are commercial websites - easily accessible - through free software, being an important "cell" of e-commerce. In this research, in addition to the theoretical approaches to informal economy and corruption, we will analyze 995 products and their prices exported from 24 official e-commerce stores and 24 Dark Web Marketplaces, during the period from January 2020 to January 2021. In this way we will investigate listings related to Covid-19 products, following the evolution of prices and terms of sale. In this way, an attempt will be made to quantify the "shadow" market and speculation of products related to the pandemic, but also to find any causal relationship between the two types of markets (official and unofficial), considering that our study is of particular interest to both researchers and public organizations, focusing on the protection of the economy and public health.

KEYWORDS: shadow economy, dark web marketplaces, e-commerce, covid-19, pandemic.

PURPOSE

After more than a decade of economic crisis, which has had a devastating effect on the economy and society, pandemic (Covid-19) appeared in 2019 and spreading rapidly worldwide, affecting public health and economies of countries. In Greece, the pandemic appeared in March 2020 with a continuous increasing trend of cases and deaths, while, in order to protect the entire population, the country was put in a lockdown. Counting one and half year from the appearance of the coronavirus, we can see significant consequences for the economy, social trends and the provision of health services. The economy is shaking, tending to return to 2010 levels, unemployment is rising, entrepreneurship is shrinking and public debt is steadily rising. Every structure of the National Health System is hitted hard by operating in marginal conditions, with limited resources and staff, with an average age exceeding 43 years (Greek Ministry of Health, 2018). The response of the National Health System to the fight against the pandemic is characterized as "heroic", managing to reshape and adapt to current needs. According to the World's Most Important (W.I.N.) Gallup Report (2014), the shadow economy is emerging as the most important pathogen that the economy and society has to deal with in recent years. Based on the Transparency International Report for 2020, our country ranked 59th out of 180 countries worldwide in terms of the Corruption Perceptions Index (C.P.I.), while it is generally accepted that the health sector is strongly characterized by informal economy, affecting the supreme good of health.

Shadow economic activity in the field of health is integrated as a measure of private health expenditure and includes informal payments in the public and private hospital sector, as well as part of those additional and direct payments that evade tax revenues in official income. It is a form of fraud that occurs when someone intentionally causes, or assists someone, to cause financial harm, related to the benefits of health care providers. It can be caused by providers of materials and services, such as doctors, clinics, pharmacests, pharmaceutical companies and suppliers of materials and health services, or even by the insured themselves, with the ultimate goal of growing economic ties between of them. Possible combinations may be the following: between doctor - insured, doctor - pharmaceutical company, insured - hospital, hospital - pharmaceutical company, pharmaceutical company - health care provider at administrative level and many other combinations. Fraud is a common issue, not only nationally, but also globally. Health is one of the sectors that is a fertile ground for the development of informal phenomena (Mackey T.K., Liang B.A., 2012). The significant expenditure of the health sector (public and private), without a sufficient institutional framework for their observance, is a special reason for the phenomenon. At all levels of health services there exist and operate strong and complex organizations of health professionals (doctors, nurses etc.), private health care providers, suppliers of medicines, materials etc., a network of common interests, but also conflicts of interest, which aims at a larger share of health expenditure. The existence of cases of corruption is the most important problem that the field of health faces today, which, however, should not be seen in isolation from its general organization and operation. The malfunctions of the health system need to be investigated and recorded. In addition, it is necessary to highlight the points that promote corruption and fraud, resulting in a burden on public finances (Lewis M., 2010). The prevention of waste, informal economy and corruption is therefore imperative, in order to increase the available resources and to make more efficient use of existing resources, ultimately improving the general state of health of the population. Effective control of waste, informal economy and corruption would reduce the public deficit, as the over-indebtedness of public hospitals and insurance funds contributes, among other things, to its eruption.

The purpose of our work is to capture and analyze the forms of the informal economy in health (such as informal payments, financing, provoked demand, nepotism, "shadow market" of drugs and health services, etc.) and then to investigate the influence of the Covid-19 pandemic in its most distinct measurable form, the "shadow market" of medical products. The pandemic has significantly reshaped demand and supply of goods and services worldwide. The state of emergency, financial hardship, panic and misinformation have pushed consumers and suppliers into sub-economic trends, such as Dark Web Marketplaces (D.W.M.), which are commercial websites - easily accessible - through free software, being an important "cell" of e-commerce. In our research, using the statistical package S.P.S.S., we will process and present descriptive and inferential statistics for price analysis for approximately 500 species of pandemic-related products (such as personal protective equipment, pharmaceuticals, vaccines, covidtests, medical equipment), which appear in 24 Dark Web Marketplaces, worldwide, during the period from January 2020 to January 2021, analyzing the price, and the terms of their sale. In this way, an attempt will be made to quantify the "shadow" market and speculation of products related to the pandemic, but also to find any causal relationship between the two types of markets, considering that our study is of particular interest to both researchers and public organizations, focusing on the protection of the economy and public health.

RESEARCH METHODS

We investigated the product prices related to the pandemic in 24 official e-commerce places & in 24 dark web marketplaces (E-COMMERCE SITES: https://pharmacymegastore.gr/, https://www.digas.gr/, https://medical.gr/,https://healthcareservices.gr/,https://www.koinis.gr/,https://www.vitalaire.gr/,https://www.skroutz.gr/,https://bluemedical.gr/,https://www.24medicare.gr/,https://sakarellos.gr/,https://medic al.gr/, https://www.marketresearchfuture.com/, https://www.galinos.gr/, https://www.lazaridis-k.gr/,https://www.diastasis.gr/,https://www.nivalhellas.gr/,https://ehappymarket.gr/,https://nicochem.gr/, https://www.fsa.gr/,https://www.eof.gr/,https://www.euroclinic.gr/,http://www.anadrasi.gr/,https://www.moh.gov.gr/, https://www.pharmacydepot.gr/. DARK WEB MARKET SITES: Black Market Guns, CanadaHQ, Cannabay, Cannazon, Connect, DarkBay/DBay, DarkMarket, Darkseid, Willhaben, Yellow Brick, ElHerbolario, Empire, Genesis, Hydra, MEGA Darknet, Plati.Market, Rocketr, Selly, Shoppy.gg, Skimmer Device, Tor Market, White House, Venus Anonymous, Wilhaben) during the period from January 2020 to January 2021 (13 months); we recorded 498 and 497 product prices from official e-commerce places & dark web marketplaces (Table 1), classifying them into 4 main categories a) personal

protective equipment (gloves, protective masks, surgical gowns etc.), b) Covid drugs and vaccines (hydroxychloroquine, favipiravir, remdesivir etc.), c) Covid tests and d) medical equipment and Covid items (respirators, oximeters, digital infrared thermometers etc.). Afterwards, we performed a statistical analysis, in order to infer basic descriptive statistics for price control, while we tried to investigate the price differences between the two types of markets, utilizing the p-value for testing zero and alternative hypothesis (t-test), and the relative correlation using Pearson Correlation Coefficient.

The prices used for our research were obtained from official e-commerce and the Dark Web. Dark Web crawling is performed by specialized software (Tor Browser). Finding Dark Web markets is a challenge, as crawlers have to bypass many security layers. Most of the Dark Web Marketplaces require authentication and some even require an invitation from preexisting Dark Web members. Downloading content from Dark Web Marketplaces remains a challenging task, which becomes even more difficult when the goal of the research study requires monitoring of many markets for an extended period of time; nevertheless, we managed to compile a data set with 497 prices for different types of products during the period from January 2020 to January 2021, for 24 different Dark Web Marketplaces (Table 1). On the contrary, the search and finding of corresponding prices and products in legal e-commerce (e-commerce) was very simple, managing to collect 498 prices for the period from January 2020 to January 2021 by investigating product prices and delivery times in 24 online stores (Table 2).

Product Categories	Official e-commerce prices	Dark Web Marketplace prices		
Personal protective equipment	221	220		
Covid drugs and vaccines	7	6		
Covid test	80	82		
Medical equipment and covid items	190	189		
Summary values	498	497		

Cable 1: Studied	prices in official	e-commerce places	& Dark Web	Marketplaces
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RESULTS AND DISCUSSION

Regarding e-commerce, we observe that despite the satisfactory availability of items and immediate delivery (<1 month), there are high price fluctuations in products of categories of personal protective equipment & covid medical equipment, while price fluctuations in medicines & covid tests are limited (due to official pharmaceutical policy) (Table 2). The "explosive" increases of product prices during lockdown periods (especially at the period from March to June 2020) "testify" to speculative dispositions of suppliers (prices increase when demand increases). A major problem is the inability of the Secretary General of Trade and Consumer Protection of the Ministry of Development and Investment to operates a price observatory, that aims to protect consumers and control prices. However, despite the investigation, we did not observe online sales of fraudulent medical products, covid vaccines, fake vaccination certificates and covid tests, as we observed in the Dark Web Marketplaces subsequently.

Table 2: Results of statistical analysis (t-test) of four categories of product prices for both markets by products category

Personal protective equipment						
	e-Commerce	Statistically Significant Difference				
Mean	7.405,380769 8.206,907692		-801,526923			
Sample size	221 220					
t	-2,776024879					
P(T<=t) two side	0,015735226					
Median	7.405,380769 8.206,907692					

Covid drugs and vaccines						
e-Commerce Dark Web Statistically Significant Differen						
Mean	15,85384615 1.553,076923		-1.537,223077			
Sample size	7	6				
t	-2,777638099					
P(T<=t) two side	0,016723456					
Median	15,85384615	1.553,076923				

Covid Tests					
	e-Commerce	Dark Web	Statistically Significant Difference		
Mean	9.305,549231	19.929,15385	-10.623,60462		
Sample size	80	82			
t	-6,2920	028706			
P(T<=t) two side	3,99497E-05				
Median	9.305,549231	19.929,15385			

Medical equipment and covid items					
	e-Commerce	Statistically Significant Difference			
Mean	245.355,1069	276.797,4292	-31.442,3223		
Sample size	190	189			
t	-3,553	771479			
P(T<=t) two side	0,001612572				
Median	245.355,1069	276.797,4292			

Source: Our processing of Data

To test the existence of a statistically significant difference in mean prices between e-commerce and dark web marketplaces, we used two specific formulations of statistical hypotheses, known as the alternative hypothesis (H_1) and the null hypothesis (H_0). The Null and Alternative Hypothesis of t-test can be formulated as follows:

- Zero Case (H₀): There is no statistically significant difference in mean prices between e-commerce and dark web marketplaces.
- Alternative Case (H₁): there is a statistically significant difference in mean prices between ecommerce and dark web marketplaces.

The results of Table 2 show that there is a statistically significant difference between the two types of markets, which means that the prospective buyer will explore the product market and their prices in both market forms (e-commerce and dark web marketplaces). Statistically significant difference between the two types of market, means that the consumer may be searching for cheaper product prices, but is also hunting for products that are not available in the standard markets (e-commerce), such as vaccines, drugs and tests, producing a causal relationship between the two types of market. The significance is higher between e-commerce and the dark web marketplace for the product categories covid test (p-value = 0,0000399497), as well as medical equipment and items related to Covid (p-value = 0,001612572). Simply put, a user planning to purchase Covid-related products, will firstly search their availability and prices in e-commerce, track them down, realize their limited quantities or non-availability, and afterwards turn to the dark web, making the corresponding search (Table 2).

In order to pinpoint the statistically significant difference, we took into account the mean difference, for the two market types and their respective product category. The most important mean difference (-1.537,223077) is located in the product category Covid drugs and vaccines (e-commerce mean: 15,85384615 & Dark Web mean: 1.553,076923), followed by the product category Covid Tests (-10.623,60462) (e-commerce mean: 9.305,549231 & Dark Web mean: 19.929,15385). Taking into account that the data follows a normal distribution, reveals that the mean equals to median. The above

median differences confirm that the acceptance of Alternative Case (H_1) , i.e., that there is a statistically significant difference in significance level 0.05, as revealed by the values between the prices of e-commerce and the ones of dark web marketplaces, and is especially important for the product categories Covid drugs and vaccines & Covid Tests.

For correlation analysis between the two types of markets (official e-commerce & dark web), we will use inductive analysis. The Pearson Correlation Coefficient is considered to be a good choice for describing the correlation between the two quantities, as in our case there is a large number of observations, while the data follows normality and each observation is connected to each other linearly. A first evidence that the distribution of our variables follows are normal is the fact that both the mean and the median of the sample are almost equal. Additionally, Skewness and Kurtosis measures indicate normality (table 3). Finally, Kolmogorov-Smirnov Tests indicate once again that the data follows the normal distribution (table 4).

Table 3: Skewness and Kurtosis test of four categories of product prices for both markets by
products category

PRODUCT CATEGORIES		E-COM	MMERCE DARK W			K WEB	WEB	
	Skew	ness	Kurt	osis	Skew	ness	Kurt	osis
	Statistic	Std.	Statistic	Std.	Statistic	Std.	Statistic	Std.
Personal	0.194	0.364	0.019	0.595	0.125	0.234	0.063	0.845
Covid drugs and	0.123	0.293	0.086	1.154	0.221	0.362	0.171	1.063
Covid tests	0.240	0.497	0.135	1.091	0.156	0.255	0.042	1.400
Medical	0.137	0.302	0.064	0.578	0.153	0.235	0.013	0.843

Source: Our processing of Data

Table 4: One-Sample Kolmogorov-Smirnov Test of four categories of product prices for both markets by products category

One-Sample Kolmogorov-Smirnov Test					
PRODUCT CATEGORIES		Personal protective equipment	Covid drugs and vaccines	Covid tests	Medical equipment and covid items
E- COMMERCE	Test Statistic & Asymp. Sig. (2-tailed) and p-value	0.175 (0.200)*	0.392 (0.242)*	0.253 (0.120)*	0.399 (0.124)*
DARK WEB	Test Statistic & Asymp. Sig. (2- tailed) and p-value	0.378 (0.145)*	0.414 (0.156)*	0.250 (0.083)*	0.422 (0.127)*

* in parenthesis is p -value

Source: Our processing of Data

As we observed from the results of the statistical processing of prices, this is true (Table 2), so we can proceed with the utilization of parametric criteria for the application of the Pearson correlation coefficient.

Applying Pearson Correlation Coefficient to our data, and as shown by the results of Table 5, there is a strong correlation between the two types of markets (official e-commerce and dark web marketplaces) especially for personal protective equipment και covid drugs product categories. The existence of a strong correlation between the two forms of market, means that a prospective buyer, once he has decided to supply such products, will search for prices, and other market conditions in both forms of markets, producing a relationship of interaction and relevance between the types of products sold, in e-commerce and the dark web alike. Regarding the Pearson Correlation Coefficient, the rate of the vaccine drug category is 0,972 (very close to 1 - showing a very strong correlation), revealing that potential buyers

will initially look for e-commerce drugs with coronavirus treatment (apparently they will not find, as confirmed by our research), and afterwards will resort to the dark web, in order to find similar drugs – vaccines; according to the same philosophy of thinking and searching in the two market forms, the Pearson Correlation Coefficient for individual media protection price is 0,651, showing the existence of strong correlation. On the other hand, the Pearson Correlation Coefficient, for covid-tests is 0.3314 and for medical equipment is 0.3182, this shows us weak correlation for these product categories. This means that the consumer will not associate his search for medical equipment and covid tests between the two forms of market. The consumer will look individually for these product categories either on e-Commerce or on the Dark web.

BRODUCT CAT	ECODIES	Personal protective equipment	Covid drugs	Covid tests	Medical equipment	
PRODUCT CATEGORIES		DARK WEB				
Pearson Coefficient	E COMMEDICE	0.651	0.972	0.3313724	0.31821486	
P-value (2-tailed)	E-COMMERCE	0.016	0.000	0.269	0.289	

Table 5: Pearson Correlation	Index study on	the variables	of four	categories	of product	prices for
	both markets	by products c	ategory	¥		

Source:	Our	processing	of	Data
Source.	Our	processing	UJ.	Duiu

On Dark Web Marketplaces we observed lower price fluctuations (compared to e-commerce), especially in the category of personal protective equipment and medical equipment covid items (Table 3 & 4), while access to the dark web does not require specialized equipment, or any special knowledge. We have also noticed the availability of vaccines & covid drugs, fake vaccination certificates and Covid testing and other illegal products, which is particularly worrying for the health of citizens and the institutional economy. For Dark Web Marketplace's products, there is the option of immediate shipping and availability of products worldwide (within the month), while it is possible to pay in all international currencies and cryptocurrencies (Bitcoin, Ripple XRP, Ethereum, etc.). Particularly harming and worrying, is the inability to control and restrict Dark Web e-shopping, despite efforts by the F.B.I., Interpol and Europol to cease all actions and shut down Dark Web Marketplaces. In conclusion, we investigated Covid-19-related products price listings in 24 Dark Web Marketplaces and 24 official ecommerce online stores, which were monitored for a period of 13 months (Table 2). We analyzed Covid-19 reports and special Covid-19 lists in Dark Web Marketplaces and official e-commerce. The Covid-19 special registrations amounted to 497 and 498 respectively and were categorized into four main categories: a) Personal protective equipment (gloves, protective masks, surgical gowns, etc.), b) Covid drugs and vaccines (hydroxychloroquine, favipiravir, remdesivir, etc.), c) Covid tests and d) Covid medical equipment and items (respirators, oximeters, digital infrared thermometers, etc.). Our research observed an increase in prices in the available e-commerce markets during the quarantine and the first wave of the pandemic. The mean price of Covid personal protective equipment and medical equipment and items increased sharply in March 2020 (Table 4), while price fluctuations intensified, as shown by the statistical analysis, probably due to speculation, and then decreased, in July, after the lifting of the lockdown restrictions in our country, where product prices and fluctuations tended to be limited to rational prices. A typical example is the N95 type mask that is sold in an online store in June 2020 at 6 euros per piece, while in January the same mask in the same online store is priced at 50 cents Euro. Unfortunately, the Ministry of Economic Development failed to effectively control the speculation and the informal economic trends of the market, during the difficult and highly inelastic period of the pandemic. On the other hand, Dark Web Marketplaces reacted immediately to the pandemic, by covering the supply of goods in high demand and trying to fulfill the wishes of customers through the availability and delivery of products, but also through the supply of drugs, vaccines and fake certificates, already in June - July 2020, when there was no tried or confirmed vaccination of citizens. Both the speculative trends in official e-commerce, and the distribution of illegal products from Dark Web markets, associated with the constant search for products and prices by consumers in both Marketplaces, to find available products, show strong trends that accelerate the informal economy, threatening the institutional economy and the health of citizens. Finally, as we have shown from the inductive statistics measures in our analysis, a statistical significance between the variables (prices of product types) in the two forms of
market has emerged and correlation between the variables (prices for personal protective equipment and covid-drugs) in two forms of market are very strong, observing a causal relationship between them.

IMPLICATIONS

Based on the results of our study, there are para-economic activities in the online sale of covid-related products, such as that of speculation and the sale of illegal products, generating profits for sellers and owners of commercial distribution channels of covid products to the detriment of consumers. Our study is a trigger to mobilize national authorities (such as the Ministry of Commerce, the Ministry of Health, the General Secretariat for Consumer Affairs, etc.) to control the selling prices of goods on the Internet, especially sensitive medical products related to covid, as well as international organizations in charge of preventing and combating cybercrime and other scams via the internet, in order to control and detect illegal products circulating in e-commerce (e.g in our case drugs and vaccines for covid). Furthermore, our study can be a trigger for further extensive research, analysis and investigation of speculation in both e-marketplaces related to health products and other markets, while such studies could protect consumers and many minors from the market illegal products and services that (as we have seen) are widely and freely provided to the consumer public.

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HEALTH POLICIES

THE COVID-19 PANDEMIC: POLICY CHALLENGES AND SOCIOECONOMIC ASPECTS

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ABSTRACT

The COVID-19 pandemic has progressed into an acute health crisis and the greatest challenge humanity has encountered since World War II. The fatal COVID-19 is having a devastating impact on health care systems, societies, individuals, families and economies at the international scale. In the case of COVID-19 influenza the social nature of prevention and control measures required the active enrollment of society. Therefore, in order to impede the transmission of the virus demographic and socioeconomic measures should be considered at the policy level in a global effort to break the chain of infection and avoid community contagion.

KEYWORDS: COVID-19, health systems, health policy, socioeconomic framework, demographic factors

PURPOSE

The dominance and severity of COVID-19 address the need to understand transmission patterns, clinical features and risk factors for infection, among others (World Health Organization, 2020c). The global community, scientists and governments worldwide exert a growing pressure to flatten the curve of propagating the transmitted disease. However, the diffusion of COVID-19 has been disparate in both emergence and speed of its propagation (Weiss and Navas-Martin, 2005). The current paper studies the within- and between-city transmissions of the novel infectious disease.

Also, health authorities design protocols to safeguard public health in addition to the announcement of basic sanitation rules and the proliferation of specialized medical facilities to treat COVID-19 patients. These are, namely, the existence of adequate frontline healthcare personnel, the increase in the number of hospital beds and intensive care units, wide availability of diagnostic tests, proliferation of medical supplies in designated hospitals, such as personal protective equipment and ventilators, among other factors (Anantham et al, 2008).

Moreover, disadvantaged socioeconomic background is ubiquitously linked to susceptible immune system and mortality (Hertzman, 2012). In particular, people with inferior socioeconomic status are more vulnerable in the occasion of an infectious disease outbreak (Oestergaard et al., 2012). Their social and economic context is either directly or indirectly associated with weak immune response and reduced life expectancy via several pathways. As far as the immediate causes are concerned, poor nutrition and inability to access health care services are related to increased comorbidity. As for the implicit factors socioeconomically vulnerable people due to poor education they receive have not developed health-related behaviours and may not be able to seek health protection when they need it (Pini et al., 2019).

Also, residence in cramped neighbourhoods, overcrowded accommodation, poor housing conditions could suppress the immune system and persisting inequalities reduce the prospects of upward movement in the social hierarchy. Additionally, unemployment and high job stress may prove to be threatening for the cardiovascular system (Kivimäki and Kawachi, 2015). Moreover, psychosocial job strain and insecurity are linked to disrupted immune response (Nakata, 2012). Moreover, unskilled workers who are occupied in low status jobs are often exposed to health hazards stemming from their contact with chemicals and toxic gases, which cause immune disorder and chronic respiratory diseases, such as asthma.

Consequently, socioeconomic deprivation seems to be inextricably linked to the recent pandemic. The community spread of disease will depend upon the specific local infrastructures and socioeconomic inequalities in each context. For example, densely populated neighbourhoods, vulnerable groups, like the Roma and refugee populations who reside in refugee camps are more susceptible to the virus attacks due to the congested living conditions. Moreover, GDP per capita is used in the study to express the level of economic development in a country as more poor countries encounter barriers in access to basic sanitation facilities and decent hygiene.

Therefore, additional mediating variables on the proliferation of COVID-19 include population flow and population density. It is perceived that reductions in population flow (Zhang et al., 2020) can significantly mitigate the prevalence of influenza. On the other hand, growth in trade may encourage disease transmissions (Adda, 2016). Higher income in a territory is also related to more trade activities and intensified travelling. In addition, areas with high GDP per capita have more social interactions, increased domestic and international flight connections as a result of expanded cross-country economic transactions. As a result, economic growth has been captured by the air passengers travel variable as more affluent countries seem to have more frequent air connections (European Commission, 2017). Therefore, an explanatory variable of global spread of previous influenza outbreaks is airplane travel. This mode of transport has contributed to the immense virus spread even across distant continents (Mangili et al., 2015).

The demographic gradient expressed by age and gender has been extensively discussed in the epidemiology literature (Moran and Del Valle, 2016). Despite the fact that people of all ages can be infected by COVID-19, older people seem to be more vulnerable since they often have underlying medical problems. Therefore, age is another important feature that requires particular attention in the COVID-19 pandemic. Elderly and more specifically the age group above 60 are over-represented among the COVID-19 fatal outcomes (United Nations, 2020). Ageing population may have weaker defensive health mechanisms to cope with the stress induced by the disease (Yoshikawa, 2000). Another significant demographic variable seems to be gender as men seem to be getting severely ill from COVID-19 more than women (Betron et al., 2020).

Smoking is an additional risk factor of developing a severe form of COVID-19. Moreover, smoking indirectly as well is associated with the above mentioned threat, as increased prevalence of smoking is related to the occurrence of cardiovascular and respiratory diseases, among others. Moreover, smokers seem to be more susceptible towards severe forms of COVID-19 and appear to have a higher mortality rate (Vardavas and Nikitara, 2020). In addition, climate conditions and in particular humidity and increased average temperature are considered by part of the literature to be negatively associated with the spread of COVID-19 (Wu et al., 2016).

RESEARCH METHODS

All the variables, which are employed for the analysis, have been derived for a global sample of 137 countries. As far as time coverage is concerned, it must be pointed out that data from the most recent available year were employed. The stepwise regression is used to estimate the coefficients of the model. Selected variables have been extracted from official statistics and other well-known international data sources.

Data on the number of confirmed coronavirus cases per million people, total deaths and recovered patients with respect to total confirmed coronavirus cases originate from the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University. Data on tests used to track coronavirus affected populations are provided per million people by country. Data on male population expressed as a

percentage of the total population, population density measured as people per sq. km of land area and the share of population aged 65 as a percentage of total population, which is employed as a proxy variable for ageing population, are derived from the World's Bank database of development indicators.

Moreover, to conceptualize and measure within and between countries' mobility and, as a result, increased contingency for possible virus transmission, the air transport passengers carried variable is used compiled by the World Bank and published in the above-mentioned database. More specifically, to approximate the level of economic development in each country, gross domestic product per capita in purchasing power parity is used transformed into a logarithmic scale ln(GDP) in order to facilitate empirical estimation. This variable is derived from the World Economic Outlook (WEO) database of the International Monetary Fund (IMF). Data regarding average temperature and humidity are also provided.

In order to capture the level of technological development and research infrastructure in a country, research and development expenditure as a percentage of GDP is used. In addition, death rate of population per 1.000 people in a country is, also, included in empirical estimates in addition to health expenditure as a percentage of GDP, which is used to proximate health infrastructure, as well as the existence of physicians per 1.000 people to crudely approximate the existence of health workforce. Data for cigarette consumption stem from the World Health Organization. The morbidity indicator is an

unweighted average of deaths caused in each country by serious illnesses and, more specifically, cardiovascular diseases, diabetes, chronic respiratory diseases and cancer. In case of patients with the afore-mentioned pre-existing medical conditions, then the presence of COVID-19 drastically increases the likelihood of death.

The unexplained part of the variance may be attributed to variables expressing social relationships, among other factors, which due to limited data availability for the global sample could not be included in the analysis. More specifically, these are country-specific factors pertaining to cultural customs, which are associated with frequency of human interaction that is related to the subsequent prompt spread of the virus. In addition, traditional habits, close family ties especially with older members, may affect the transmission speed in the community. An additional limitation of the study is that governments differ in the timing of implementing social distancing and lockdown measures, which affected their efficacy. Also, between the enforcement of quarantine policies, changing social response efforts and identified COVID-19 cases there is a latent period, which further obscures the analysis. As a result, not only the application of stringent measures by the government but also the timing of these restrictions was crucial regarding the expansion of COVID-19.

RESULTS AND DISCUSSION

According to the preceding analysis, the equation depicting the factors affecting the total number of detected coronavirus cases in each country has the following form:

Total cases = tests + male population + population density + population aged 65 and over + air transport passengers + $\ln(\text{GDP})$ + average temperature + humidity (1)

Based on the empirical estimations, total COVID-19 cases are affected by tests per million, population density and air passengers transported. It is highlighted that more than 50% of the variance of diagnosed coronavirus cases can be explained by the number of tests used. Therefore, the number of tests variable explains most of the dependent's variation. Based on R-squared change, population density can explain an additional 16.5% of the variance in total documented coronavirus instances (model 2). Air transport passengers carried add a 6.3% in the equation's goodness of fit. It also emerges that tests per million, population density and air passengers carried interpret 74.1% of the variance of verified coronavirus infected patients. Therefore, the three predictors jointly and not individually account for 74.1% of the variance in the dependent variable.

According to their coefficients (0.047, 0.409, 0.637) tests, population density and air transport passengers are in the expected direction, indicating that in a certain country of the studied group, the higher the number of tests per million population is, the higher population density is and the more air transport passengers are carried the higher is the number of total cases and vice versa.

The coefficients of tests, population density and air transport passengers carried are statistically significant ($t_{TESTS} = 7.519$, p = 0.000 < 0.05, $t_{DENS} = 4.062$, p = 0.000 < 0.05 and $t_{AIR} = 2.920$, p = 0.006 < 0.05). Additionally, the constant coefficient is statistically significant as well (t = 2.651, p = 0.000 < 0.05).

Tolerance statistics are high and VIF are low (VIF < 5) for all independent variables, indicating no serious multicollinearity problems (table 2). Conditional index for the last dimension is slightly lower than 15 (14.882 < 15) and Eigenvalue is near 0 but not equal to it, both indicating not serious multicollinearity. Both tests and air passengers variables are associated with high variance proportions in the last dimension.

Taking into consideration the above criteria, it could be concluded that there are not serious multicollinearity problems in the model. Durbin-Watson test did not indicate autocorrelation as d = 1.822> $d_U = 1.74$ and $4 - d = 2.178 > d_U = 1.74$ with explanatory variables K = 3, a = 0.05 and n = 137.

The above mentioned results suggest that the model explaining total COVID-19 cases has a good explanatory performance, the coefficients appear to have statistical as well as demographic and socioeconomic significance and the assumptions for the model approval are satisfied. Therefore, the model is approved indicating the existence of linear dependence of total coronavirus cases per million population on tests, population density and air passengers carried.

According to the preceding analysis, the equation including the factors affecting the total number of deaths occurred due to coronavirus in each country has the following form:

Total deaths =tests + male population + research and development expenditure (% GDP) + population aged 65 and over + $\ln(GDP)$ + death rate + physicians + health expenditure (% GDP) + cigarette consumption + morbidity (2)

Based on the estimations, three variables significantly affect the dependent variable. These namely are tests per million people, population aged 65 and over in addition to male population expressed as percentage of total population. More specifically, it is proved that 75.3% of the variance of coronavirus deaths can be explained by the number of tests used. Based on R-squared change, population aged 65 and over can explain an additional 10% of the variance in total deaths. Tests per million people, population aged 65 and over as well as male population expressed as percentage of total population interpret 94.1% of the variance of verified coronavirus deaths. Therefore, the three predictors jointly and not individually account for 94.1% of the variance in the dependent variable.

In addition, according to the value of Durbin-Watson test autocorrelation problems do not exist. Since F(3,7)=37.281, *p*-value=0 and, as a result, p < .005, the overall regression model is statistically significant. Therefore, when taking these three predictors together as a group (tests per million people, population aged 65 and over as well as male population), the sample data provide sufficient evidence to conclude that the three regression model fits the data better than the model with no independent variables.

Based on the Coefficients' results, tests per million people is a significant predictor of total coronavirus deaths per million people as the p-value equals zero (table 6), which is less than the significance level posed (α =0.05). The same conclusion applies for population aged 65 and over as well as male population, which have p-values equal to 0.004 and 0.029 respectively, which are less than the above-mentioned significance level. As a result, they are also significant predictors of total deaths per million of population. Based on the values of the variance inflation factor (*VIF*), all of which are near 1, collinearity does not affect regression results.

According to the preceding analysis, the equation depicting the factors affecting the total number of recovered patients in each country has the following form:

Recovered = tests + male population + research and development expenditure (% GDP) + population aged 65 and over + ln(GDP) + death rate + physicians + health expenditure (% GDP) + cigarette consumption + morbidity

Based on the estimation results, three variables significantly affect the dependent variable. These namely are tests per million people, the number of employed physicians and *morbidity*. More specifically, empirical results indicate that almost 50% of the variance of recovered coronavirus patients can be explained by the number of tests used. Based on R-squared change, the employment of physicians can explain an additional 22.7% of the variance in total recovered patients. From model 3 emerges that tests per million, physicians and morbidity interpret 81.9% of the variance of recovered patients. Therefore,

the three predictors jointly and not individually account for 81.9% of the variance in the dependent variable. In addition, according to the value of Durbin-Watson test autocorrelation problems do not exist.

The Coefficients' estimates examine each of the predictors individually and, therefore, whether a given variable is significant per se. Therefore, tests per million people is a significant predictor of total recovered coronavirus patients as the p-value equals zero, which is less than the significance level posed (α =0.05). The same conclusion applies for the number of physicians employed and morbidity of patients, which have p-values equal to 0.003 and 0.030 respectively, which are less than the above-mentioned significance level. As a result, they are also significant predictors of total recovered patients. Based on the values of the variance inflation factor (*VIF*), all of which are near 1, collinearity does not affect regression results.

IMPLICATIONS

There is an on-going dialogue concerning socioeconomic and demographic criteria that contribute to the occurring coronavirus effect. In the case of COVID-19 influenza the social nature of prevention and control measures required the active enrollment of society in order to block the contagion effect. In addition, the transmission of the virus at each phase of the epidemic depends on a set of demographic and socioeconomic determinants that govern interactions between individuals.

Socioeconomic conditions in health are ubiquitous affecting life expectancy and mortality. The socioeconomic profile has been established as a potential determinant of infectious diseases as well. Therefore, a plentiful of demographic and socio-economic determinants can explain the extent of COVID-19 even though the spread of the phenomenon is still in progress.

The empirical results of the study indicate that COVID-19 transmission is positively associated with population density, air travel frequency and negatively mediated by the number of tests used, while the effects of the environmental factors are still blurry. A determinant strongly related to registered coronavirus deaths is the number of diagnostic tests used. Two additional predictors are the age of the population and gender as older people and men respectively display greater vulnerability to the mortality of COVID-19.

Based on the preceding analysis, regression results indicate that increased diagnostic capacity via reliable tests for COVID-19 moderates the further spread of the virus. The same applies for the improvement of living conditions captured by the density of population. Moreover, air travel intensity expressing population flows poses a higher contagious risk than other aspects, such as geographic proximity and similar economic environment. Moreover, apart from tests, the existence of medical personnel and the morbidity of population are associated with retrieval of patients with COVID-19. The significance of smoking is probably circumvented by the effect of the morbidity variable as smokers are more likely to have chronic health conditions. Moreover, the correlation between these two variables is high.

Models including only epidemiological variable partially explain variations in the *occurrence* of COVID-19 cases. Therefore, important interpretative variables are being overlooked when studying virus infections. On the contrary, demographic and socioeconomic measures should be studied as well in an effort to break the chain of infection and avoid community transmission.

As a response to the global shock of COVID-19, social protection and social assistance programs should be rapidly scaled up and their coverage extended. Moreover, in order to strengthen public health preparedness and deal with future public health risks, equitable public health prevention measures should be developed, whereas all-embracing access to health care services should be strengthened along with the development of sustainable health systems. As a result, to prevent dispersion through intermediate policy interventions the demographic parameters as well as the socioeconomic setting should be highly regarded in order to advance our knowledge in the field.

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HEALTH MANAGEMENT

THE MULTIFACTORIAL PHENOMENON OF DOPING IN AGES 10 TO 18.

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ABSTRACT

The systematic literature review and the processing of the risk factors associated with the usage of anabolic-androgenic steroid substances for doping at the ages 10-18 is the first step for a holistic understanding of this phenomenon. The impact of these substances' usage is detected on the adolescent's physical and psychological health and their social, educational, interfamilial and personal life. The research of the literature was conducted via worldwide academic research databases such as SCOPUS, ScienceDirect, Umea Library etc. The research results categorize the main risk factors, separated into risk behaviors and personal traits, associated with doping substances usage. Particularly, gender, personality, health attitudes - health behaviors are embedded in individual factors. This contemporary paper highlights risk assessment and attitudes towards the usance of drugs and their consequences. In closing, it is important to record the need for holistic analysis and intervention of the phenomenon in individual, group and community level which highlights the important role of social sciences could play in the interconnection of factors.

KEYWORDS: anabolic androgenic steroids, adolescents, risk behaviors, doping.

PURPOSE

Introduction

Doping is something that has preoccupied the global sports community, and not just the community, for decades. The use of these substances was considered the exclusive "tool" of highly competitive athletes. The phenomenon of the use of anabolic androgenic steroids is evident in children - adolescents, posing immediate risks to the health and development of users (Kindlundh A., et al., 1999). Taking anabolic androgenic steroids is one of the unhealthy behaviors among adolescents; it represents a major threat to public health, with long-term and short-term consequences (Diehl K., Thiel A., Zipfel S., Mayer J., 2012). Androgenic anabolic steroids have been shown to affect mood in a variety of ways, through hormonal disorders that cause them, body and brain development, eating habits, and the use of anabolic steroids has been linked to the use of other substances, such as marijuana and alcohol (Lapota H. B., 2013).

It is widely accepted that doping is not and is not limited to elite sports (Diehl K., et al., 2012). However, it was not until 2012 that the WHO reported that doping posed a major threat to public health since, without any control, high school students (Partnership, 2012), and students could access these substances,

or participate in sports events, or work out in their neighborhood gyms. Doping belongs to the risk behaviors of adolescents and carries immediate risks to the health and development of young users (Vito A. G., 2012) but also to their later adult life (Diehl K., et al., 2012).

Steroids are the substances that usually come to mind when we talk about the phenomenon of doping, but doping involves the use of other substances (such as stimulants, hormones, diuretics, drugs and marijuana), the use of illegal methods (such as transfusions blood and genetic doping), as well as refusing to be tested for substance use or attempting to violate or alter the doping control process (The World Anti-Doping Code, 2020). Anabolic-androgenic steroids are chemicals that create variants of the male testosterone, the sex hormone (Vito A.G., 2012). "Anabolic" means building muscle and "androgenic" means increasing male sexual characteristics (Vito A.G., 2012). "Steroids" represent the class of drugs (Vito A.G., 2012). The use of anabolic steroids can cause changes in mental state and behavioral changes such as irritability, aggression, euphoria, depression, mood swings, impaired libido and psychosis. Steroids can have a negative effect on relationships and continued use of steroids can make users addicted (Vito A.G., 2012). Finally, anabolic users can turn to other drugs to reduce and mitigate the negative effects of steroid use on their body and mental state. The need for the study of doping by the social sciences has been documented in the last decade (Christiansen V. & Gleaves J., 2013). The social sciences can significantly contribute to a better understanding of "who" and "how" (Ahmadi N., Ljungqvist A., Svedsäter G., 2006). The key point that the social sciences differ from all other sciences is the attempt to understand the behavior of substance use by young people (Ahmadi N., Ljungqvist A., Svedsäter G., 2006).

Purpose

The objective collection and investigation of protective and aggravating factors that push young people, athletes and non-athletes aged 10-18 years to use doping substances through six international scientific databases from 1994-2019.

Individual objectives of the study are:

- Investigating the factors that push young people to use doping
- The description of the effects of anabolic steroids on the physical and mental health of young people
- The description of the protective agents against doping
- The comparison of different approaches to the phenomenon of anabolic steroids in young people
- Examine conditions for appropriate interventions and prevention for young people.

RESEARCH METHODS

Systematic reviews are important tools for an objective approach to the literature, synthesis and critical analysis of the results of primary studies, with an excellent contribution to the clarification of issues and the search for new research directions. The sampling process for the review was performed in two stages. Initially, the review was done with a primary assessment of titles and abstracts. Publications that met the research criteria were collected for analysis. The bibliography of the selected articles was also searched and analyzed for other articles. From all the databases, articles were selected that have already been peer-reviewed by the reviewers of the journals according to the sampling criteria and the search terms. In sampling the criteria for exclusion and inclusion of articles extend as follows. Initially, the study participants were children - adolescent athletes aged 10 to 18 years. The criterion was for the articles to focus on the prevalence, causes and consequences of the use of Anabolic Androgenic Steroids (AAS), and the aggravating and protective factors of doping use. Finally, the criterion is the year of publication of the articles from the years 1994 to 2019. Table 1 presents the conditions for seeking inclusion and exclusion of research.

Table 1.	Key terms, search algorithm
1	Child or Children OR Adolescent or Adolescence OR 10-18
2	AND Use of Anabolic Androgenic Steroids OR Doping
3	AND Athletes OR Sports

From the total of six international scientific databases, 2253 articles were initially identified. After removing the duplicate entries of the sources and sorting the articles related to the key terms, 57 articles were recorded. From these, after studying the abstracts, 21 articles were selected. These were briefly identified in the following databases: SCOPUS 6; Science Direct 5; Taylor & Francis Group 3; SAGE Journals 2; Google Scholar 2; Umea University Library 1. After an in-depth analysis, 15 articles were selected that met all the criteria. Figure 1 shows the survey selection process with a flow chart.

Figure 1. Results of the main search:



IS AND DISCUSSION

Table 2: Collection of review results of the electronic basic bibliographic search

	Year	Article Title	Abstract	Theme	Group Focus	Age
ta H. B.	2013	Eating pathology, supplement use, and nutrition knowledge in collegiate athletes	Within the university facilities, athletes appear to be at particularly high risk for pathology of consumption and use of supplements, due to attractive external pressures, the need for optimal performance and the specific characteristics of the sports in which they participate.	Health Problems, Awareness of the situation, Young people's perceptions of doping, Food supplements	Athletes	You and adol
stiansenV. & J.	2013	What do the humanities (really) know about doping? Questions, answers and cross- disciplinary strategies	This article is a continuation of the discussion on the role of the humanities and social sciences in research on drug use in sport.	Social Sciences	Athletes	Gen pop
erink, C. H. et	2007	Social psychological determinants of the use of performance-enhancing drugs by gym users	The aim of this study is to identify the social psychological determinants of substance use that improve performance by 144 bodybuilding or powerlifting gym users.	Personal traits Young people's of doping, Socioeconomic factors, psychosocial factors	Athletes	Gen pop
nsson A. et al.	2011	Anabolic Androgenic Steroids in the General Population: User Characteristics and Associations with Substance Use	The aim of the study is to analyze the correlations of AAS use in the general male population aged 15–64 in Sweden in relation to demographic data, economic status, and education.	Health problems, Gender, Social network and peer association, Socioeconomic factors, psychosocial factors	Non Athletes	Gen pop
l, K. et al.	2012	How healthy is the behaviour of young athletes? A systematic literature review and meta-analyses	Systematic review through the PRISMA Statement to assess the incidence of risky behaviors among athletes in this age group over the past 20 years related to risk behaviors (alcohol consumption, smoking, illicit drug use, unhealthy diet and doping) in adolescent athletes.	Health problems, Gender, Health behaviors, Proactive interventions	Athletes	You
o, J.	2015	High School Athletics: Coaches' Opinions on Performance Enhancing Drugs	The purpose of this study was to determine if there were differences between high school coaches and their views on the classification, testing and punishment of substance use that improves performance by high school athletes.	Social network and peer association	Athletes	You
A. G.	2012	Adolescent steroid use: a logistic regression analysis	This study studies the relationship between peers and low self-control in steroid adolescent use in the 12th grade.	Personality traits Gender Social network and peer association Young people's perception of doping Health behaviors	Non Athletes	Ado

lindsson T. & son, V.	2010	Sport, and use of anabolic-androgenic steroids among Icelandic high school students: a critical test of three perspectives	This study explores the use of AAS among a nationally representative sample of high school students in Iceland as an individual phenomenon driven by the desire to succeed in sport, as rules and values embedded in the social relations of formally organized sport, and as a perspective suggesting non- sporting factors related to the use of other substances.	Gender Social network and peer association Young people's perception of doping Proactive interventions	Non Athletes	Ado
ak J. et al.	2018	Sport motivation and doping in adolescent athletes	This study examines adolescent doping from a perspective with motivational variables in doping behavior in adolescents participating in competitive sports.	Personality traits	Athletes	Ado
cock B. R. & P.	2007	Social capital: implications from an investigation of illegal anabolic steroid networks	Many studies have linked the dimensions of social capital to behaviors that improve health.	Social network and peer association Social capital & doping	Athletes	Gen popt
dlundh A., et	1999	Factors associated with adolescent use of doping agents: anabolic-androgenic steroids	The aim was to assess the importance of risk factors in the use of doping agents in adolescents.	Health problems Gender Health behaviors	Non Athletes	Ado
son S.	2004	Evaluation of a health promotion programme to prevent the misuse of androgenic anabolic steroids among Swedish adolescents	The aim of this study was to design a program to prevent AAS abuse among adolescents.	Proactive interventions	Non Athletes	Ado
olls, A. R. et	2017	Children's First Experience of Taking Anabolic-Androgenic Steroids can Occur before Their 10th Birthday: A Systematic Review Identifying 9 Factors That Predicted Doping among Young People	The purpose of this systematic review was to study the performance-enhancing drugs and their serious and irreversible effects on the health of young people.	Personality traits Social network and peer association Proactive interventions	Non Athletes	Chil teen
F. et al.	2013	The socialization of young cyclists and the culture of doping	The purpose of this article is to understand how the interactions between the actors involved in performance with attitudes towards products and doping methods.	Perceptions about doping	Athletes	You
l K. et al.	2012	Elite Adolescent Athletes' Use of Dietary Supplements: Characteristics, Opinions, and Sources of Supply and Information	The aim was to study the prevalence of dietary supplement use among 1,138 elite adolescent athletes in relation to the use of dietary supplements.	Health problems Young people's perceptions about doping Daily supplements	Athletes	Ado

According to the analysis of the full texts, the main promoters that are aggravating in ages 10-18 in terms of the occurrence and use of doping-related substances were identified. Gender seems to be associated with increased use of anabolic steroids especially in adolescent boys as opposed to adolescent girls (Thorlindsson T., & Halldorsson V., 2010). More specifically boys want to increase their muscle mass based on the standards of the ideal muscular male while at the same time believing that this attracts girls more intensely (Thorlindsson T., & Halldorsson V., 2010). It is also noticed higher consumption of illegal and legal substances in boys than in girls of this age (Diehl K., Thiel A., Zipfel S., Mayer J., 2012).

The personality of children and adolescents also acts as a factor in the use or non-use of illegal or legal substances and in particular doping substances. Patterns, trends and desires of young people influence the use of anabolic steroids (Wiefferink C.H., Detmar S. B., Coumans B., Vogels T., T. G.W. Paulussen, 2007). At the same time, young people with low levels of self-control are more likely to use anabolic steroids (Vito A.G., 2012). While one factor that affects a person's personality is the insecurities of adolescence, more specifically young people tend to use anabolic steroids when they feel insecure about their appearance seeking to compete with and affirm the expectations created by society's standards (Mudrak J., Slepicka P., Slepickov I., 2018). Finally, a considerate factor is that young people with mental health problems are more easily embracing the use of doping substances. For example, young people with suicidal ideation and aggressive behavior are more likely to use anabolic steroids (Nicholls A.R., et al, 2017).

Another factor that was identified was the health problems (health behaviors) that adolescents experience when starting and continuing to use anabolic steroids (Diehl K., Thiel A., Zipfel S., Mayer J., 2012). More specifically, young people who want to change their weight due to standards or observed an inconsistency of ideal weight with their existing weight consumed more dietary supplements, which was positively related to the use of anabolic steroids (Lapota H.B., 2013). Also, the increased use of legal substances such as alcohol and tobacco, but also illegal drugs is associated with the use of anabolic substances and is a problem of adolescent's health (Hakansson, A. et al., (2012).

Continuing an important influence on the choice of young people to take doping substances are the perceptions, false and true, in relation to the results of these substances, on their athletic performance but also on their body (Wiefferink C.H., Detmar S. B., Coumans B., Vogels T., TGW Paulussen, 2007). The use of anabolic steroids in young people and especially in young athletes is considered a rapid mean of achieving the goals that will bring them immediate success (Thorlindsson T., & Halldorsson V., 2010). Also, these perceptions have created a strong culture around doping as something inevitable or something that everyone uses.

Analyzing the choices of young people, a major factor is their life attitudes of adolescence that are shaped by the culture, values, standards, influences of important people in their lives, social capital and the media. Young people with a high level of self-control are less likely to use anabolic steroids (Vito A.G., 2012). Acceptance of deception and more generally delinquent behavior of young people is significantly associated with the use of anabolic steroids (Vito A.G., 2012). These perceptions are crucial to the moral and class satisfaction of adolescents before and measure the use of these substances. Intrinsic motivations of young athletes play an important role in doping behavior (Mudrak J., Slepicka P., Slepickov I., 2018). This factor is connected with the psyche of young people, as well as it acts significantly on their choices. The psyche of young people is considered fragile, especially because adolescence is a period of physical and psychological changes. Trends, patterns and desires influence the use of anabolic steroids (Hakansson, A. et al., 2012).

Moreover, dietary supplements, proteins aimed at muscle growth or diet pills and supplements can also contain androgenic anabolic steroids. Young people combine muscle training and strengthening with the use of dietary supplements aimed at increasing body mass (Lapota H.B., 2013). They do not have enough knowledge about the right way to take dietary supplements. They ignore their effects and often do not know that they are taking an anabolic substance (Diehl K., Thiel A., Zipfel S., Mayer J., 2012). The ideals adopted by young people for the ideal body play a crucial role in the use of steroids and dietary supplements.

Aggravating factors in	Personal Traits
doping use	The patterns, trends and desires of young people influence the use of anabolic steroids (3).
	Young people with low levels of self-control are more likely to use anabolic steroids (7).
	Young people tend to use anabolic steroids when they feel insecure about their appearance, seeking to compete with and affirm the expectations created by society's standards (9).
	Young people with suicidal ideation and aggressive behavior are more likely to use anabolic steroids (13).
	Health Behaviors
	Young people who saw a discrepancy between their ideal weight and their current weight consumed more dietary supplements, which was positively related to the use of anabolic steroids (1, 15).
	The use of substances such as alcohol, drugs and tobacco is associated with the use of anabolic steroids $(4, 5, 11)$.
	Gender
	Boys think gaining muscle mass is more attractive to girls (8).
	Boys are more likely to use and abuse anabolic steroids than girls (7, 8).
	The greater use of anabolic steroids by boys is also associated with the use of harmful substances such as drugs, alcohol and tobacco (4, 5, 11).
Protective factors	Personal Traits
<u>againsi aoping</u>	Young people with high levels of self-esteem, resistance to social pressures and fewer perfectionist behaviors were much less likely to use anabolic steroids (7,13).
	Young people with high levels of self-control are less likely to use anabolic steroids (7).
	Focusing on the inherent enjoyment of sports and self-improvement is negatively related to the use of anabolic steroids (9) .
	Gender
	Girls are less likely to use anabolic steroids (5,7,8, 11).
	Prevention
	Intervention through discussion about the consequences of doping in young people both at group and individual level reduces the chances of occurrence of the phenomenon (8).
	Young people show sensitivity to doping issues and especially to issues of appearance. After discussions and activities with them, they showed enough understanding and changed their attitude and perception (12).
	The social environment around the young athlete and the social pressure he exerts, can be managed through psychological interventions and reduce the prevalence of the phenomenon (13).

Table 3: Thematic analysis of information collected

IMPLICATIONS

In conclusion, prevention programs are one of the factors against the use of AAS (Nilsson, S. et al., 2004). It is emphasized that without proper program design, simple information, without immersion in the reasons why young people want to use anabolic steroids (Nilsson, S. et al., 2004) and without changing the standard bases and values of young people (Thorlindsson T., Halldorsson V., 2010) programs seem to fail (Diehl K., Thiel A., Zipfel S., Mayer J., 2012). That is, the intervention in adolescents is successful when it extends to the group and individual level (Nilsson, S. et al., 2004) with health promotion activities, such as group discussions (Nilsson, S. et al., 2004). It is emphasized that anabolic abuse among adolescents can be reduced with prevention programs that focus on external appearance (Nicholls A. R., et al., 2017) while the correct information on the doping phenomenon is judged necessary in highlighting the negative effects on the health of young athletes (Vito A. G., 2012). It is argued that the knowledge that young people have about AAS does not seem to be reflected in healthy behaviors and control practices (Lapota H.P., 2004) while this knowledge seems to have minimal positive effects in terms of mitigating unhealthy behaviors. The nature of the programs must promote substantial changes in the values and standards of young people (Thorlindsson T., & Halldorsson V., 2010). Concluding the review and the discussion on the present issue, we conclude with the drafting of proposals for future research and successful intervention of the phenomenon. Future research is considered to be fruitful. The focus should be on the effects of AAS use at the ages of 10-18, the biological as well as the psychosocial effects. (Diehl K., Thiel A., Zipfel S., Mayer J., 2012) while at the same time the lack of psychosocial factors intensifies the phenomenon, (Thorlindsson T., & Halldorsson V., 2010) especially when young people do not belong to protective social networks such as family (Kindlundh A., Isacson D., Berglund L. & Nyberg F., 1999). At the same time, future research should focus, in addition to the medical-pharmaceutical part of the misuse - addiction of AAS in young people, on the socio-economic aspect of the phenomenon, as it is documented that the use of AAS intensifies when there are high levels of poverty, lack of family protection network - absence of parental influence (Kindlundh A., Isacson D., Berglund L. & Nyberg F., 1999), inadequate prevention systems and inadequate interventions in public health and education (Sparos L., Dogias E. & Koutra K., 2021). Finally, It is documented that AAS prevention programs achieve their goals and objectives, namely, the reduction of anabolic steroids, with guidelines that highlight trends in appearance trends and patterns between the sexes, including discussions on male behavior and appearance (Sparos L., Dogias E. & Koutra K., 2021).

Acknowledgements

This document would not be possible without the support and cooperation of all the project consortium, the participant clubs (Bulgarian Swimming Federation-; CHF- Shirin Amin; Sport Algés e Dafundo-Pedro Dias; Naoussa Swin Club- Iliana Teligiannidou; Otrè Triathlon Team-Spartaco Greco; Universidad Isabel I- Tania Corrás, Marco Lopez, Anna Münch; Swedish Sports Confederation-Su Oltner; Turkish Sports Foundation- Emir Turam) and the swimmers that have facilitated the information to our data collection process. We truly hope they could find this brief and simple Comprehensive Report interesting, and that this could be one more step on the long fight against doping.

Co-financed program: Erasmus Sport Stop Doping Swim Fair Project 613515-EPP-1-2019-1-BG-SPO-SCP

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HEALTH POLICIES STRENGTHENING ACCOUNTABILITY MECHANISMS IN HEALTHCARE GOVERNANCE IN TIMES OF EMERGENCIES. A HUMAN RIGHTS APPROACH.

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ABSTRACT

The COVID-19 pandemic revealed an urgent need for a more resilient, responsive and sustainable health system governance. Critically, in the face of public health emergencies accountability constitutes a serious vulnerability and a challenge in the governance framework. In fact, this disturbing reality is largely associated with the implementation of weak procurement systems and limited transparency of public finances due to the excessive pressure for prompt state action to contain the health threat, with profound implications for health and human rights more generally. Against this backdrop, this paper seeks to raise awareness on the critical role of accountability in healthcare governance.

KEYWORDS: Human rights, accountability, public health emergencies, corruption, healthcare governance.

PURPOSE

Statement of the problem

The COVID-19 pandemic and the continued efforts to contain its spread worldwide uncovered the urgent need for a more resilient, responsive and sustainable health system governance with accountability to be considered its core component for building public trust on the quality of healthcare, especially during public health emergencies (UN General Assembly, 2020). Undoubtedly, the COVID-19 crisis raised critical questions about the preparedness of health systems for effectively and immediately addressing public health challenges that icopardize public welfare. Admittedly, pandemics always tend to uncover the serious weaknesses of health systems - ranging from the fragmentation and inadequately funding to the lack of investment in good governance, transparency and accountability mechanisms- in terms of effectively responding to a variety of challenges and pressures (UN General Assembly, 2020: paras 13-14). Crucially, earlier in 2015 the World Health Organization sounded the alarm about the fact that in many countries health systems remain underfunded and struggle to deliver even basic health service coverage especially for the poor and disadvantaged, while at the same time being largely affected by corruption (WHO, 2015). Indeed, this reality weighted heavily on the mind of states when many health systems across the world were found to be ill equipped and underprepared for effectively and expeditiously responding to the intensity of the COVID-19 pandemic due to decades of underinvestment compounded by the global financial crisis of 2008 (UN CESCR, 2020). In fact, UN Secretary General António Guterres declared the COVID-19 pandemic as "a time when, more than ever, governments need to be open and transparent, responsive and accountable to the people they are seeking to protect." (UNDP 2020:3)

Hence, the purpose of this paper is to articulate the role that accountability in health system governance can play in emergency responses through a human rights lens. The discussion will first focus on the meaning of accountability in the context of healthcare governance in conjunction with the accountability challenges raised in public health emergency responses. The discussion will then shift to an examination of the extent to which a human rights approach to accountability has the potential to provide a comprehensive tool for addressing challenges and pressures in health system governance during public health emergencies. The findings from this paper can have a broad impact on health law, policies and practices, in that they can be used to evaluate whether there are sufficient regulatory guarantees of accountability in the current laws and policies at country level, and also provide insights for the future development and/ or advancement of domestic accountability frameworks especially when crises threaten health security.

RESEARCH METHODS

The paper is based on a systematic legal analysis of United Nations human rights and regional regimes, literature- scientific research and document analysis. The applied interpretation is in accordance with the treaty interpretation rules as enshrined in the Vienna Convention on the Law of Treaties (VCLT) and particularly in Articles 31 (general rule of interpretation) and 32 (supplementary means of interpretation). The literature-scientific research included publicly available documents, academic articles, reports, peer-reviewed studies and other publications primarily of the World Health Organization and of human rights bodies at the United Nations level (e.g., United Nations Committee on Economic, Social and Cultural Rights, UN Special Rapporteur on the Right to Health), and other grey literature by non-governmental organizations. These sources were published in English and tend to provide useful interpretation material for the role that accountability can play in public health emergency responses through a human rights lens. Essentially, such sources provide further clarification on the content and process of accountability in health domain by using rights-based approaches to health governance and determine what steps are required for holding state and other relevant actors (i.e. duty-bearers) accountable in the event of violations. All in all, the sources of information were acquired by means of extensive and detailed library and digital research.

RESULTS AND DISCUSSION

Accountability a human rights priority and a challenge

Nowadays, it is widely acknowledged that accountability constitutes a long-standing requirement in health system governance and more generally, a central and complex feature of human rights (WHO, 2017; Potts, 2008). At this stage, it is essential to elucidate what accountability exactly encompasses as its efficient deployment in health system governance is at the forefront of this paper's analysis and findings. Arguably, while the existing definitions of accountability may vary, accountability can be broadly conceptualized as a "continuing concern for checks and oversight, for surveillance and institutional constraints on the exercise of power" (Schedler, 1999: 13). Within health care domain, Potts (2008) in a comprehensive report on the right to health accountability affirms that accountability is a broad process, requiring officials - responsible actors in healthcare governance (i.e. duty-bearers) to show, explain and justify how they have discharged their health obligations and take responsibility for the outcomes. In particular, it is asserted that an effective accountability process entails four essential procedural elements in health-related decision-making, implementation and evaluation of health laws and policies: monitoring, accountability mechanisms, remedies and participation (Potts, 2008; Yamin, 2008; WHO, 2019). In a similar vein, Hunt and Backman (2008) argue that institutional and systematic accountability is connected to effective monitoring. Meanwhile, accountability mechanisms, the procedure through which officials are answerable for their acts or omissions, can be judicial (e.g., judicial review of executive acts or omissions), quasi-judicial (e.g., national human rights institutions), administrative (e.g., human rights impact assessments), political (e.g., parliamentary review) and/or social (e.g., involvement of civil society) (Potts, 2008).

Crucially, existing accountability safeguards in health system governance can be challenged and/or disregarded by emergency responses (UN Department of Economic and Social Affairs, 2020). This is especially important as the lack or weakness of accountability frameworks tends to erode public trust as well as to increase corruption risks with adverse implications on the effectiveness of emergency management decisions as well as on health and human rights, more generally (O'Malley et al., 2009; UN General Assembly 2020: para 29). Admittedly, since the beginning of the global public health crisis owed to the COVID-19 outbreak, serious concerns have been voiced regarding the limited role that accountability is playing in healthcare governance and particularly in ensuring the right to health (care) for all during the Covid-19 pandemic, despite its increasing recognition as a fundamental component of

human rights (UN General Assembly 2020; UN General Assembly 2008: para. 8). Such concerns are especially prominent in countries whose health systems governance is confronted with systemic weaknesses (UN General Assembly, 2020; UN General Assembly, 2008; WHO, 2017). As is well established, in several countries health systems are particularly vulnerable to corruption risks in times of emergencies related, inter alia, to: (i) emergency funding and rapid procurement, (ii) overpricing and resale of pilfered supplies on the grey and black markets and (iii) purchasing of substandard or/ and falsified products (UN Department of Economic and Social Affairs, 2020). In fact, there is growing evidence of serious corruption trends in the health sector during COVID-19 pandemic in many countries which may undermine the health and well-being of the population by failing to provide benefits to all people, especially those most in need, and further reduce public trust in crisis times (Steingrüber et al. 2020). For instance, in the UK a senior procurement official for the National Health Service was reported to have sold Personal Protective Equipment for private gain (Kohler and Wright, 2020), while in Italy the immediate situation due to the Covid-19 spread resulted in the simplification of procurement rules relaxed checks and balances- for the rapid purchase of medical masks (Steingrüber et al. 2020). Thereto, it becomes evident that accountability constitutes a significant component for building a resilient health system governance, especially in times of health emergencies, and it must be front and center on every country's health system governance. This essential development can help ensure that resources made available for emergency assistance are not squandered by maladministration, while state and other relevant actors (i.e. duty-bearers) can be held accountable in the event of integrity violations.

As previously acknowledged, realizing the full potential of accountability within health care domain often remains an elusive goal. Starting with the UN human rights framework, the discussion will now shift to the brief examination of the extent to which a human rights approach to accountability has the potential to provide a comprehensive tool for addressing challenges and pressures in health system governance during public health emergencies. At the core of this paper's analysis lies the right to health, a human right well-embedded in treaty texts, pursuant to which states have the primary and ultimate responsibility over the design, delivery and regulation of health system governance. Within this context, the 1966 International Covenant on Economic, Social and Cultural Rights (ICESCR) - the first international legal instrument that recognizes health as a right- stipulates in Article 12 read in conjunction with Article 2 para. 1 that states are obliged to progressively take steps towards, inter alia, "the prevention, treatment and control of epidemic, endemic, occupational and other diseases." Obviously, under this provision, the state's human rights obligation to take measures to combat epidemic diseases is explicitly acknowledged (Toebes et al. 2020).

Notably, in its General Comment No. 14 the UN Committee on Economic, Social and Cultural Rights (henceforth: CESCR), the oversight body for the International Covenant on Economic, Social and Cultural Rights, has drawn attention to the importance of accountability for upholding the right to health for all at all times (UN CESCR, 2000). Interestingly, the understanding and strengthening of accountability in health is rooted in the right to health framework which constitutes a comprehensive and valuable normative framework for accountability (WHO, 2019). Accordingly, the CESCR has explicitly underscored in its General Comment No. 14 that states have a duty to promote transparency and establish accountability mechanisms that allow civil society participation in decisions associated with the realization of the right to health (UN CESCR, 2000). Essentially, accountability mechanisms (e.g., health sector reviews, patients' rights bodies, national human rights institutions, and courts) are crucial procedural elements in health-related decision-making, implementation, monitoring and evaluation of policies in the health sector (WHO, 2017; Yamin, 2008; Potts, 2008; UN CESCR, 2000: paras. 34, 43(f), 54, 55 and 59). Moreover, the Committee has particularly emphasized 'the right to seek, receive and impart information and ideas concerning health issues' in terms of information accessibility, which constitutes a prerequisite of accountability (UN CESCR, 2000; Potts, 2008).

Meanwhile, over the years the consecutive Special Rapporteurs on the Right to Health have also underlined the crucial role of accountability on a number of occasions. Crucially, during the COVID-19 pandemic, the Special Rapporteur emphasized the urgent need for state and non-state actors to adhere to accountability for mitigating corruption trends and risks and for ensuring an effective response to the pandemic (UN General Assembly, 2020). Nonetheless, prior to the COVID-19 pandemic, the Special Rapporteur on the Right to Health, Paul Hunt, has also highlighted in his report that "without accountability, human rights can become no more than window-dressing" (UN General Assembly 2008: para 8). Interestingly, the Special Rapporteur went even further by specifying that health system governance requires a number of effective, transparent, accessible and independent accountability mechanisms to be established by the State (UN General Assembly 2008: para 11). At the same time, the Special Rapporteur acknowledged that human rights accountability is much broader, in that it is also concerned with ensuring that health systems are enhancing, and the right to health is being progressively realized, for all, including disadvantaged individuals, communities and populations (UN General Assembly 2008: para 12). In fact, in a comprehensive report on health sector corruption, the Special Rapporteur on the right to health held that "health systems are complex and a wide range of monitoring and review processes have a role to play in enhancing accountability for the right to health in the context of corruption. In terms of monitoring, budget monitoring, effective and accurate accounting, audits and public expenditure tracking surveys are ways of monitoring how funds have been allocated and whether they have been distributed as intended, or whether corruption may have occurred" (UN General Assembly 2017: para 52). Notably, the Special Rapporteur made the further point that transparency and access to information on decision-making processes, budgets and financial transfers in both the public and private sectors, develop the conditions necessary for the strengthening of accountability for the right to health (UN General Assembly 2017: para. 51).

Meanwhile, at this point it is essential to mention that the UN Convention against Corruption (henceforth: UNCAC) is particularly relevant in this context. Article 5 para 3 of the UNCAC stipulates that states parties shall "endeavour to periodically evaluate relevant legal instruments and administrative measures with a view to determining their adequacy to prevent and fight corruption". Additionally, Article 9 para 2 of the UNCAC explicitly mandates states parties to "take appropriate measures to promote transparency and accountability in the management of public finances [which] shall encompass, inter alia: ... (c) A system of accounting and auditing standards, and related oversight; (d) Effective and efficient systems of risk management and internal control ...". At the same time, in addition to the UNCAC, at the regional level, namely at the Council of Europe (henceforth: CoE) level, accountability is also implicitly the subject of consideration in the Criminal Law and Civil Law Conventions on Corruption. These two CoE conventions require states to develop and implement effective legislative and other measures to tackle corruption and together with the UNCAC can guide states to establish a robust anti-corruption framework for driving accountability for the right to health. Importantly, in light of the aforementioned provisions, it must be conceded that in emergency responses states should ensure that emergency measures are accompanied by adequate auditing, oversight, accountability and reporting mechanisms to ensure that those in need receive the required care, while preventing and mitigating corruption (UNDP, 2020). Health system corruption is less likely when health system governance is ruled by strong accountability mechanisms and there is broad adherence to the rule of law, transparency and trust (Savedoff and Hussmann, 2006: 4). All in all, international (human rights) and regional instruments are increasingly standard setting in a healthcare context against which health system governance and its preparedness for future pandemic outbreaks can be effectively regulated, monitored and assessed. In essence, accountability mechanisms prescribe an overarching operational framework primarily directed to state action, which places the protection and promotion of health rights at the center of health system governance at all times.

IMPLICATIONS

Looking Forward

Undoubtedly, accountability constitutes a multi-faceted process, which involves mechanisms that lead to the enforcement of access to health care entitlements as well as to the regulation of the conduct of executive branches within health care domain (Toebes, 2015). Essentially, the pandemic may constitute a real opportunity to revisit existing accountability safeguards in health care governance in terms of strengthening accountability mechanisms so as to ensure the right to health (care) for all especially during public health crises, while avoiding corruption and unethical practices at all times. From the preceding analysis it is plausible to discern that comprehensive health systems responses at all times and most importantly in emergency times like COVID-19 pandemic, that poses an immediate threat to human life and welfare, require, inter alia, strong accountability mechanisms to be in place, so as decision-makers must always be held accountable (UN General Assembly 2020: para 8). Admittedly, the implementation of strong accountability mechanisms in health care domain has the potential to promote and reinforce efforts for holding state and other relevant actors (i.e. duty-bearers) accountable in the event of violations, while at the same time avoiding any misallocation of funds and achieving effective health system governance at all times, including in emergency responses, to the benefit of the entire population. Looking forward, it must be conceded that an emergency situation due to extraordinary infectious disease outbreaks, like the COVID-19 pandemic that poses a global and an immediate public health risk, cannot be seen as a blank cheque for state and other relevant actors to do as they please. Public health emergencies cannot serve as a pretext for not realizing the full potential of accountability and entrenching unethical practices in health system governance. On the contrary, at all times, it is critical to hold decision-makers accountable for harm caused to the effective realization of the right to health.

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- * This research is co-financed by Greece and the European Union (European Social Fund- ESF) through the Operational Programme «Human Resources Development, Education and Lifelong Learning» in the context of the project "Reinforcement of Postdoctoral Researchers - 2nd Cycle" (MIS-5033021), implemented by the State Scholarships Foundation (IKY).



THE PROMOTION OF GENERIC DRUGS IN GREEK PUBLIC HOSPITALS DURING COVID-19 HEALTH AND PHARMACEUTICAL CRISIS

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ABSTRACT

The outbreak of the Covid-19 pandemic has forced the global community to deal with issues associated with the pharmaceutical supply chain (Farmer, 2021). The aim of the research was to investigate the promotion of generic drugs to public Greek hospitals during a health and pharmaceutical crisis. The findings indicate that generic substitution will contribute to the overall cost-effective health management of the respective disease, and in most cases, the difference in price between generic and original drugs is so significant that doctors usually prescribe a generic drug. Findings are essential for policy makers as guidance towards an efficient promotional strategy planning for generic drugs during health and pharmaceutical crisis as Covid-19.

KEYWORDS: Generic drugs, Health cost management, Pharmaceutical crisis management, Covid-19.

INTRODUCTION

Drugs and health care are vitally important elements of health care systems due to their major contribution to the enhancement of the public health and the improvement of the life standards of citizens (IOBE, 2013). The term drug includes not only the active substance but also the pharmaceutical product under the specific brand name of the pharmaceutical company (Tsiftsoglou, 2004). Specifically, pharmaceutical products contain a group of substances called drug mediums, that have no healing effect but contribute to the figuration, the absorption and the bio-availability of the active substance, which is defined as the quantity of the drug coming into the systemic circulation.

Drugs fall into two categories, the originals and the generics (SEV, 2011). The original drugs are those whose active substance is protected by a National or European Patent(According to the Ministerial decision no $\Delta Y \Gamma_3(\alpha)/o_{10}$ (33013/29.3.2012 of 2012, FEK B' 983/30-03-2012.). The original drugs are also called reference drugs under protection (on patent) during the period that the patent is valid and as reference drugs out of protection (off patent) when the patent is invalid. In Greece, the National Organization of Medicines (NOM) is the body responsible for the circulation license of drugs, carrying out controls and clinical tests during production and monitoring the safety and efficacy of the drugs after their circulation (NOM, n.d.). In Europe, the body permitting the circulation of the originals and their administration to the patients is the European Medicine Agency, EMA. In order to get a circulation permit for a drug, the pharmaceutical company producing the original drug has to file a request based on the results of many clinical tests and, after being granted permission, they can exclusively distribute a drug as it is protected by a patent (EMA, 2016). The duration of the validity of this patent is about ten years starting from the date of the first authorization. When this decade expires, the pharmaceutical company can get an extension of the time span of the patent if the drug is under clinical testing to find a new therapeutic action. In United States of America, the patent is protected for about seventeen years from the date testing begins and the authorization is issued by the Food and Drug Administration (FDA) (Conti, Padula & Larson, 2016).

Generic drugs(According to the Guidance 2001/83/EKof the European Parliament and of the Council of 6 November 2001 on the Community code relating to medicinal products for human use.) are those contain the same amounts of active substance in quality and quantity, the same drug form as the original drug and proof of bio-equivalence to the original through bio-availability studies. It may contain salts or products of the active substance from the original drug which, however, must fall under the same safety and efficacy standards. Generic drugs can remain in the market after the patent expires, which is the reality in Europe as well as in USA. In order to get a permission from FDA and EMA, the pharmaceutical company producing the generic drug is not required to present results from clinical studies. It is, however, required to prove that the drug contains the same active substances, in the same amount and efficacy, that it is a bio-equivalent to the original drug and that the production is based on the same standards (Straka, Keohane & Liu, 2017). Therefore, generics compared to the originals have the same qualitative and quantitative composition regarding the active substances, they are in the same drug form and they are bio-equivalent, which can be proven through bio-availability studies (Nemeth, Szigeti & Pusztai, 2015).

Drugs and the drug market in general display some particular characteristics. First of all, the drug market is characterized by asymmetry in information, as in order a patient to be provided with a pharmaceutical product, a doctor needs to prescribe it and the pharmacist to mediate but the participants usually lack of information (Begg, Fischer & Dombush, 2006). Furthermore, the asymmetry in information may lead to the provoked demand phenomenon (an increase in the demand for a specific drug), as the doctor may choose a more expensive therapy when there is a cheaper one (Petrelis, 2019). What is more, the cost is covered by the social insurance funds, which affects the amount a patient has to pay which may lead to the "moral hazard" phenomenon (situations that are morally ambiguous). As a result, the patients pay a smaller amount than the drug's actual price and may thus take more drugs than they would have if they do not have the insurance coverage (Zweifel & Manning, 2000). Finally, when it comes to demand, the pharmaceutical market has monopoly privileges in the original drugs market in contrast with the pluralism evident in the generics' market. This can be explained by the protection of the patents, the high cost of investment in Research and Development (R&D), the attachment to the trade mark, even after the patent period of the reference drug has expired, and the strict requirements involved in granting the drug permission (Kiriopoulos & Athanasakis, 2012).

THE COVID-19 ERA

International community is affected by the economic crisis of the last decade. All sectors have been facing difficulties and especially the health sector. Since 2009, Greece has entered the economic depression which resulted in a tremendous rise in unemployment rates. The depression led to the public expenditure cutback in all sectors, due to the reduction of the overall budget. In 2010 Greece formed a national funding plan with the European Commission under the condition that the country will implement specific changes. Among those changes was the reduction of the public health expenses, which traditionally in Greece were very high compared to its financial situation (European Commission, 2010). However, the reduction of the citizens' income and the economic crisis led to increased demand for public health services covered by their insurance provider. This fact further burdened the Greek health system, causing problems in the responsiveness and the quality of health services. For these reasons, it is of vital importance to sensibly fund the health care system, to effectively distribute the resources, fortify the primary healthcare and impose a system assessment for the monitoring of the quality of offered services and personnel operation (Banousi et al., 2014).

Today, along with the impact of the economic crisis, the international community is forced to face a huge health care crisis, the Covid-19 pandemic, as was announced by WHO on March 11th, 2020 (Asselah et al., 2021). This situation made the present drug shortage, which was created by the globalization and the transference of the pharmaceutical industry in low- and middle-income countries such as China and India, even worse (Farmer, 2021). Actually, the particular circumstances reduced the production cost but increased the quality issues that led to revocation of pharmaceutical products and the appearance of drug shortages in the private as much as the public sector.

The development of vaccines, which are considered the most effective therapeutic means against viral infections, such as the Covid-19 disease, requires much time until their release is permitted and the total of the population is vaccinated (Zhang & Zhong, 2020). Therefore, until the total vaccination of the society against Covid-19, the main objective of all governments is the provision of drugs that are effective

against the virus (Asselah et al., 2021). To this end, scientists try to redefine already known drugs (drug repurposing/ repositioning). This technique involves finding new therapeutic indications regarding the infection of Covid-19 in drugs that are already permitted and it is superior to the invention of new pharmaceutical molecules, as these drugs have been proven safe (Daughton, 2020). Moreover, the cost and time required for their administration to the patients is reduced, as the pre-clinical tests, safety and toxicity controls have already been carried out. This technique has already been used in the past by the original drugs production pharmaceutical companies in order to expand the validity span of the patent. Of course, this has also negative implications for the drug availability, as with the patent protection the producing company dominates the market with its exclusivity and shortages are created among several countries (Trivedi, Mohan & Byrareddy, 2020). Actually FDA, in order to protect the public, supports and gives permission to independent organizations to search for new therapeutic indications on drugs apart from those suggested by the original drug's producing company.

For the Covid-19 infection therapy, it is important to have available a low-cost drug, so that the whole population can be catered for. The cost of therapy by "repurposed" generic drugs is affordable by all countries as opposed to the originals. Specifically, if the drugs that are controlled for action repurposing have positive results, the cost of a patient's therapy is estimated between1\$ and 29\$, under the condition that the generic drugs that are used, are produced at very low prices. Moreover, the production companies of generics still have profit, despite the low cost, since mass production goes beyond the local level (Hill et al.,2020). Mass production also contributes to the decrease of drug shortages found in countries that do not produce the particular drugs. Additionally, if the cost of the drugs selected for the treatment of Covid-19 is very high, then their accessibility for all patients is reduced (Pepperrell et al., 2020). Therefore, this study focuses on the generic drugs administration by the doctors of public hospitals in Greece during the Covid-19 pandemic and it examines the reasons why the generics have low occurrence in Greek hospitals, as well as what the financial benefits from their use are.

PURPOSE

The purpose of the survey is to look into the administration of generic drugs by the doctors of a public hospital during the economic crisis and the Covid-19 pandemic. The research questions of the survey that are attempted to be answered are the following:

1) Which factors affect the prescribing behavior of public hospital doctors?

2) How do public hospital doctors respond to the economic impact of the generic drug use?

3) What is the standard knowledge of the public hospital doctors regarding generic drugs?

4) How do public hospital doctors perceive the policy implemented by the Greek health system with regard to the promotion/administration of generic drugs?

5) How frequent generic drugs are prescribed by the public hospital doctors?

6) To what extent, the doctors of public hospitals trust the Greek and European drug regulatory authority regarding pharmacovigilance?

RESEARCH METHODS

The type of survey carried out is the quantitative research. The collection of data was primarily carried out through structured questionnaire with closed type questions. The survey was carried off in the General Hospital of Edessa and lasted for 3 months. The sample of the survey consists of all the doctors (interns and specialists) of the Hospital of Edessa who are qualified to prescribe drugs. The number of doctors in the hospital were 60 and from those 54 doctors agreed to participate in the survey (90% respond rate), 32 of whom were men and 22 women. The majority of the participants, reaching a number of 55,6%, are aged between 25 and 44. Regarding the working experience 38,9% of them have professional experience ranging from 1 to 5 years and around one third of them (27,8%) have more than 20 years of experience. Also, 64,8% of the participants are specialist physicians, with one third of them (20,4%) being pathologists. Finally, 77,8% of the participants hold a medical degree and only 3,7% have a PhD (Table 1). The entry and statistical processing of the survey data were carried out with the Statistical Package for the Social Sciences (SPSS, v.21).

Table 1: Demographic information

		%
Sex	Man	59,3
	Woman	40,7
Age	25-29	18,5
	30 - 34	16,7
	35 - 39	7,4
	40 - 44	13,0
	45 - 49	13,0
	50 - 54	11,1
	55 - 59	11,1
	60+	9,3
Practicing	1-5	38,9
years	6-10	11,1
	11 - 15	11,1
	16-20	11,1
	20+	27,8
Position in	Specialist doctor	64,8
health unit	Intern doctor	35,2
Education	Medical degree	77,8
	Master	18,5
	Doctorate	3,7

The questionnaire constitutes the tool of this survey and participation was anonymous. The demographic information required aimed only to the statistical data collection and are under personal data protection as well as total discretion and confidentiality. Regarding the answers, a Likert type scale with five point was used. Before handing out the questionnaire a pilot survey was carried out in a small number of doctors in order to ascertain that the questionnaire is correct, clear and functional. The questionnaire was based on the studies of Labiris et al., (2015) and Theodorou et al., (2009). The questionnaire of the present survey has seven sections, which are: a) demographic information, b) basic knowledge on generic drugs, c) factors affecting doctors' behavior in prescription and sources of information, d) the doctors' attitude towards prescribing generic drugs, e) the doctors' attitude towards pharmacovigilance and the Greek regulatory authority, f) the financial impact of the generic drugs use and g) the doctors' attitude towards the measures for the mandatory substitution with generic drugs applying in the Greek pharmaceutical market. Finally, the questionnaire reliability was tested through Cronbach's alpha factor and the findings indicate high reliability of all scales.

RESULTS AND DISCUSSION

The analysis of the results of the present censor survey leads to conclusions regarding the promotion of generic drugs by the doctors of the public hospital of Edessa. The majority of doctors thinks that generic and original drugs have the same active substance and that they are therapeutic equivalents. Half of them claim that they have the same safety profile, while there are doubts about the production standards. Furthermore, the major criterion for the selection of a drug is considered to be the proven clinical efficacy. Combining the above answers with the question for the generic drugs prescription frequency instead of the originals, it is indicated that the doctors do not fully trust the characteristics of the generic drugs concerning their production and lead to clinical efficacy and, for that reason, they avoid prescribing them frequently. This fact is confirmed also by the lack of trust in the Greek regulatory authority, (NOM), regarding the regulation of production practices in the market of the generics.

Moreover, less than half of doctors agree that the substitution with generics can be done in life threatening diseases or at a late stage, while about 1/3 accepts the substitution with generics in cases of imminent irreversible damage. The above low rates point to the little trust the doctors show to generic drugs and the little preference in the generics prescription at a rate of 14,8%. Actually 42,6% of doctors prefer prescribing active substances, either in compliance with the regulations imposed by the government on prescription, or because they avoid making the choice between original and generic. In the other end, the

doctors seem cautious regarding the generics' safety, the majority of them do not attempt to reexamine the cases, and they do not consider the prescription of further tests necessary when they administer generic drugs. Furthermore, the majority of doctors take the cost of the prescribed drugs into consideration and reckon that the substitution with generics contributes to the financially effective treatment of the disease in question.

Another important finding of the survey concerns measures imposed on the mandatory substitution with generics drugs. Less than 1/5 of doctors support this policy by the Greek authorities, while the majority disagree or keep a neutral position. Finally, the comparison of demographic information leads to important conclusions. More female than male doctors seem to agree with the fact that there is a financial impact from the use of generic drugs and that their cost affects the selection of drugs [t(52)=-2,887, p=0,006] (Table 2).

Table 2: T-test control regarding the views of men and women on the generic drugs

	Gender	Μ	SD	t	df	р
Financial	Male	17,65	3,34	-2.887	52	0.006
Impact	Female	20,59	4,10	_,007		0,000

Moreover, according to the findings, specialist doctors trust at greater extent the Greek and European authority on drug vigilance issues regarding the supervision, control and elimination of illegal practices, effectiveness and safety of pharmaceutical products. Similarly, conclusions are reached through the comparison of doctors regarding their professional experience. Doctors with experience of more than 16 years trust the authorities on drug vigilance issues more than younger doctors with 1-5 years of experience [F (4, 49) = 2,741, p= 0,039]. The last two conclusions are interrelated, as the new doctors working for 1-5 years are usually at the stage of their internship. Moreover, doctors of older age trust the generic drugs and think that they facilitate their patients' compliance, which supports their trust on generics' characteristics and the Greek regulatory authority. Finally, the findings indicate that there are statistically significant differences on respondents' opinion regarding the age group they belong. Specifically, the respondents over 50 years old state at greater extent that substitution with generic drugs facilitates their patients' compliance (M = 2.94, SD = 1.19), that the Greek drug regulatory authority is able to deal with any inappropriate behavior in the market of generic drugs (e.g. production, marketing) (M = 3.41, SD = 1.17), and that the Greek drug regulatory authority is able to identify and withdraw generics with insufficient effectiveness and safety (M = 3.88, SD = .993), as well as they more frequently prescribe a generic instead of an original drug (M = 3.41, SD = .870) (Table 3).

Table 3: Results by age group

					95% Co	nfidence
					Interval	for Mean
					Lower	Upper
		М	SD	SE	Bound	Bound
Substitution with generic drugs facilitates	25-49	2.30	.909	.149	1.99	2.60
my patients' compliance.	50-60+	2.94	1.197	.290	2.33	3.56
	Total	2.50	1.042	.142	2.22	2.78
Frequency of prescribing a generic instead	25-49	2.86	.855	.141	2.58	3.15
of an original drug	50-60+	3.41	.870	.211	2.96	3.86
	Total	3.04	.889	.121	2.79	3.28
The Greek drug regulatory authority is able	25-49	2.49	.901	.148	2.19	2.79
to deal with any inappropriate behavior in	50-60+	3.41	1.176	.285	2.81	4.02
the market of generic drugs (e.g. production, marketing)	Total	2.78	1.076	.146	2.48	3.07
The Greek drug regulatory authority is able	25-49	3.16	1.143	.188	2.78	3.54
to identify and withdraw generics with	50-60+	3.88	.993	.241	3.37	4.39
insufficient effectiveness and safety	Total	3.39	1.140	.155	3.08	3.70

Furthermore, those differences on respondents' opinions about generic drugs found to be statistically significant between the age groups (p < 0.05) (Table 4).

		Sum of		Mean		
		Squares	df	Square	F	р
Substitution with generic drugs facilitates	Between Groups	4.829	1	4.829	4.768	.034
my patients' compliance.	Within Groups	52.671	52	1.013		
	Total	57.500	53			
Frequency of prescribing a generic	Between Groups	3.484	1	3.484	4.713	.035
instead of an original drug	Within Groups	38.442	52	.739		
	Total	41.926	53			
The Greek drug regulatory authority is	Between Groups	9.972	1	9.972	10.097	.003
able to deal with any inappropriate	Within Groups	51.361	52	.988		
behavior in the market of generic drugs	Total	61.333	53			
(eg production, marketing)						
The Greek drug regulatory authority is	Between Groups	6.042	1	6.042	5.003	.030
able to identify and withdraw generics	Within Groups	62.792	52	1.208		
with insufficient effectiveness and safety	Total	68.833	53			

Table 4: ANOVA on age comparisons

The table below displays the similarities and differences between the present survey and those of Labiris et al., (2015) and Theodorou et al., (2009), which were used for thecreation of the questionnaire (Table 5).

Facts of the present survey	Similarities with other surveys
The majority believes that generics and originals are	Theodorou et al., 2009, Greece.
therapeutic equivalents.	
94,4% of the doctors consider proven clinic efficacy	Theodorou et al., 2009, Greece & Cyprus.
to be the major criterion in the selection of a drug.	
The cost of a drug is considered to be important by	Theodorou et al., 2009, Greece & Cyprus.
the doctors when selecting the drugs they are	
prescribing.	
Only 1/5 of the population accepts that the Greek regulatory authority of drugs is capable of dealing with any misconduct in the market of the generic drugs (e.g. production, marketing).	<i>Labiris et al., 2015, Greece</i> : The doctors are skeptical towards the pharmacovigilance measures of the Greek authorities.
About 50% believe that the Greek regulatory authority of drugs is capable of identifying and withdrawing generics with insufficient efficacy and safety.	<i>Labiris et al., 2015, Greece:</i> The doctors are skeptical towards the pharmacovigilance measures of the Greek authorities.
Facts of the present survey	Differences with other surveys

 Table 5: Similarities and differences between the findings of this survey and its predecessors

About 50% accept that the generics and the originals have the same safety profile.	Theodorou et al., 2009, Greece & Cyprus: The majority finds the generics' safety acceptable.
The doctors hold a neutral to positive attitude in the use of generics in life threatening diseases or in cases of imminent irreversible functional damage.	<i>Labiris et al., 2015, Greece:</i> They consider the generics insufficient for clinical action in life threatening diseases, or in cases of imminent irreversible functional damage.

Specifically, several similarities found between the findings of the present study and the previous studies. However, there are also some contractive findings such as the use of generic drugs for clinical action in life threatening diseases, or in cases of imminent irreversible functional damage.

Research findings and literature review indicate that generic drugs' consumption and the amount of generics in the Greek market are still at low levels and there are many techniques that can be used in order to integrate the use of generics into the Greek health system. Most of the techniques aim at the doctor's potential behavior. Doctors, through the electronic prescription decide on the type as well as the cost of the treatment to be followed. For this reason, most of the doctors' motives in generic prescription are financial. Financial rewards and accompanied penalties for those who exceed the acceptable rates of original drugs prescription can be applied. Another technique may be the formation of closed budgets for prescriptions. In order to remain within the limits of the budget, while at the same time they serve their patients and increase their patient list, doctors will have to select the cheaper generics instead of the most expensive originals.

However, additional to all the regulations, it is of vital importance to create educational ground and associate culture that are connected to the use of generic drugs. Carrying out conferences or educational seminars in order to inform the doctors about the safety and efficacy of the generics, can help to increase the trust in generics. Also, the training of doctors regarding the equivalence of the generics with the originals and the proof of efficacy and therapeutic value in the Medical schools of the country will familiarize the doctors with their use. Moreover, through education, doctors will build more self-confidence in informing the patients about the correct use of generic drugs (Godman et al., 2010). An additional important element in the promotion of generics in Greece is the support of the Greek drug industry from a financial point of view, as well as a scientific one. Greek companies need financial support in order to increase their production. As a result, they will be able to avoid potential future shortages of their drugs in the market and create loyal clients due to this sufficiency, as well as to establish a firm position in the international pharmaceutical market. Moreover, the evolution of the professional knowledge of the pharmaceutical companies will contribute to a safer production of higher quality, the promotion of which will fortify even more the trust of doctors and patients in them (Braoudaki et al., 2018).

Finally, the contribution of the regulatory authorities of the country who apply all the necessary controls before and after the release permission of the generics is of vital importance. This fact can also be explained by the low rate (22,2%) of doctors who trust the Greek regulatory authority to recognize and rectify any improper behavior in the production, market release and administration of the pharmaceutical products in the Greek market. The procedures must be carried out by NOM with strictness and total transparency, in order to create a trusting relationship between the authorities and the doctors. The Covid-19 pandemic does not recognize nationalities and borders. It spreads everywhere and that's the reason there should be a spirit of cooperation between the countries and the pharmaceutical companies, so as to set aside any bureaucratic problems and legislatures that hinder the provisional drug chain (Zhang & Zhong, 2020). The final goal is to create a financially efficient health system with effective health benefits.

IMPLICATIONS

A future survey and further research on factors affecting generic drug promotion extended to doctors of other hospitals, is recommended aiming to the verification and enhancement of the findings that appeared neutral in the present survey. The purpose of this proposal is to detect all the factors that make the generic drug promotion more difficult in the hospitals of the National Health System and make the associate suggestions for improvement as well as to establish a financial efficient health system with effective health services.

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HUMAN RESOURCES MANAGEMENT

TELEWORKING IN HEALTH AND WELFARE UNITS DURING THE COVID-19 ERA.

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ABSTRACT

The year 2020 changed the world economy and the world of work in an unprecedented way. Since the outbreak of the Covid-19 pandemic, working from home has become the norm for millions of workers around the world. The current research focuses on the benefits and challenges of teleworking in the teleworkable / administrative sectors of greek health and welfare units, in order to turn the above-mentioned challenges into opportunities for organizations, companies, employees and society as well.

KEYWORDS: Teleworking in health and welfare units, pandemic, work stress, job dissatisfaction.

PURPOSE

<u>Objective of this article</u>: In this article, important positive points and challenges related to the teleworking phenomenon are presented. By the end of this article, the reader will be able to appreciate the importance of teleworking through its application in administrative departments of health and welfare units in Greece. Teleworking -after application in many public and private services- seems to be extremely useful for all parties (i.e. employees, organizations, companies, clients), as long as some administrative services can operate at 100% of their potential, under any pandemic or emergency condition.

<u>Research question</u>: What are the benefits and challenges of Teleworking in Health and Welfare Units during the Covid-19 Pandemic Era?

RESEARCH METHODS

The research was designed for employees working in teleworkable / administrative sectors of greek health and welfare units.

The important features of this research are the following:

• <u>Sampling technique and data collection procedures</u>:

Questionnaire in the greek language (the question and answers were translated by the author of this paper). The link for the questionnaire is the following:

https://docs.google.com/forms/d/1_N4j0SzWdElgZuH9gvLRJIRMhkklSd5wOdIcJ_x2yw/edit#responses

- <u>Sample size</u>: 126 answers
- <u>Geographical location</u>: Greece
- <u>Demographic and Personal Data</u>: (Tables No1 to No6)























RESULTS AND DISCUSSION

The key findings of the study are presented in the Tables No7 to No33. Including experimental, correlational, or theoretical results, the key findings are categorized in the following order: **1.** The influence of Covid-19 on the operation of your hospital / health and welfare unit.

2. The choice of Teleworking in your hospital / health and welfare unit during the Covid-19 era.

- 3. The positive points of teleworking during the Covid-19 era.
- 4. Negative points or challenges of teleworking during the COVID-19 era.

According to a first approach to the subject, we observe that the results of the research are in line with the theoretical part related to teleworking. The theoretical part of the research is presented in the sector of the article with the title 'Implications'.

Key findings:

1. The influence of Covid-19 on the operation of your hospital / health and welfare unit:



Table 7





Table 9












2. The choice of Teleworking in your hospital / health and welfare unit during the Covid-19 era:













If you answered 'No' in the previous question, please explain the reason why.
-There was no choice.
-I work alone at office.
-It was not permitted by the administration.
-It was not necessary
-It was not possible to telework.
-We were not given this option.
-The administration did not allow us to do that
-My colleague worked part-time and I was alone in the department as a secretary.
-Firstly, due to my position and the department I am in, I could not work remotely. Physical presence was necessary. Secondly due to lack of staff.
-The nature of the job requires communication with patients, difficult distance communication.
-I had to be at work. Because my work is not done from home.
-Infeasible, due to increased workload.
-The nature of the work does not allow it.
-My work is not done from a distance
-Where I work we had to have a physical presence because it requires contact with the citizen.
-I did not want.
-Decision of a scientifically responsible person.
-Due to the nature of my work
-To protect myself and my loved ones.

3. The positive points of teleworking during the Covid-19 era:



Table 18

















Table 24



4. Negative points or challenges of teleworking during the COVID-19 era:



Table 25



Table 26

Table 27











Table 30











Table 33

Could you briefly mention some problems or challenges of teleworking during the COVID-19 era? What are the expectations regarding teleworking? -The problem is the equipment and the possibility to work while at home there are small children. The danger of a cyber attack. -Unpaided ovetime work, Lack of documents -It is positive that you start something and finish it, without being interrupted. Therefore you produce more. -Workplace isolation and inability to cling to common work problems -Non-professional space and equipment in my home -Difficulty communicating, quality of the network connection, the direct prints etc. Teleworking can not take the place of working life. Only for extremely unfavorable conditions and for protection of health. Out-of-hours teleconferencing -Conflict with family members, mainly children claiming parental exclusivity. -Delays in procedures -In the future teleworking will expand. -Hospital records and patients' personal data should not be left out of the hospital. -Technical assistance, in case of problems or questions, they are more difficulty to solve. Mental exhaustion, sedentary work and health problems. Such problems require health care. -I believe that teleworking cannot be fully implemented in the administrations: 1) there is no complete computerization in Hospitals (we are years behind. An example is the electronic document handling system) 2) Most administrators do not have computer skills (at least in the hospital I am in) 3) Greece and households are years behind in Internet speeds. The same goes for many hospitals. 4) If you find an administrator if he has a computer at home ... (usually only their children have it) 5) Security issues for connection to the network of a hospital. -Requirement for everyone to become familiar with technology. To serve the department where we work under any conditions. -Intense use of the computer and direct dependence on it. -24/24 technical support is not provided. -In the public sector, the level of computer skills of administrators is too low to ensure complete teleworking. Also, in the public sector there is no complete computerization. An example is the electronic circulation of documents. Many hospitals do not yet have the ones that started a few months ago. -Teleworking is an amazing choice of flexibility for those who do not require physical presence, work without movement stress and better performance from employees who organize their own working time.

IMPLICATIONS

Teleworking in Health and Welfare Units during the Covid-19 Era

Remote working has exploded in the year 2020, with estimates suggesting that almost 40% of people employed in the EU started teleworking fulltime as a result of the pandemic according the European Commission (2020b). In other words, the year 2020 changed the world economy and the world of work in an unprecedented way. Since the outbreak of the Covid-19 pandemic, working from home has become the norm for millions of workers around the globe, including the teleworkable / administrative sectors of greek health and welfare units (see Tables No7 to No12).

Advantages

Before the pandemic only a small percentage of 13% of employees of greek health and welfare units had worked remotely (see Table No13) while since the Covid-19 pandemic a percentage of 65,9% of employees have been working remotely (see Table No16). Furthermore, research proposed that teleworking could improve employees' job satisfaction and commitment to an organization and even their job performance. Teleworking could also reduce work-related burnout and stress, perhaps due to reduced commuting or more flexible hours. Other profits include reduced commuting costs and greater freedom to work independently (see Tables No14 to No24). Last but not least, thanks to remote work, the health

and welfare units can thus continue without interruption the operation of their administrative services by supporting effectively and dynamically all the other health and welfare services.

Are there any disadvantages or challenges ?

Nevertheless, teleworking has always had downsides, such as social and professional isolation, reduced opportunities for information sharing, and difficulties in separating work and personal time. The lack of physical separation between these two worlds can create problems, such as family responsibilities to spill over into work and work obligations to intrude into family time. This can cause teleworkers to work overtime to prove themselves, leading to burnout. The ability to be constantly connected to work through a variety of technologies (p.ex. Zoom, Slack) can also cause employees to feel unable to unplug at the end of the day (see Tables No25 to No33).



Source: Macaulay & Gretchen, 2021.

Teleworking during the pandemic poses additional challenges. New home-workers are probably not used to being isolated from their co-workers and may not have a home office or work-friendly area (see Table No34).

Besides, getting virtual meeting technology to work well is not always easy. In addition, it just seems like another chore, which however is necessary to social distancing. With other family members potentially also at home, including children or a partner, avoiding distractions and interruptions can be nearly impossible. This challenge concerns especially women due to parenting (see Table No35).

Table 35



Teleworkers may not have a home office or work-friendly area. To find privacy, employees might find themselves in the awkward situation of conducting meetings and their duties from their bedrooms or kitchens. And getting virtual meeting technology to work well is not always easy. All these changes can originate anxiety, fear of job loss, anger, sadness, or frustration (European Commission, 2020, ILO, 2020).



The potential factors of organizational stress associated with teleworking in the COVID-19 era are categorized as follows (see Table No36):

1.Environmental: the economic uncertainty that accompanies the health crisis is a stressful factor, due to the fear of losing a job. Simultaneously, a technological change is taking place.

2.Organizational: with the assumption of responsibilities, the work role of teleworkers is overloaded, while there is a lack of social support, space problems and distraction.

3.Personal: this is the case of conflict of family-professional responsibilities.

As a consequence of work stress, the following symptoms are observed, which impede efficiency and productivity:

I)Physiological: e.g. headaches, high blood pressure, chronic diseases.

II)Psychological: eg job dissatisfaction, depression, uncertainty about future prospects due to pandemic, insufficient conditions for well-being.

III)Behavioral: e.g. nervousness, absenteeism.



Regarding the responses to job dissatisfaction of the teleworker can be categorized as follows (see Table No37):

i)Exit. ii)Voice. iii)Loyalty. iv)Neglect.

The above-mentioned conditions may have a negative impact on business in the following aspects:

a)Decreased productivity: as a result of low performance and deviant behavior at work due to lack of job satisfaction.

b)Low degree of internal business communication/cooperation: given the work inclusion experienced in teleworking conditions, there is a high possibility of misunderstandings within the company and time delays.

c)Poor services/products quality: as a consequence of the above problems such as low morale and the increase in the number of errors, the project provided may not meet the specifications of the company (Robbins and Judge, 2018:103-105 & 546-555).

Regarding the organizational measures that would be proposed in the management of the stress of the teleworker in our case are the following:

-Training: training in the form of seminars can help support and improve self-efficacy.

-Employee involvement: the employee must be involved in matters related to his/her job performance

(eg making decisions or submitting proposals for improvements).

-Organizational communication: due to the isolation of the individual it would be useful to increase

the formal organizational communication in order to properly manage issues and reduce stress. -Leave and wellness programs: for exhausted employees, it is important to take leave for their rejuvenation and to have access to psychological support programs.

The case of Papageorgiou Hospital

- The case of teleworking in the administrative services and in the accounting department of Papageorgiou Hospital is remarkable. We employees are alternately one day work at the office – the next day work at home, depending on the needs of our department.
- Therefore, we do not feel cut off from our workplace, while at the same time we can fully support the proper functioning of the hospital by participating in issues that affect our performance.
- The teleworking has also become feasible thanks to the electronic documents management system and the digital signature, which have been operating for more than a year in our hospital. These elements contribute significantly in the proper organizational communication between all departments electronically and in the context of the digital transformation that is taking place nationally and globally.
- Despite the pandemic, the education of the employees continues normally through corresponding distance programs of the education office of Papageorgiou Hospital, which programs concern also teleworking.
- There are also programs of individualized psychological support for employees, offered from distance by mental health professionals to deal with the effects of the pandemic.
- So even in case of quarantine of employees due to pandemic, they can support effectively their department through remote working, without problems.

Conclusion

Turning challenges into opportunities

- In order to turn the above-mentioned challenges into opportunities for organizations, companies, employees and society as well, we must consider not only the profits, but also the negative aspects of the situation arising from the teleworking imposed by physical distancing rules and lockdowns.
- One thing is for sure: Teleworking is here to stay and reshapes the way we work. For this reason, there should be a focus on issues related to the problems in the implementation of telework of administrative sectors of health and welfare units in Greece, such as fast and secure internet access, training and support of staff or the digital transformation.
- Moreover, there should be another focus on issues related to work flexibility, job satisfaction and job performance related to teleworking, in order to decrease work-related stress, work-family conflict and burnout.
- In any case, we need to find the secrets to balancing work and family life. This means that further research on the subject is suggested.

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RESIDENT DOCTORS' LIABILITY AND MALPRACTICE IN EMERGENCY PERIODS

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ABSTRACT

The paper addresses the issue of resident doctors' liability, and burnout syndrome during the period of the Covid-19 pandemic in Central Macedonia, Greece. To indicate the association between liability, working stress, and burnout syndrome, qualitative research was conducted and its sample was 24 resident doctors who work at a variety of hospitals in Central Macedonia, using as a research instrument the method of the focus groups. The outcomes were analyzed with the use of the EnVivo 11.0 software shaping, a conceptual map that indicates the correlation of the following factors: liability, stress, and burnout syndrome.

Taking into consideration the extensively understaffed hospital units, the insufficient technical infrastructure at hospitals, the small number of beds in intensive care units to cope with a pandemic, and the lack of knowledge and experience in the management of Covid-19 infection, medical errors and malpractice may occur with negative effects on the physicians but mostly on patients. In this chaotic condition, the authors argue that in the current pandemic in Greece the liability of resident doctors' legal framework should be reconsidered, redefined, and re-established.

KEYWORDS: Resident doctors, medical liability, malpractice, Covid-19 pandemic, burnout syndrome.

PURPOSE

There is no doubt that the Covid-19 pandemic had severe implications on almost every aspect of human lives and led people to reassess values, behaviors, and mindsets worldwide. To constrain the spread of the virus, governments restricted human activities, reframing the fundamental structures of the global economy. The Greek healthcare system has been greatly affected by the rapid increase in patients infected with the SARS-CoV-2 virus and their need for hospitalization (Giannopoulou, 2020). It should be highlighted that the healthcare system at this time, was not ready -to say the least- to cope with a pandemic, especially after a decade-long financial crisis, which lead to inadequate backbone infrastructures and medical staff (Karidis, 2011). In this framework, the current article aims to underline resident doctors' liability in turbulent times such as the Covid-19 pandemic. Furthermore, the issues of effectiveness, satisfaction, stress, and burnout syndrome of the residents are also discussed and correlated to their liability during their internship, according to the national medical law.

INTRODUCTION

There is no doubt that the pandemic of coronavirus caused human and financial losses and raised public health problems worldwide. The reorganization of healthcare systems around the world and their strengthening by purchasing new equipment and recruiting medical staff was an unavoidable necessity. The COVID-19 pandemic further impaired the Greek healthcare system by establishing an almost suffocating national healthcare framework. Moreover, it should be mentioned that in this turbulent situation, the lack of knowledge and experience in the field of the SARS-CoV-2 virus along with

insufficient infrastructure and heavy workload, could cause unforeseen problems and increase the probability of the occurrence of medical errors and malpractice. Hence and keeping in mind that health care professionals are exposed to higher emotional demands it could also be argued that the overall unfavorable situation could lead to significantly higher levels of stress and exhaustion that could result in burnout syndrome. The main characteristics of this syndrome are depression, negative emotions, unwillingness to work, all of which can increase the probability of medical errors, and malpractice that can affect the safety and proper management of the patients (Giannopoulou, 2020, Li, 2021). The definition of medical malpractice according to the World Medical Association's 44th General Conference in 1992 is "An injury that occurs when a physician does not give standard treatment in medical care, has a skill deficit, or does not treat a patient" (Hagras, 2011). Resident doctors play a significant role in healthcare systems and especially in the Greek healthcare system. They are responsible for the emergency units and the management of the patients mostly without the presence of a specialist doctor. During this pandemic, as expected, they have undertaken a significant number of duties, amongst them the obligation to fill the gaps of the hospitals in emergency units and COVID-19 wards, regardless of their specialization and experience. Resident doctors - especially those in certain specialties, such as emergency doctors, general practitioners/ family medicine doctors, doctors of internal medicine, general surgery, and anesthesiologists - seem to be even more affected by the appearance of the pandemic, due to the higher workload, prolonged exposure to the virus, and first contact with patients. They also spend more time with the patients because they represent the communication interface between the specialized doctors and the patients. Thus, they can face burnout syndrome which may have an adverse effect on their psychology, as well as, their quality of work. The question posed in the current paper is the extent of liability of resident doctors in such an extreme situation as the pandemic and in the framework of a stagnated healthcare system, in which a variety of factors, such as increased working stress, may lead to the development of burnout syndrome (Papaefstathiou, 2019, Dimitriu, 2020).

THE LEGAL FRAMEWORK OF RESIDENT DOCTORS

According to the legal framework, every doctor is obliged to prevent the death of a patient and to ensure the protection of the patient's life and health during the conduct of medical procedures (Rogers, 2020, article 24 of the law 3418/2005). In compliance with the medical science and knowledge that residents gained during their medical studies, they must provide their services with conscientiousness and commitment, following the protocols and guidelines to ensure the health of every patient (paragraph 24, at the law 1565/1939, article 47). On every occasion, the unique expertise and skills of each physician should be taken into consideration, although there is a significant difference between resident doctors and specialists. Specialists are considered to have the necessary knowledge to deal with cases relevant to their specialization, while, in the case of resident doctors, a lot of factors should be evaluated. When a resident doctor is accused of malpractice or a medical error, it should be evaluated if the diagnosis or the management of the condition of the patient required special or additional medical expertise, which is provided from the acquisition of the specialization or whether the treatment could be done according to basic medical knowledge which was acquired during the undergraduate studies. In conformity with the provision of article 3, paragraph 2, law 3418/2005, the knowledge and experience of medical doctors is based on their university studies, their specialization, their continuous education, and the skills that they gained during the practice of medicine. Resident doctors are responsible to inform the specialists on duty about the medical condition of each patient immediately and especially in case of emergencies. They can be accused of misdiagnosis or mistreatment if they had not sought advice and assistance from the specialist when needed. Another reason why resident doctors can be charged, is in the case that they fail to provide or provide inadequate medical care to a patient when only basic medical knowledge and no further experience are needed for the patients' management. Also, they can be accused if they fail to order a diagnostic test or fail to perform a clinical examination and proper evaluation of the symptoms, which are necessary for the assessment of the patient's health, or if they misinterpret the findings of the clinical and laboratory examination, in cases where the diagnosis and the symptoms are obvious even for doctors without specialization. Another factor that should be evaluated is the compliance of the residents to the advice of the specialists, and in particular, if they acted in violation of the instructions and orders of the specialist (Presidential Decision, 797/2002).

The tasks assigned by the specialists to the residents often constitute their field of responsibility. The specialist is either obliged or co-responsible for the health and protection of the patient and, in any case, is considered to be the main doctor of the patient. Specialists are also responsible in case they assign to the resident, medical procedures and tasks which the latter cannot perform due to lack of knowledge and

experience and without the presence of the specialist (Katsantonis, 1970, Sideris, 1991, Valsamatzi, 2020). The resident doctor must take a purely critical approach of acquired expertise and knowledge and inform the specialist, providing the necessary and requisite details of the condition and seriousness of each patient. According to article 9, paragraph 3 of law 3418/2005, doctors, regardless of their specialization, must provide their services in emergencies. Residents are obliged to do so, even if there is no available equipment for practicing medicine until the patient has been referred to an appropriate specialist or transferred to an appropriate healthcare unit that can manage the patient properly with the appropriate equipment and the medical staff needed. In any event, the doctor should provide the highest possible level of services, using the available equipment. Even in the absence of a specialist and in case the life of a patient is in danger, the resident doctor is not allowed to deny services to the patient due to the responsibility of every medical practitioner to provide all available services to protect the life of every patient (Jannetis, 1991). In case of malpractice, the behavior and actions of the responsible residents and specialists will be evaluated independently. The behavior of each of them is going to be evaluated in detail as well as if they affected negatively the patient's health. The conditions under which the incident took place will also be assessed. In such a case resident doctors are not relieved of the accuse since they are only "resident doctors" and not "specialist doctors". There are several cases where resident doctors have been charged for malpractice and medical errors. Most often the specialists are also accused due to their responsibility of supervision and guidance of the resident doctors (Penal Code, article 28, also mentioned by Androulidaki & Dimitriadi, 1993, Kanellopoulou & Boti, 1999, Stathopoulos, 2004, Valsamatzi, 2020).

In general, doctors who commit a medical mistake or malpractice are exposed to one or more of the following: criminal responsibility, civil liability, and punitive responsibility. The three basic pillars of medical responsibility are the following medical errors which are the result of an action, the death or harm of a patient, and the causality between the medical error and the result (Hagras, 2011). All the members of the medical community should act according to the values of competence, conscientiousness, prudence, and devotion to their job. These values are inevitable for all healthcare workers (Toader, 2014).

RESIDENT DOCTORS PRACTICING MEDICINE DURING THE PANDEMIC

Nowadays the practice of medicine is becoming even more demanding and complex. Resident doctors play a significant if not crucial role in the Greek health system. During periods of public health crises, the directors of medical residency programs are responsible to maintain the wellbeing of their residents and ensure uninterrupted training. Generally, residents examine a broad spectrum of patients in the emergency units, manage the patients who are hospitalized, transfer emergencies to other health units when further management is needed, and sometimes they even undertake bureaucratic tasks, such as the writing of everyday reports, surgery reports, discharge notes, prescriptions, and death certificates (Obaid, 2021, Papaefsthathiou, 2019).

The pandemic of COVID-19 caused a significant impact on the healthcare industry, depleting resources and manpower, which also led to the disruption of the education of future medical doctors and residency training. The long-term problems of the national health system were highlighted. There is a great need for medical staff, equipment, and more beds in the intensive care units (ICU). Due to the lack of organization and medical personnel, the existing healthcare workers (residents, specialists, and nurses) working in the national health system were forced to fill the gaps and work overtime in extreme and deeply unfavorable conditions. Residents regardless of their specialization had to pause their education in their clinics to work in the COVID-19 units which were severely understaffed. The Greek government tried to facilitate and support the national healthcare system, offering incentives for private doctors to leave their private practice and contribute to the national health system, with a quite unsatisfactory response. Likewise, the government instead of creating new beds in ICU forced the private clinics to receive and hospitalize, patients who were not infected with the virus but needed intensive care treatment, while the ICU of public hospitals turned ultimately into Covid-19 units (Giannopoulou, 2020).

On the other hand, the healthcare staff faced a lot of difficulties during the period of the pandemic. It was not just the workload that worsened the situation, but other factors as well such as the prolonged wearing of personal protective equipment, excessive heat provided by it, lack of hydration, alimentation, and sleep deprivation. The stress of doctors was intensified due to continuous changes in the work schedule, changes of the shifts, time invested in learning and applying the proper technique to wear and remove the protective equipment, and lastly the fear of being infected with the virus. Wearing personal protection equipment creates a feeling of depersonalization which may have devastating effects on the doctor's psychology. Indeed, doctors who work with COVID-19 patients may face racism from their relatives, friends, and neighbors who may be afraid to meet them due to the fear of infection. All those mentioned above accentuate fatigue and stress and may lead to the development of burnout syndrome (Dimitriu, 2020). Unfortunately, only a few young people who aspire to become doctors are aware of the current situation in the healthcare system and the conditions that they are going to face in the future. Years of studies, working overtime, nightshifts, sleep deprivation, bad eating habits, lack of time for training, and intense stress are only some of the facts which can describe the life of a medical doctor. The above-mentioned factors in combination with the pandemic and the inadequate knowledge of this novel virus create extremely unfavorable working conditions for doctors and especially residents who are obliged to work in such unfavorable conditions (Launer, 2020).

THE COMBINATION OF STRESS, COVID-19 AND THEIR ASSOCIATION WITH MEDICAL LIABILITY

Burnout is related to mental and physical exhaustion due to work or caregiving activities. Burnout can be defined as a triad of emotional exhaustion, depersonalization, and reduced personal accomplishment (Dimitriu, 2020). The first person who described the term "burnout" in 1914 was a psychologist called Herbert Freudenberger. The appearance of burnout is common among medical personnel compared to the general population. The main reasons for this are their high dedication to their job, empathy for their patients who suffer, and the procedure of decision-making that is closely related to the life and health of patients. The evaluation of burnout is conducted with the use of a questionnaire called the Maslach Burnout Inventory (MBI). The exceptional conditions which were created due to the pandemic increase the possibility of burnout development in medical staff. However, until the pandemic is over, we cannot be sure about its effects on physicians' burnout (Dimitriu, 2020, Launer, 2020, Li, 2021).

The appearance of a novel virus and the declaration of the pandemic created an emergency worldwide. The national healthcare systems were called to face the pandemic with all means available. Due to this emergency, the long-term problems of the Greek health care system became apparent. It should be highlighted that the current situation intensified the already existing problems which were more pronounced after the financial crisis. The lack of knowledge about the virus, proper education of medical staff to fight the pandemic, and experience, created intensive conditions at Greek hospitals. All those mentioned along with the absence of adequate medical personnel, appropriate equipment, and infrastructure, created extremely unfavorable conditions and intense stress to the medical personnel. The healthcare workers of different specializations and fields were called to work in COVID-19 wards. The fear of the unknown and of getting infected with SARS-CoV-2 plays a significant role in the psychology of the healthcare workers and increases stress (Giannopoulou, 2020, Li, 2021). In a short period, many things changed and people, especially those who work in health units were forced to get used to a new way of living. The medical staff of the COVID-19 wards was called to learn several new things. The proper way of wearing and removing personal protective equipment, extra shifts, sleep deprivation, and dehydration cause intensification of stress and exhaustion which may lead to the appearance of burnout syndrome (Dimitriu, 2020). The possibilities of medical errors and malpractice were increased due to the workload and lack of knowledge and experience in the field caused by the appearance of a novel virus (Hagras, 2011).

The factors which were mentioned above create the need to redefine and reconsider the medical liability during the period of the pandemic. The Panhellenic Medical Association considering the current situation and the unfavorable conditions for doctors who face a lot of difficulties daily proposed the exemption or the limitation of medical liability until the end of the pandemic.

RESEARCH METHODS

The methodology of qualitative approach should be used in cases where research focuses on the study of the acquisition of human experience and the investigation of people's opinions or on a new field whose concepts are not fully understood, as well as in case of a new product or service (Hancock et al, 2007). Qualitative data analysis is used in the context of an empirical study. It can have different approaches to qualitative research, which may alternate in terms of scientific assumptions, in the formulation of scientific questions, and the terms of data analysis (Willig, 2015). Most analyses, however, involve a type of thematic data processing that follows the principles of thematic analysis. Thematic analysis presupposes the systematic recognition, organization, and understanding of repetitive patterns related to

the meaning, within a data set. Thus, the researcher is capable to investigate the possibility of cognitive access to collective ways of rendering meaning and collective experiences, as well as the consequent possibility of being able to detect numerous patterns of meaning and focus on issues related to the subject under study and the research questions. The process of analysis presupposes the active and creative role of the researcher, who develops an interactive relationship with the data. This leads to the production and construction of the issues more than their discovery (Avdimiotis, 2019).

The data collection involves the concentration of focus groups which differ from the method of individual interviews. One of the main advantages of focus groups is that during the interview a participant's comment can provoke successive reactions, stimulation, and discussion of the subject which was commented [Hess (1968) in Stewart & Shamdasani, 1990]. The individual interview was used additionally because it can better illustrate the aspects of the subject, according to what the researcher deliberately deemed. Focus groups, moreover, can provide an appropriate framework for business and counter-arguments when based on "real" social groups (Krueger, 1994). Every conversation is recorded and then transformed by the researcher into written text. The choice of a notation system for transcription depends on the type of analysis adopted by each researcher, as well as the purpose of the research (Willig, 2015). For the thematic analysis, which focuses mainly on the content of the speeches, a simple notation system is enough. This system should permanently capture what is discussed and take into consideration some very typical para lingual manifestations (e.g. laugh, long pauses, strong emphasis).

The researcher accurately captures the words of the groups, without correcting the errors, the omissions, the breaks, the repetitions, and records. The selected notation system is also reported in the appendix. This is followed by coding, a process in which data is interpreted and processed. According to the literature "codes" are called the meanings which are given by the researcher to each data section (Avdimiotis, 2019). In the same abstract, more codes can be accepted, or the same code can be given in multiple abstracts (Willig, 2015). In the next step, there is a transition from the codes to the topics. Themes are conceptual constructions, non-objective, and more general than codes. They result from the process, merge and comparison of codes and correspond to a repetitive pattern of meaning. They constitute autonomous conceptual entities and can function as possibilities of answering the examined research questions (Tsiolis, 2017) In the final stage, the report of the conclusions takes place.

The current research was carried out in October 2019 in combination with the gathering of focus groups, consisting of a total of 24 resident doctors of different specialties, who work at a variety of hospitals in Central Macedonia. The selection was random. The meetings had a specific structure and were divided into three sections: The first section included the determination of the legal framework of medical liability of resident doctors. In the second section, the empirical knowledge of the participants on the topic was recorded with the help of questions and with a focus on the effectiveness in the management of the current situation. The third section focused on the perspectives of the participants in the present and the future. The conclusion of this research shows that understaffing, insufficient equipment, and lack of practical and theoretical knowledge and experience on the topic of the novel virus are fundamentals in dealing with the Covid-19 pandemic.

RESULTS AND DISCUSSION

The focus group indicate that

- 1. The legal framework for resident doctors is not clear enough to secure the seamless flow of medical services. There is no doubt that every doctor should protect the health of every patient, although in the case of resident doctors this presupposes that they have the appropriate knowledge to manage the health care condition of the patient. In general, the main responsible doctor is the specialist, however, there are some cases in which the resident may be accused. It should be highlighted that during the pandemic the working conditions changed, regarding the working hours as well as the inadequate knowledge for the management and treatment of patients infected with the SARS-CoV-2 virus. These increase the possibility of mistakes and the residents' fear of being accused
- 2. The pandemic has aggravated medical responsibility. Nowadays, more and more patients are threatened with lawsuits. The fear of death makes a lot of people start blaming the doctor before the treatment even starts and threatening him/her that if they do not recover which is

something that the doctor cannot guarantee, the doctor will be brought to justice. On the other hand, being forced to work in a field in which you do not have the necessary knowledge intensifies the stress, especially for the residents who are at the beginning of their careers. All those mentioned above lead to burnout syndrome and sometimes residents quit their jobs and search for another job with better conditions both in Greece and mostly abroad.

- 3. The knowledge regarding the impact of the virus on human health is generally inadequate. Unfortunately, when a novel virus appears doctors do not have the appropriate scientific knowledge to combat it. Research and time are needed to manage such strenuous situations and to collect the appropriate data. The long-term effects of the virus on patients are still unknown. The lack of knowledge and the unknown are the key factors that intensify the stress of both doctors and patients.
- 4. The Greek health care system is almost suffocated by understaffing and insufficiency of the amount and equipment of the ICU. There is a great need for staff. However, it is very difficult to find qualified staff, especially at the beginning of a pandemic where the needs increase exponentially and the healthcare units are not adequately prepared. This led to the use of the already existing staff, some of whom were not properly qualified to manage a pandemic. The paradox is that over time no special effort was made to create more infrastructure such as ICU beds or to hire or even further train the existing medical staff.
- 5. The lack of primary health care units in the Greek health care system is also a factor that increases the number of patients seeking help in hospitals. The role of primary health care was always underestimated in our country. Although, this pandemic highlighted the importance of the existence of a well-organized and staffed primary health care since it could have played a significant role in the management of the pandemic and it could have decreased the number of hospitalizations and the severity of symptoms.
- 6. The combination of all the aforementioned factors has a severe impact on resident doctors' anxiety and stress, which eventually leads to the appearance of burnout syndrome. Resident doctors were forced to work overtime under emergency conditions since the beginning of the pandemic. Due to the lack of staff, they were not allowed to take their days off from work which also had devastating effects on their psychology. Night shifts, lack of sleep, unhealthy eating, isolation from their family, abscess of personal life are only some of the problems that they faced during this period. Working under these conditions leads to depression, stress intensification, and burnout syndrome.

Taking into consideration all those mentioned above, the members of the focus groups unanimously suggest the reframing of the legal framework about medical liability, the practice of safe medicine with the appropriate knowledge and infrastructure, as well as the maintenance of the residents' educational programs.

IMPLICATIONS

Nowadays the practice of medicine is becoming more and more complex. Some of the most significant reasons for this are the administrative and legal challenges that physicians may face. It is essential, therefore, that all doctors are acting following the medical law. In this worldwide "tempestuous" situation and especially in Greece, where the healthcare system is struggling to maintain the vital resources needed to remain functional, the liability of doctors and especially resident doctors should be reconsidered and redefined. Resident doctors are performing medical procedures bearing full responsibility for their actions. This is extremely difficult due to stress, inappropriate knowledge, and infrastructure deficits, along with the lack of experience to confront SARS-CoV-2. Due to these unfavorable conditions, the legal framework has to be reformed by reducing medical responsibility and liability. Besides this, residents at the beginning of their professional lives are more likely to suffer from intense anxiety and stress, which are also quite important factors for misjudgment and malpractice. In this framework, the reorganization of the healthcare system is required. Educational programs have to develop COVID-19 treatment protocols and guidelines to minimize the risk of medical errors and malpractice. Healthcare managers together with medical directors of clinics are responsible for designing operational strategies to face the ongoing challenges and for creating an infrastructure that will enhance the ability of the healthcare system to react to possible future health threats. A pandemic management strategy is needed within all residency programs since the lack of organization may cause a dramatic impact on residents' educational experience and their overall well-being.



Figure 1. Redefinition and reconsideration of Medical liability

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HUMAN RESOURCES MANAGEMENT

MOBBING AND NURSING

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ABSTRACT

Work-related psychological violence can be defined as a situation in which a person experiences hostile behavior by one or more people in his / her working environment, who constantly and repeatedly attempts to hurt him, suppress him, abuse or block or isolate him for a long time (Leyman, 1996). The purpose of this paper is to record the mobbing rates and identify the causes. The sample consisted of 91 nurses. The results show that behaviors are being practiced at the workplace, affecting about half of the research population and largely experiencing them until today.

KEYWORDS: Ethical and psychological harassment, Talking, Labor harassment, LIPT questionnaire.

PURPOSE

To investigate the presence of the syndrome of moral harassment / psychological violence (mobbing) the Leymann criteria are set according to which there should be:

1. At least one mobbing behavior (one of the 45 harassment behaviors included in the LIPT questionnaire distributed.)

2. At least once a week

3. For a period longer than six months

4. All the above within the last twelve months (Leymann, 1996).

The purpose of the study is to record the views of respondents on the presence or absence of psychological pressure / violence (mobbing) in the workplace of a sensitive sector, such as that of the hospital "G.N.TH. Agios Dimitrios »The investigation of the" mobbing "syndrome will help to document first the awareness of the employees and then will reflect the existence or not of the legislative framework and institutions, which can contribute to its prevention and treatment. Since the literature review through the international literature has shown not only the existence of the syndrome but also the harmful effects it has on the respective victims and organizations, this work becomes necessary. The field of health and especially its nursing body are a particularly vulnerable sector of public and private organizations. The multifactorial field of health with its diverse actions and responsibilities is a particularly stressful environment that can be a fertile ground for the manifestation of mobbing behaviors. The thesis of the work aims to capture the mobbing rates, based on the definition of the LIPT questionnaire and the Leymann criteria, to determine the causal factors, to highlight which groups are most vulnerable to mobbing, to describe the ways in which mobbing is expressed and to record the ways of dealing with the victims.

The main research questions asked for the study of the above research problem are:

1) The "mobbing syndrome" is perceived by the nursing staff of the hospital "G.H.TH. Saint Dimitrius "?

2) What factors are to blame for the occurrence of "mobbing syndrome" among the nursing staff of the hospital "G.H.TH. Saint Dimitrius "?

3) Is there a lack of legal framework regarding the protection of the victim and the punishment of the perpetrator?

4) What are the suggestions for treating "mobbing syndrome"?

RESEARCH METHODS

For the purposes of the study, it was deemed more appropriate to use the quantitative method, using a questionnaire and for this reason, the largest possible sample of participants was used, so that there is a greater possibility of generalizing the results to the specific organization. The Leymann Inventory of Psychological Terror (LIPT) questionnaire was used to evaluate the data in this research paper. The LIPT questionnaire is a widely used research tool for the quantitative evaluation of mobbing syndrome and has been used in various countries. The internal cohesion index ranges from 79-86 (Nielsen et al. 2010).

The Greek translation was made from the French version of the questionnaire according to the procedure proposed by the "Trust Scientific Advisory Committee" and was evaluated for its validity and reliability. The pre-screening was done by distributing ten questionnaires and their relevant processing. The use of the questionnaire in the present study was authorized by Ms. Niedhammer Isabelle. The questionnaire is divided into three parts.

The first part mentions the purpose of the research, the instructions for its completion as well as the voluntary and anonymous participation of health professionals in the research. The researcher's details are then listed, so that participants are given the opportunity to clarify anything that may arise regarding the completion of the questionnaire.

The second part of the questionnaire lists the mobbing behaviors that the employee may encounter in the workplace. Behaviors are classified according to their nature and impact on victims into 5 categories, and each category describes from 5 to 14 states of psychological violence, a total of 45 states (Leymann, 1996). Behaviors that affect employment relationships, social relationships, work practice / occupational status, social image, and victim health are described. They manifest respectively, with the obstruction of expression and communication, with the social isolation, with organizational measures (modification of professional duties) with rumors and attacks on the privacy of the victim, and finally with physical and / or verbal violence.

Participants report whether they have been exposed to any of the reported mobbing behaviors in the last 12 months, and how often they have experienced them. The definition of psychological violence is then given and if they have suffered, they are asked to identify the factors to which they attribute its existence. The last part, which was modified by the researcher for the needs of the research, presents the demographic data and work characteristics of the participants. The demographic and labor data were based on the corresponding ones of CHIRA (2014) with the corresponding modifications in order to better respond to the participants.

This questionnaire was chosen because it takes a short time to complete, about 5-10 minutes, a very important advantage for the responsiveness of the research sample. In addition, it covers many situations of psychological violence that develop in the workplace and finally, it has been widely used in both international and Greek research to record the presence of the syndrome among health professionals.

The definition of Mobbing used in the present study is as follows: Work-related psychological violence can be defined as a situation in which a person experiences hostile behavior from one or more people in the work environment who are constantly and repeatedly trying to hurt him, to oppress him, to abuse him or to exclude him or to isolate him for a long time.

RESULTS AND DISCUSSION

The research population is the nursing staff of the hospital "G.H.TH. Agios Dimitrios" in Thessaloniki. For the fidelity of the results, 150 questionnaires were distributed, of which 107 were received with invalid 16 and valid 91. 16 questionnaires were considered invalid in which there were deficiencies in their answers and made it impossible to further process them.

The total number of nurses participating in the research is 91 people. Most nurses are Nurses in 57% (n = 52), Assistant Nurses in 36% (n = 33), Supervisors in only 7% (n = 6) of which 29% are men (n = 26) and the remaining 71% are women (n = 65). 26.4% (n = 24) were 36 to 40 years old, 20.9% (n = 19) were 41 to 45 years old, 19.8% (n = 18) were 45 years old up to 50 years and only 18.7% (n = 17) of the participants were over 51-55 years old. Based on education, it is found that the majority are TEI / HEI graduates at a rate of 51.6% (n = 47). They are followed by 37.4% (n = 34) of Lyceum graduates and holders of a master's degree at a rate of 11% (n = 10). Most of the participants are married at a rate of 61% (n = 56), followed by unmarried participants at a rate of 30% (n = 27). Divorced and widows or widowers follow in a smaller percentage in percentages of 7% and 2% respectively. Based on the duration of work, most participants report that they work for more than 21 years at a rate of 25.3% (n = 23), followed by those who have 16-20 years of service, 11-15 years and 6-10 years in percentages. 24.4% (n = 22), 23.1% (n = 21) and 22% (n = 20) respectively. Only 3.3% (n = 3) have less than 1 year of service and 2.2% (n = 2) have 1-5 years of service (table1).

sex	Female= 65	Male=26	Total =91	
age	36 to 40 years=24	41 to 45 years=19	up to 50 years=18	over 51-55 years=17
education	university graduates=47	secondary school graduates/team leaders=34	postgraduate students=10	
Marital status	Married=56	Single=27	Divorced=6	Widows=2
working experience	more than 21 years=23	16-20 years=22	11-15 years=21	6-10 years=20

	Table 1. Characteristics	s of the	participants	in	the	survev
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The study was conducted at the premises of the public hospital "G.N.Th. Agios Dimitrios "in Thessaloniki from 14/10/2017 to 30/11/2017. Written permission was granted by the Scientific Council of the hospital to carry out the research. For the data collection, questionnaires were distributed in open opaque (yellow) envelopes so that the participant, when completing it, could seal it and deliver the envelope. A specific delivery point had been identified for the collection of the questionnaire files. We emphasize that both the files and the specific delivery area allowed each health professional to participate in the research, thus ensuring the confidentiality of the answers and their anonymity. The reason for choosing to use an anonymous questionnaire is because in the object of the research, it was estimated that the name may have acted as a deterrent, since in practice it is not easy for an employee to state by name that e.g., his colleagues treat him badly, he is abused by his boss, etc. The sample for the selection of the participants in the research was based on probability sampling.

The software Statistical Package for Social Sciences -SPSS was used for the quantitative analysis of the data. In the analysis of quantitative and qualitative data carried out, techniques of data presentation in a concise manner were applied, according to the principles of descriptive statistics. Non-parametric criteria were used in the inductive analysis, in combination with the Contingency Tables. For the control of the relationships of the variables, the non-parametric criterion X2-relevance control was chosen (Gialamas, 2005). In those cases where the conditions for use of this test were not met, the corresponding MonteCarlo simulation test was selected (Dafermos, 2011). Finally, $\alpha = 0.05$ or 5% was chosen as the level of control of the statistical significance of the relations (Gialamas, 2005).

The most common conflict behavior is the statement "speak often behind your back" 31.9%, for at least once a month 30% and 79% still face mobbing behaviors until today. Mobbing behaviors have been observed in others at 45.1%. These behaviors come from a hierarchically superior to 34.1% and is attributable to the poor organization of the organization by 27.5% and the management problems by 34.1%. For the recognition of the syndrome, they addressed mainly to colleagues by 29.7%. At the table 2 described the percentage of results of mobbing by Leymann Criteria, which is the final scor of this research. The percentage recorded based on them is 16.48% (n = 15).

Table 2 Results of mobbing by Leymann Criteria

Leymann Criteria	Participants	Result
At least one hostile attitude, at	100%	16,48%
least once a week, lasting more than six months within the last	(n=91)	(n=15)
twelve months		

The proportion of women as victims of mobbing seems to be higher 73.3% compared to 26.6% but within the sample the largest percentage of workers is due to the nature of working women. There is a small difference in the percentage in relation to the sex based on the general population, 15.38% for men and 16.9% for women. Gender does not seem to significantly differentiate the number of the above behaviors that the respondents have suffered.

Zero result occurs in the ages 20-25 and 55-60 without being able to be fully documented, since according to the Greek data of our time regarding the first group of 20-25 may not participate in the workplace due to reduced recruitment in public and for the second group of 55-60 may have retired. In the other age groups, there are no significant variations.

Zero outcome was seen in widows. A small percentage is observed in the divorced (6.6%) and the highest percentage is observed in the unmarried (60%).

Bosses are not portrayed as victims of mobbing. The largest percentage is attributed to the nursing staff of university and technological education, which was also the largest percentage of the sample, a fact that justifies the difference.

Mobbing victims are said to be more people with a working life of 6-10 years. Maybe because then the professional fatigue begins with the simultaneous rise of the first ambitions as well as the full professional awareness.

The largest percentage is attributed to the graduates of AEI / TEI. This difference can be justified by the proportions that exist between the AEI / TEI nurses and the DE nurses in the general population.

The period that victims of mobbing experience ranges from seven months to fifteen years with the largest percentage being attributed to the duration of up to five years. The fact that 100% of the victims are still experiencing mobbing at the time of the investigation is considered commendable.

Friends and acquaintances lead the way as a source of help with 73.3% with family members and relatives, social worker or psychologist following with a difference of 33.3%. Zero results were recorded in the staff representative, trade unionist, labor inspector, administrative commissioner, occupational physician, physician of another specialty and the statement.

There is no difference in the sex of the perpetrator, with the downward mobbing direction being in the highest position (80%), followed by the horizontal (60%) and to a very small extent the ascending (6.6%). The mobbers were either one person or groups of 2-5 people with the duo dominating at 33.3%.

The lion's share as the causes of mobbing is attributed by the victims to the management problems and the poor organization of work that are in line with the findings of the international literature. The rate of

20% for leaving work is worrying, while the zero rate in the statement for being different from others (age, gender, nationality, disability) is encouraging. Also, in the statement I do not know the percentage is zero.

The answers to the research questions are listed below:

- 1) The "mobbing syndrome" is perceived by the nursing staff of the hospital "G.N.TH. Saint Demetrius "? The answer to this question is yes based on the following documentation. According to Leymann's definition of mobbing, 40% of participants have experienced mobbing behaviors in the last twelve months. Ethical or psychological harassment at least once a week for more than six months was accepted by 22.3% of respondents. According to Leymann's criteria for the frequency of mobbing, 16.48% of respondents have experienced mobbing at least once a week for at least six months in the last twelve months. 45.1% of respondents have experienced psychological violence against another person in the area. work in the last 12 months. The psychological violence between the nursing staff of the hospital exists in a high percentage and is perceived by the employees.
- 2) What factors are to blame for the occurrence of "mobbing syndrome" among the nursing staff of the hospital "G.N.TH. Saint Demetrius ". Percentage data from two groups will be used to document this answer. The first group concerns the responses of all participants and the second the responses of participants who, according to Leymann's definition and criteria, have been identified as victims of mobbing. Accordingly, 34.1% and 80% of employees respectively attribute Mobbing behavior to management problems, poor work organization 27, 60% and 60%, bad work atmosphere 13.2% and 26.6% and competition rates between employees 11% and 26.6%, envy and jealousy 7.7% and 26.6%, conflict and labor disputes 8.8% and 13.3% and the will in forcing the victim to leave his / her job 2.2% and 20%. The highest rates of causation for the development of mobbing behaviors are attributed to the organization itself, its structure and its management, generally agreeing with the findings of another research.
- 3) Is there a lack of legal framework regarding the protection of the victim and the punishment of the perpetrator?

Although there is no such question in the questionnaire, the answer will be attempted mainly based on the percentages of the answers of the characterized victims of mobbing, since they would need protection and satisfaction from the punishment of the perpetrator. After all, this was the reason why this research question was asked, in order to understand whether the victims need help. 11 out of 15 victims of the present survey, 73.3% turned to friends or acquaintances outside the workplace for help, 6 out of 15 victims, 40% to a colleague, 5 out of 15 victims, 33.3% to family members and relatives, 5 out of 15, also 33.3% to a social worker and psychologist and 2 out of 15, 13.3% had nowhere to go even though they would like to. Only 4 out of 15 contacted the agency, such as the supervisor or staff. All 15 victims said they needed to go somewhere for help. The victims' responses clearly indicate the need to seek help. Because the choice of help cannot be identified, there can be no clear answer to this question.

IMPLICATIONS

The hypothesis in this study was confirmed, since the present study shows that 1.6 out of 10 health professionals experienced at work, according to the definition and criteria of Leymann (at least one behavior, at least once a week, and for at least six months, within the last twelve months) mobbing behavior (moral / psychological harassment). About two in ten nurses have experienced a total of psychological or moral harassment at least once a week, at least one hostile behavior for more than six months. The results of the research show the percentage of mobbing at quite high levels. In particular, the largest percentage (79%) of health professionals who stated that they have been exposed to one or more mobbing behaviors continue to experience them even today. 12% said they had been confronted them in the past in another job, while 9% said they had been confronted them in the past in the workplace where the survey was conducted. The percentages of this research for the recording of "mobbing syndrome" amount to 16.48%, without it being possible to compare with other research of previous years in the same hospital, with a similar population and sample and without being able to record the possible influence of the economic crisis that Greece is experiencing in the last decade, in the creation of the specific result.

Regarding the number of behaviors reported by health professionals in the various ethical harassment groups, the survey showed statistically significant differences in age, educational status, and occupational status in three behavioral groups. Specifically in the group "behaviors that threaten communication" and affect the working relationships of health professionals, it was found that the youngest in age were affected (25-34).

Regarding the source of mobbing behaviors, according to health professionals, 34% of people came from people who held a higher position in the hierarchy than them (indirect or direct superiors). 16.5% from colleagues and 4.4% from subordinates. The results show that individuals, who hold positions of responsibility or are in a higher rank, abuse power, exercising abusive behaviors towards their subordinates.

The results of the present study could be a springboard for further research in other categories of health professionals (e.g., medical staff) as well as in other hospitals, so that there can be a more general picture of the syndrome in health services. care. In addition, the research was conducted in a time of economic crisis, where significant reforms in the health sector were implemented. Hospital reforms, unavailability of financial resources in the health sector, downsizing and low pay are among the factors that can increase psychological violence in the workplace and trigger mobbing behaviors. In any case, the economic crisis must be considered, which has affected all sectors of employment, especially the health sector, and consequently the health professionals themselves.

In conclusion, the present research was an attempt to investigate and record the "mobbing syndrome" in the nursing staff of the GNTH hospital. "Agios Dimitrios" in Thessaloniki. The results describe those mobbing behaviors were experienced by about half of the population of the research sample and a large percentage of them experience them until the end of the research. Mobbing behaviors come mainly from direct or indirect bosses and mainly women, without being able to particularly assess gender, since it is an area of work where female employees predominate. The victims of "mobbing syndrome" are mainly people aged 35-44, women and divorced / widows. Nurses exposed to "mobbing syndrome" attribute the causes of psychological violence mainly to organizational problems of hospitals, such as bad work atmosphere, competition problems, poor work organization, and management problems as well as the factor of jealousy. To deal with the pressure the victims received, they turned mainly to colleagues. The results of the present study do not differ in substance from the results of other relevant studies in Greece and worldwide, confirming the existence of the "mobbing syndrome" and the call for help to the victims.

The present study, as well as other studies in Greece that highlighted the existence of the mobbing phenomenon, made visible the lack of a legal framework regarding it. The lack of definition by the state alone, automatically gives space to the perpetrators and weakens the victims from claiming any form of justice, but also claiming any compensation from the victims either morally or financially. Also, the relative impunity of the perpetrators, strengthens them and at the same time leaves without any restriction the development of mobbing syndrome.

Conducting more and more research-studies in various workplaces, firstly makes the mobbing phenomenon more known, raising more awareness of all employees and organizations at the same time and secondly can act as a lever for legislators to establish a legal framework regarding the same. It is well known that the enactment of laws usually follows phenomena.

Our proposal concerns the future research of the mobbing phenomenon in other hospitals, in order to accurately capture the phenomenon and in second time to be able to carry out research on mobbing, which may be experienced by health professionals by citizens. Also, our proposal is the definition of the phenomenon and special provisions in the Civil Service Code and the Greek legislation, which will take care of its prevention and treatment. The definition and objective measurements of "mobbing syndrome" can act as a deterrent for the perpetrators, but also to protect the organizations from potential self-proclaimed victims, who through their self-victimization could cover various situations, such as their professional incompetence, covert ambition, etc., situations that mainly affect public organizations, if permanence ensures work. Awareness of the "mobbing syndrome" in the workplace could be the beginning of its reduction and prevention.

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QUALITY ASSURANCE IN HEALTH UNITS

EVALUATING HEALTHCARE SERVICE QUALITY USING PATIENT SATISFACTION. THE CASE OF PULMONARY CLINIC OF THE GENERAL HOSPITAL OF SERRES.

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ABSTRACT

The study aims at investigating health services provided by the Pulmonary Clinic of the Public General Hospital of Serres, Greece, through patient satisfaction. Primary data were collected using a structured questionnaire. A convenience sample of 196 patients participated in the study. Four factors were used to access patient satisfaction; namely: access, reception and accommodation upon admission to the pulmonology clinic, medical care, nursing care and leaving procedure from the clinic. The overall satisfaction of patients is high. Nursing care and medical care were rated higher. Younger patients are more satisfied compared to older patients and women appear more satisfied than men regarding medical care.

KEYWORDS: Patient satisfaction, Public hospital, Pulmonary Clinic, Greece.

PURPOSE

Nowadays, there is an increasing interest on health service quality, patients' needs and patients' satisfaction (Chalikias et al., 2016). Health service quality is a highly discussed principle of health policy at national, European and International level (Busse et al., 2019; WHO, 2018) motivated by a variety of reasons ranging from general commitment to high-quality healthcare provision as a public good and growing awareness of gaps in safe (Busse et al., 2019) to competition in the healthcare industry as the number of healthcare organizations increases (Drosos et al., 2018).

The term "quality" has been defined from different orientations and perspectives which may be appropriate in different circumstances and contexts (Shaney et al. 2004; Zafiropoulos & Vrana, 2008) depending on the measures applied and the person employing the definition (Tapiero, 1996). In the

context of health care systems people use the term "quality" to describe positive aspects of doctors and hospitals (Busse et al., 2019). However, quality in healthcare is more than this. Donabedian (1980) gave one of the most accepted definition for healthcare quality and mentions that it is "care which is expected to maximize an inclusive measure of patient welfare, after one has taken account of the balance of expected gains and losses that attend the process of care in all its parts". Later on, Lohr (1990) defined quality in terms of health services as ".... the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge". Approaches like this, defining quality as a service have evolved in terms of satisfying expectations and needs of customers (Seyanont, 2007; Vrana, Dimitriadis & Karavasilis, 2015). The definitions vary also depending on perspectives and interests of the different stakeholders, managers, professionals, policy makers, payers and patients. Mosadeghrad (2011, p. 214) taking into consideration stakeholders perceptions of what constitute high-quality healthcare services identified eight quality characteristics "Right Care in the Right Way for the Right Individual in the Right Place at the Right Time by the Right Person and for the Right Price to achieve the Right Results" and by integrating healthcare service aspects and patient needs defined quality healthcare service as "Consistently delighting the patient by providing efficacious, effective and efficient healthcare services according to the latest clinical guidelines and standards, which meet patient needs and satisfies providers".

Patient satisfaction is a growing concern in all aspects of healthcare, and the voice of the patients is a measure of the quality (Kruse et al., 2017). Patients are the main source of information about a hospital system's communication, education, and pain-management processes as they are directly connected with the usage of health services and can report whether they were treated with dignity and respect and if the treatment received met their expectations of care (Cleary, 2003). Patient satisfaction is a multi-aspect concept that describes an attitude derived by a receiver of services as to whether a patient's expectations for services have been fulfilled or not (Hussain et al., 2019). Previous studies have identified the medical service quality as the most influential factor on patient satisfaction (Meng et al., 2018) while other important factors are interactions between medical staff and patients (Ahmad et al., 2015) and nurse-patient relationship (McCabe, 2004). Hussain et al., (2019) identified four factors that contribute to patient satisfaction: doctor services, nurses' services, Registration and Administrative Procedures and waiting time. Aiken et al. (2021) who investigated patient satisfaction with hospital care in England found that patients trust doctors and nurses, however they express low levels of satisfaction of hospital when there were not enough nurses available.

Studies carried out around the world identify different factors affecting the satisfaction of patients and different factors that should be addressed to improve the caring environment. Marama et al. (2018) measured the satisfaction of patients of obstetrics and gynaecology wards in public hospitals in Ethiopia and found that the satisfaction rate was high. However, when asked about other areas such as medications, cleanness and some basic facilities, like hand-washing clients were dissatisfied. The study of Kasa & Gedamu (2019) also in Ethiopia records patient satisfaction concerning professional technical control, affective support and provision of health information, while least dissatisfaction was related to decisional control. Differences in level of satisfaction among participants with different demographic characteristics were also recorded. Priority and cultural factors were found essential to patient satisfaction and the quality of healthcare in Ghana (Ahenkan & Aduo-Adjei, 2017). The relationship between the dimensions of responsiveness and overall patient satisfaction in Tehran, Iran were investigated by Kashkoli et al. (2017). Findings indicate that the quality of basic amenities and respect for human dignity were the most powerful factors influencing patient satisfaction. Patients hospitalized at public hospitals were less satisfied than those at private hospitals. Medical staff's kindness and consideration, physician's practice service and nurse's practice service are the main factors found by Woo & Choi (2021) that influence patient satisfaction and in turn patients' intent to revisit hospitals in South Korea.

A few studies exist investigating patient satisfaction and healthcare quality services in Greece. Priporas, Laspa & Kamenidou (2008) investigated patient satisfaction in seven hospitals. Perceptions of satisfaction are significantly affected by the type of insurance the patients had, the emergent admission and the educational status. Males rate satisfaction higher than females and young people higher than older ones. Xesfingi, Karamanis & Vozikis (2017) focused on patient satisfaction in the Konstantopouleio General Hospital of Athens. Attention to the patients from doctors and nurses, hospital administration and environment are positively correlated with patient satisfaction of in-patients and outpatients. Age is also positively correlated to patient satisfaction. Moderate levels of satisfaction with nursing care recorded by Merkouris, Papathanasoglou and Lemonidou (2003), who highlighted the fact

that dissatisfaction might be due to the circumstances under which care was provided and not nursing staff per se. In a recent study Mitropoulos, Vasileiou & Mitropoulos (2018) found, in consistence with other studies, that communication with nurses and doctors contribute significantly to patients' satisfaction. In contrast, the findings of Niakas, Gnardellisy & Theodorou (2004) show high rates of satisfaction for nursing services. The study also recorded high level of satisfaction of medical and fair rates for hospitality services and facilities. Papageorgiou et al. (2008) who investigated the level of satisfaction of respiratory patients in Greek Intensive Care Units and their caregivers supported that patient satisfaction increases when patient needs are identified and met.

Thus, research on patient satisfaction and healthcare quality describe contemporary conditions in Greek Hospitals (Mitropoulos, Vasileiou & Mitropoulos, 2018) and to our best knowledge only two studies (Mitropoulos, Vasileiou & Mitropoulos, 2018; Xesfingi, Karamanis & Vozikis, 2017) report patients' satisfaction of a Greek general hospital since the financial crisis. The present study aims at contributing to fill this gap in the literature and investigates patient satisfaction of the health services provided by the Pulmonary Clinic of the Public General Hospital of Serres, Greece. For first time the views of the patients and families regarding the access, reception and accommodation during the admission to the pulmonary clinic, medical care, nursing care and upon leaving the pulmonary clinic were recorded.

RESEARCH METHODS

A quantitative approach was adopted in the study. A questionnaire was developed by adopting dimensions and items from previous studies (Naidu, 2009; Weech-Maldonado et al, 2001; Rahmqvist, 2001) to ensure validity and reliability of the study. Five point Likert scales were used for the assessment.

The draft was submitted to twelve experts, doctors, nurses and academics, to determine face and content validity (Dimitriadis et al., 2013; Haynes et al., 1995) and some items were revised and improved. Approval to conduct the study was obtained from the Ethics Committee of Serres Hospital. Primary data were collected from the patients of the Pulmonary Clinic by completing the structured

questionnaire. Respondents were informed that participation in the study was completely voluntary. A convenience sample of 196 patients participated in the study. Data were collected from 07/01/2020 to 16/02/2020.

Four dimensions were used to assess patient satisfaction; namely: access, reception and accommodation upon admission to the pulmonary clinic (12 items), medical care (12 items), nursing care (12 items), and leaving procedure when departing from the pulmonary clinic (5 items). Chronbach's alpha was used to assess the reliability of the dimensions. In all cases Chronbach's alpha is above the recommended threshold 0.7.

The sample consists of 66% men and 34% women. 39% of the sample are over 76 years old, followed by the age groups 61-75 years (24%), 46-60 years (16%) and 16-30 years (14%). A small percentage are aged 31-45 years (7%). The vast majority of the patients in the sample are insured, with only 2% uninsured patients. All the patients in the sample were admitted to the Pulmonary Clinic on an emergency basis and not scheduled.

Regarding their habits 66.3% of patients do not smoke and the remaining 33.7% are smokers. Of the smokers, 12.2% smoke 6-10 cigarettes a day, 5.6% smoke 11-15 cigarettes, 7.7% smoke 16-20 cigarettes and 8.2% smoke more than 21 cigarettes a day. It is noteworthy, that 96.4% of patients do not engage in any sports activity. Of the 7 patients who reported exercising, 5 exercise on a daily base. 59.7% of the patients who do not exercise stated that their health condition does not allow them to exercise while the rest stated that it is a personal choice.

RESULTS AND DISCUSSION

Findings show that the overall patient satisfaction is high with nursing care and medical care rated higher. The findings are in accordance with the findings of Mitropoulos et al. (2018) who found that the communication is the most salient predictor of overall satisfaction of patients' in Greek public hospitals, followed by communication with doctors (Table 1).

Table 1. Satisfaction of patients

	Mean	St. Dev.
Access, reception and accommodation during the admission to the pulmonary clinic	4.39	0.43
Medical care	4.68	0.46
Nursing care	4.69	0.46
Upon leaving the pulmonary clinic	4.39	0.57

Regarding access and accommodation in the clinic, the highest average and therefore the greatest satisfaction was recorded to question assessing the behaviour of the staff that welcomes the patients (Mean 4.78, St.dev 0.46) and the behaviour of the cleaning staff (Mean 4.72, St.dev 0.46). On the contrary, patients are less satisfied with the accessibility of the clinic (Mean 3.88, St.dev 1.14).

Patients were also satisfied with medical care. They stated that the medical staff was very friendly (Mean 4.84, St.dev 0.45), treated them with respect (Mean 4.69, St.dev 0.47), and gave them very informative instructions on their illness (Mean 4.74, St.dev 0.44). On the contrary, the patients stated that the waiting time for the exams was longer than expected and thus they stated that they were less satisfied with this (Mean 4.54, St.dev 0.49).

The highest satisfaction rate was recorded in the dimension that assesses nursing care. The highest average was recorded at the questions investigating the experience of the nursing staff (Mean 4.78, St.dev 0.48), and the fact that the treatment of the patients is done on time (Mean 4.74, St.dev 0.49). Patients are less satisfied with the nursing staff in terms of caring for the personal hygiene of patients (Mean 4.54, St.dev 0.4).

Finally, regarding leaving the pulmonary clinic, the patients stated that they had great help during their movement if needed (Mean 4.47, St.dev 0.56), while they did not have the expected secretarial administrative support of the Hospital (Mean 4.34, St.dev 0.67).

To investigate the effect of gender on the research variables, t-test can be used to compare the means of the two groups.

	Mean	St. Dev.
Access, reception and accommodation during the admission to the pulmonary clinic	4.36 (M) 4.43(W)	0.43 (M) 0.43(W)
Medical care	4.59 (M) 4.85(W)	0.50 (M) 0.30(W)
Nursing care	4.71 (M) 4.65(W)	0.45 (M) 0.46(W)
Upon leaving the pulmonary clinic	4.36 (M) 4.47(W)	0.59 (M) 0.53(W)

Table 2. Satisfaction of patients according to gender (M=men, W=women)

As it is shown in table 3, there is a statistically significant difference as far as medical care is concerned between genders (p = 0.000 < 0.05). More specifically, women appear more satisfied with medical care (Mean = 4.8510) compared to men who had a lower average of 4.5917.

		Levene's Test for Equality of		t-test	ty of Means	
		F	Sig	t	df	Sig (2-tailed)
		1	515.	t	ui	Sig. (2 tuiled)
Access, reception and accommodation	Equal variances assumed	0.75	0.38	-1.13	194	0.25
during the admission to the pulmonary clinic	Equal variances not assumed			-1.13	131.00	0.25
	Equal variances assumed	21.96	0.00	-3.82	194	0.000
Medical care	Equal variances not assumed			-4.46	188.42	0.000
	Equal variances assumed	0.15	0.70	0.96	194	0.33
Nursing Care	Equal variances			0.96	127.41	0.34
Upon leaving the	Equal variances	3.28	0.07	-1.27	194	0.20
pulmonary clinic	Equal variances not assumed			-1.323	143.82	0.18

Table 3. Effect of gender on satisfaction dimensions

Next, in order to study the effect of age on the research dimensions, a parametric One-Way ANOVA was performed. Results are presented at table 4. Results show that the mean values of the dimensions differ between the age categories.

Patients of 31-45 years old demonstrate the highest satisfaction for all four dimensions while older patients, those over 60 years old express the lowest satisfaction.

		Sum of Squares	df	Mean Square	F	Sig.
Access, reception and	Between Groups	4.886	4	1.221	7.439	0.000
accommodation	Within Groups	31.362	191	0.164		
during the admission to the pulmonary clinic	Total	36.248	195			
Madiaalaana	Between Groups	3.268	4	0.817	4.023	0.004
Medical care	Within Groups	38.792	191	0.203		
	Total	42.060	195			
Nursing Care	Between Groups	2.719	4	0.680	3.371	0.011

Table 4. Effect of age group on satisfaction dimensions

Within Gro	ups 38.508	191	0.202		
Total	41.227	195			
Between G	roups 9.818	4	2.454	8.508	0.000
Upon leaving the pulmonary clinic Within Gro	ups 55.102	191	0.288		
Total	64.920	195			

Finally, the patients were asked an overall rate to the pulmonary clinic of the General Hospital of Serres, using a numerical scale from 1 to 10. The clinic overall was rated as excellent (9 or 10) by an overwhelming percentage of patients (79.1% in total). It is also very important that none of the patients rated the clinic 5 or below indicating a general satisfaction with the services provided (Table 5).

Rating	Frequency	Percent	Cumulative Percent
6	2	1.0	1.0
7	6	3.1	4.1
8	33	16.8	20.9
9	87	44.4	65.3
10	68	34.7	100.0
Total	196	100.0	

Table 5. Overall rating of the clinic

All of the patients (100%) who participated in the research would recommend the pulmonary clinic to friends and/or relatives. This fact also gives evidence of patients' satisfaction with the offered services.

IMPLICATIONS

The study aims at investigating health services provided by the Pulmonary Clinic of the Public General Hospital of Serres, Greece, through patient satisfaction. For first time four dimensions were used to access patient satisfaction. The dimensions assess all the patient cycle of care in the pulmonary clinic from access, reception and accommodation upon admission to the clinic, medical and nursing care during hospitalization to leaving procedure when departing from the clinic. The findings of the study show the high levels of the overall patients' satisfaction. Nursing care and medical care were rated higher. These findings are in accordance with the findings of Mitropoulos et al. (2018) who found that the communication is the most salient predictor of overall satisfaction of patients' in Greek public hospitals, followed by communication with doctors. Younger patients are more satisfied compared to older patients and women appear more satisfied than men regarding medical care. This finding is partially in line with the findings of Priporas, Laspa & Kamenidou (2008) who found that males rate satisfaction higher than females and young people than older. On the other hand these findings are in contradiction with the findings of Xesfingi, Karamanis & Vozikis (2017) who found that age is positively correlated to patient satisfaction.

This study highlighted the importance of patient satisfaction as an indicator of service quality. Moreover, the study gives insights into the kinds of changes that are needed to improve healthcare service quality to obtain better health outcomes. Healthcare organizations should take into consideration patients' satisfaction, record regularly patients opinions and attitudes and redesign their services with a patient-centric orientation, so as to meet patients' needs and expectations. Hospital administrators and policy
makers should take into consideration the items scored lower in satisfaction rates and determine quality factors that need to be improved with the aim of increasing patient satisfaction.

As the study was performed before the pandemic it would be very interesting to be replicated in times of COVID 19.

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