Report on the 112 Emergency Number in Cyprus

developed by Rivensco Consulting

Abstract:

The current Research Paper – Report has come to some serious findings regarding the overall operation of the Pan-European 112 Emergency Number in Cyprus. One of the findings is that there is large percentage of the population of Cyprus who is – unfortunately – unaware of the existence, and hence, the value of the specific Emergency Line. Additionally, the current Report has extracted some specific and valuable information about the importance of the professional role of Call Takers in order to enable the best possible service for all those persons are in need, especially those incidents that deal with death and or/violence at any form. The continuous development of the professionals in the sector constitutes a core element in the overall operation and development of the 112 Emergency Line. Support by all European Union Members should become a core element in this attempt as the increasing need for assistance requires such a professional approach.

Key Words: Call Takers, 112 Emergency Line, European Union, Support, Professional Services, Cyprus, eHealth, Communication, Development, Report.

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1. *Introduction*

The current report has been designed and developed Rivensco Consulting, and constitutes an integral part of the ***"One Minute may a life" 2015-2017"*** project. The report concerns the 112 emergency number in Cyprus and its overall development has revealed that in Cyprus there is an extensive availability of emergency services. The specific services have developed special programs in order to enable the public to gain wide knowledge over them, however, this could not be achieved, and hence, public's knowledge is considered to have remain limited.

Furthermore, the report also reveals that despite the massive efforts, too little has been achieved in order to inform the public over the overall operation and usefulness of the 112 Emergency Line. As the report importantly outlines, only a small percentage of the population of Cyprus is aware that the number is available in all European Union countries and it can be used in order to overcome unwanted situations whilst in a different country.

The 112 Emergency number was originally introduced in 1991, becoming a pioneer move for the time then. Since 1991, Emergency Line 112 has become a helpful tool for all nearly 500 million European Union citizens. Its usefulness extents to a large number of services such as the police, fire brigade, medical and paramedical services. *Article 1 of the 91 /396/EEC decision that has originally introduced 112 ordered that:[1] "Article 1 1. Member States shall ensure that the number 112 is introduced in public telephone networks as well as in future integrated services digital networks and public mobile services, as the single European emergency call number. 2. The single European emergency call number shall be introduced in parallel with any other existing national emergency call numbers, where this seems appropriate."*

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[1] COUNCIL DECISION of 29 July 1991 on the introduction of a single European emergency call number (91 /396/EEC). Official Journal of the European Communities No L 217/31

The above Council decision has been the very first step in order to ensure that the Union will have a unified emergency number, despite the fact that the number has been previously used in some countries such as Germany.

The 112 free-call from any telephone, mobile or landline, ensures that all EU citizens have easy as well as equal access to emergency services, hence, the fundamental principle of equality of people on which the structure of European Union has been based on, is now ensured in the specific field. The Commission has issued further instructions in order to ensure the implementation of the decision and acts as the *'middle agent'* between telephone companies/member states on one and the EU citizens on the other hand.

2. *112 Emergency Line in Cyprus*

The Pan-European number of 112 is available in Cyprus in coexistence with the local Emergency number of 199 which used to be the emergency number in the past. Calls to 112 are enabled from all telephone lines and phones, including those ones that do not have an active number. An average 16-seconds is required for answering each call to 112.

An important parameter is that calls are answered in four different languages:

i. *Greek*

ii. *English*

iii. *Arabic*

iv. *Russian*

A 2016 E-communications household and telecom single market survey[2], has revealed that as many as 58% of Cypriots citizens are aware that 112 can be used in all European countries alongside with 199 as the emergency number in Cyprus.

Special provisions have also been designed and implemented for disable people in order to enable their access to the 112 Emergency Line. These provisions include the following in compliance with specific legal international obligations[3]:

i.   Special equipment is provided to blind people.

ii. Deaf people can communicate with other telephone customers using a Telefax machine or the SMS.

The report contains several chapters that focus on analyzing research methods based on specific psychological and sociological factors that influence people's behavior. These factors include the historical development of Cyprus' Emergency Lines as well as the various procedures that had led to the development of protocols that set the parameters of the overall operation of all Emergency Lines in order to accomplish their goals.

It should be noted that the calls are answered by the police department[4] and then they are forwarded to the relevant departments. All operators are part of the police force of the Republic of Cyprus and all relevant training and psychological support for their work purposes comes from the training department of the police force.

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[2] https://ec.europa.eu/digital-single-market)
[3] UN Convention on the Rights of Persons with Disabilities, with special regard to the Concluding Observations of the UN CRPD Committee (2015/2258(INI))
[4] http://www.cyprusworld.eu/cyprus_emergency_numbers.html

3. *The introduction of 112 in Cyprus*

Cyprus 112 Emergency Line was primarily introduced in 2009, however, the traditional 199 was retained in order to enable easier access to the public that was unaware of the existence of the newly introduced number. The introduction of the new 112 number has scientifically increased its use[5]. According to official number provided by the Cyprus Statistical Service[6] as many as 90% of the population of Cyprus are users of mobile phones, hence, making it easier for people to contact the 112 Emergency Line. Specific booklets have been published in order to inform the public which are also available to the population through a number of popular websites[7].

The specific action enables the easy access for non-Cypriots who are not aware of the availability of 112 Emergency Line and are only familiar with their local emergency numbers such as:

i.   *999 for UK.*

ii.   *999 for British bases in Cyprus*

iii. *911 for USA*

iv.   *100 for Israel*

v.   *112 for Russian Federation*

Major International

Emergency Lines

The above countries are mentioned as a large percentage of tourists visiting Cyprus comes from these countries and the introduction of these languages constitutes a major (safety) issue for the country.

The current report importantly reveals that despite the fact that in most European Union countries there is widespread awareness of the existence and operation of 112 Emergency Line, in Cyprus this number is limited to 11%.

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[5] http://www.sos112.be/en/faq-112.html
[6] http://www.mof.gov.cy/mof/cystat/statistics.nsf/index_en/index_en?OpenDocument
[7] https://www.angloinfo.com/cyprus/how-to/cyprus-healthcare-emergencies

According to Cyprus Police any emergency call to 112 will be diverted to the necessary department in order to facilitate better service and eliminate any risks.

A comprehensive list of several Emergency Lines is outlined below:

Table 1: List of Specific emergency numbers in different fields

Narcotics – Drugs Law Enforcement Unit (Confidential Information)	Tel:	1498
Narcotics – Support Against Narcotics Abuse	Tel:	1410
Poisoning and Drugs Information – Drug Information & Poison Control Centre	Tel:	1401
Violence in the family – Association for the Prevention and Handling of Violence in the Family	Tel:	1440
Youth HelpLine – Help Line Youth for Youth	Tel:	1455

Table 2: Police Department

Officer on duty	Tel:	1499
Police – citizens Line	Tel:	1460
Report Forest Fires	Tel:	1407

Table 3: Electrical Supply

Electricity Faults	Tel:	1800
Phone number directory	Tel:	11892

A comprehensive list of emergency numbers can be found at the following link:[8]

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[8] http://www.nicosia24.com/index.php/emergency-telephone-numbers-in-cyprus

4. *Protocol of 112 in Cyprus*

The primary response of a 112 call takes place at the regional police station where the call has been made.

i. *Local Police stations*
ii. *Health Ministry ambulance service*
iii. *Fire Department*
iv. *electricity authority*
v. *Water supply*
vi. *rescue coordination center for air and naval accidents*

112
Protocol
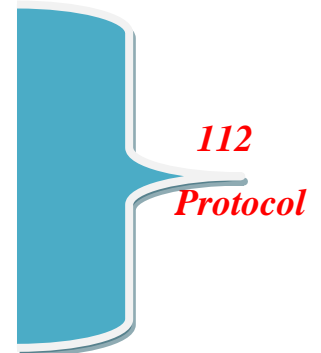
The Protocol for callers in Cyprus aims to gather the following information:

i. *Telephone number from where you are calling*
ii. *Precise location (Street, number, etc.)*
iii. *Type and severity of the incident*
iv. *Data on / victims (e.g. number, sex, age)*
v. *Identify any risks or difficulties to approach the scene*

Protocol

Objectives

The concept of the protocol is to be enable identifying the caller in order to provide assistance if that is necessary. By doing so, the authorities will be able to use Triangulated information, such as information from other people reporting the same incident in order to track the person(s) in need.

4.1. *When should you call 112?*

112 Emergency Line should only be called if it is absolutely necessary and in occasions such as:

i. *ambulance services are required,*
ii. *for the fire brigade or police*
iii. *if you are the victim yourself or you have witnessed a serious incident*
iv. *when you see a burning building or burglary*

4.2.   You should not call 112

For:

i.   *traffic information*

ii.   *meteorological update, or*

iii.   *any other general information*

Unnecessary calls can lead to serious network overloading which could place people in real need in danger. Due to the fact that in the past people without a SIM Card have abused the 112 network countries such as Belgium, Cyprus, France, Slovenia and the United Kingdom decided to block 112 calls from mobile phones without a SIM card.

Further to the Republic of Cyprus registered emergency call numbers, it must importantly be noted that the SBA British Bases in Cyprus have established their own Emergency call numbers on the island in order to enable the public access to assistance in the unlikely case of emergency.[9] The relevant informational document provides a large number of information regarding all the emergency numbers available, and further to the 112 which 'is a Pan-European Emergency number', the 1443 number has also been established in order to provide assistance to non-emergency incidents. The document provides useful information for all people, either living in the specific area or just travelling through.[10] Additionally, special attention is provided for Cypriot nationals residing in the area as information are provided in Greek language.

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[9] Accessing 112 Emergency Services in the SBA and the Republic of Cyprus
[10] www.sbaadministration.org

In an important paper developed by University of Cyprus, the Nicosia General Hospital, and the Archbishop Makarios Hospital[11] a review of three healthcare telematic applications in Cyprus are presented. The Paper focuses on:

1. ***The Ambulance and Emergency – 112 Project*** which aims to develop a specific marketable internal system that will enable the further development of medical care by facilitating the telemedicine services. The project is underway in both Cyprus and the rest of EU countries. The project also aims to focus on providing prioritization (TRIAGE) to victims with serious injuries in order to ensure that they will gain immediate access to health assistance.

2. ***TELEGYN: Telepathology in Gynaecological Cancer [1]*** which focuses on providing assistance to Gynecological cancer patients. This problem has taken a massive dimension during the past few years and special programs have been developed in order to confront the problem. As it has been stated in the paper, the main objective of the program is to *"is to establish a telepathology network in gynaecological cancer which will offer online dynamic intraoperative and postoperative consultations between a panel of experts using the network to transmit video (laparoscopic scenes), still images (histopathologic specimen images), and clinical data."* (p.1)

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[11] University of Cyprus, the Nicosia General Hospital, and the Archbishop Makarios Hospital: Experience with Healthcare Telematics in Cyprus Pattichis (2010) C.1; Kyriakou E. 1, Pitsillides A.1, Samaras G.1, Schizas C.N.1, Neophytou M.1, Antoniades A.2, Kouppis A.2, Tanos V.3, Jossif A.4

3. ***DITIS*** constitutes the third – and final – project which has been examined within the scope of the specific paper. DITIS constitutes an indeed pioneer project as it focuses on the crucial element of communication which can be considered as an integral part of contemporary medical practice. The project focuses on eliminating the time needed to communicate between the cancer patients and their family on the one side and the doctors on the other side. DITIS had a great impact on the quality of life of cancer patients and their families and for that reason the project has been ranked within the top-25 out of a total 179 EU projects.

The final upshot extracted from the above Paper is that a lot has been done in order to develop adequate programs, however, a lot more can be done and that requires the cooperation of both public and private sector, even volunteer NGO's. As it is stated by the Paper *"Cyprus should accelerate its pace in medical informatics and healthcare telematics to benefit the whole of the health care sector thus enabling the offering of a better service to the citizen" (p.2)*

A recent (2014) joint report by the *University of Nicosia and the University of Cyprus* has led to the following findings which are considered as crucial for the operation of the 112 Emergency Line:[12]

i.   Rapid advances in information technology (IT) and telecommunications and their convergence (telematics) have led to the development of a brand-new type of health approach, the famous eHealth. The research has suggested new ways of promoting eHealth including the extension of 'Evaluation Metrics for Smart Houses (SHs).

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[12] Evaluation Metrics for eHealth Services and Applications within Smart Houses Context
file:///D:/ACADEMIC/ERASMUS%20MP/Evaluation%20Metrics_final_55970245.pdf

ii.   By applying new methodologies that will ease the access to the services and will also provide the overall eHealth system with new competencies based ion specific parameters which are considered crucial for further research as well as application in the real battlefield of eHealth. These parameters are *"Confidentiality, Security, Availability, Ease of Information Sharing, Expandability and Awareness" (p.247)*

Despite the efforts by the Cyprus Health Services in order to promote the use of sophisticated Health Information Systems (HIS) it seems that too little has been achieved and the program has been considered as a failure despite the clear identification of the Ministry of Health in Cyprus which states that: *"The European Union is promoting a "European e-Health Area ", while coordinating different actions and facilitates synergies between related policies and stakeholders in order to find better solutions and to spread best practices between Member States."[13]* Consequently, a lot more has to be done and most professional in the Health sector strongly support that such an approach can only take place through a comprehensive National Health System.

5. *The Health Information System of the Ministry of Health*

5.1. *Health Information System (HIS)*

The Health Information System of the Republic of Cyprus commenced in 1989 as a co-project between the Ministry of Health of the Republic of Cyprus and the East Mediterranean Region Office (EMRO) of the World Health Organization (WHO).

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[13] http://www.moh.gov.cy/moh/cbh/cbh.nsf/page20_en/page20_en?OpenDocument&print © 2013 - 2014
Ministry of Health - Republic of Cyprus, N.C.P. on the application of Patients' Rights on Cross Border Healthcare

Since then, many other dates can be considered as a milestone for the further development such as the 2013 meeting[14] in which the then Minister of Health of the Republic of Cyprus hosted negotiations with the WHO in which *"The Minister and WHO agreed on a number of concrete steps to expand collaboration for WHO to assist the Ministry in formulating evidence-based policy decision and monitoring the impact of the reforms. WHO is synergizing its work with that of the World Bank in Cyprus."* Such actions have enabled the gain of expertise and know-how from leading countries in the field of HIS.

As a sequence of these actions the *Patient Administration System (PAS)* had been developed as a pilot program in 1991 based at Archbishop Makarios III Hospital in Nicosia. The program was successfully completed in 1993 and the evaluation by both the WHO and the Ministry of Health in Cyprus was positive. Based on the pilot program PAS was further established in all major hospitals in Cyprus providing both professionals and patients with great support leading to better performance.

It is estimated that until 2007 as many as *"760 employees have been trained from all the hospitals, 80% of them are nursing personnel, about 20% administrative staff and a small number are medical staff."[15]* However, the recent banking and financial crisis that massively hit the country has led to the reduction of the budget of the Ministry of Health. Hence, no further valid data could be extracted in order to enhance the findings pf the present report.

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[14] WHO meeting with the Ministry of Health in Cyprus
http://www.euro.who.int/en/countries/cyprus/news/news/2013/10/who-meeting-with-the-ministry-of-health-in-cyprus
[15] Selected eHealth Applications in Cyprus from the Training Perspective (2007) A. Jossif1, C. S. Pattichis2, M. Kyriakides3, A. Pitsillides2, E. Kyriacou 2, M. Dikaiakos 2
http://linc.ucy.ac.cy/publications/pdfs/2007_selected_eHealth_applications_in_Cyprus.pdf

Further to the previous information, the Ministry of Health in cooperation with the Ministry of Finance have designed, developed, and finally implemented a specific program in order to establish a soft-ware for an Integrated Health Care Information System (IHCIS). The system was finally implemented in several hospitals New Nicosia General Hospital and the New Famagusta General Hospital. The IHCIS consists of the following 13 modules:

1. *Patient Administration,*
2. *Electronic Health Care Record,*
3. *Hospital Order Entry,*
4. *Clinical Laboratory,*
5. *Radiology/PACS,*
6. *Billing,*
7. *Stock Control,*
8. *Prescription Management,*
9. *Personnel Management,*
10. *Blood Bank,*
11. *Health Smart Card,*
12. *Histopathology, and*
13. *Coding and Classification of clinical terms.*

IHCIS 13 Modules
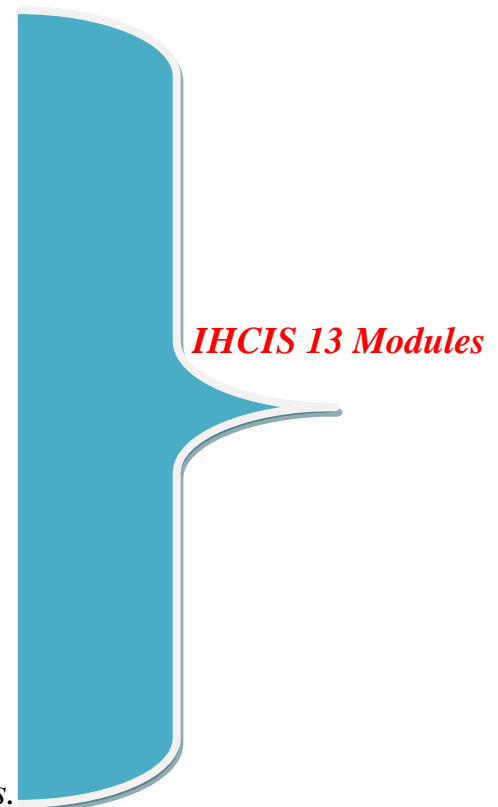
The program evaluation tales place in a rolling procedure in order to enable the tracking of possible problems in order to employ any needed action for correction. The first evaluation took place in 2007 with positive outcomes. *The software program is currently supported by IT specialists form IBM and SAP*[16]

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[16] Cyprus Ministry of Health improves hospital services with IBM and SAP: http://www-07.ibm.com/innovation/my/exhibit/documents/pdf/Cyprus%20Ministry%20of%20Health.PDF

The IT Manager of Nicosia General Hospital Evi Yiapatou stated that: *"The combination of IBM Global Business Services consulting and technical skills, supported by the IBM System x server technologies, helped us to build an integrated and effective solution combining both SAP and non-SAP applications that is dramatically improving our ability to offer effective and efficient healthcare to the people of Cyprus." (p.2)* Until the end of 2010 over 320.000 patients had been served through the specific software.

5.2. INTERREG III B Archimed Program:

Further to the HIS, an additional program was developed on a pilot basis at the Paphos General Hospital. INTERREG III B Archimed Program[17] project entitled "A Mediterranean Research and Higher Education Intranet in Medical and Biological Sciences" is a project which has been developed due to the joining of forces between the University of Cyprus the Ministry of Health and the Paphos General Hospital. The program focuses on bringing together research and educational centers from different Mediterranean countries such as Cyprus Greece and Italy. These countries share a lot in common with a strong cultural background which inevitably expands to medical issues. The program uses sophisticated intranet network in order to share information, hence making it useful for all participants.

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[17] Selected eHealth Applications in Cyprus from the Training Perspective (2007) A. Jossif1, C. S. Pattichis2, M. Kyriakides3, A. Pitsillides2, E. Kyriacou 2, M. Dikaiakos 2
http://linc.ucy.ac.cy/publications/pdfs/2007_selected_eHealth_applications_in_Cyprus.pdf

6. *Emergency Telemedicine: the AMBULANCE and EMERGENCY-112 Projects*

The availability medical assistance can meaningfully improve health care services at understaffed rural or remote areas. The provision of effective emergency telemedicine and home monitoring solutions are the major fields of interest of *AMBULANCE HC1001 and EMERG-ENCY-112 HC4027 projects that were partially funded by the European Commission/ DGXIII Telematics Application Program.*[18] The aim of the AMBULANCE project was the development of a portable emergency telemedicine device that supports real-time transmission of critical biosignals as well as still images of the patient using the GSM link.

6.1.   EMERGENCY-112, which was the ex-tension of the AMBULANCE project, aimed to extend the system to an integrated system which would be able to operate over several communication links (Satellite, GSM, POTS, ISDN, LAN, etc.) The system comprises of two different modules: i) The patient unit which is the unit located near the patient. This unit can operate automatically and has several operating features (depending on the case used). ii) The physician's unit which is the unit located near the expert doctor. This unit can be either fixed or mobile depending on the place where the expert doctor is located. Still images of the patient's position and state are captured through a small camera and trans-mitted.

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[18] EUROPEAN COMMISSION DG-XII SCIENCE RESEARCH & DEVELOPMENT: SYNOPSES OF TSER PROJECTS FUNDED AS A RESULT OF THE THREE CALLS FOR PROPOSALS (1995/1996-1997/1998)

The specific system was evaluated and verified in several EU countries including Cyprus. The evaluation of the system took place under prerequisite criteria which ensured its validity and credibility. These criteria included time indicators, such as time-to-transportation, time-to-start-treatment, time-to-stabilization, etc., in a total of 100 cases in which the system was used and in another 100 cases without using the system, in order for comparative results to be deduced. It was shown that the system provides significant support to the early and specialized pre-hospital patient management and to emergency case survival. Severe or multiple trauma patients were better assessed, while the electronic registration of the patient's data freed the ambulance personnel of any paperwork and helped them devote more time to real emergency care.[19]

The program divided users according to their age which was between 25-50 years old and also their Computer level expertise. Initial training lasted approximately 30 minutes for beginner and expanded to one hour for inexperienced users. Although the system was positively evaluated by the Cyprus authorities, it has not yet been implemented as part of the Cyprus Health System. This is expected to be reviewed within the planned Health System as well as a part of the revitalized based on a new INTERREG III B Archimed Program project entitled *"An INTEgrated broadband telecommunication pilot teleservices-platform for improving health care provision in the Region of MEDiterranean"[20]* which has recently been awarded to the University of Cyprus and the Paphos General Hospital.

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[19] California Health Care Foundation: Using tracking tools to improve patient flow in hospitals (2011) http://www.chcf.org/

[20] http://www.medinfo.cs.ucy.ac.cy/index.php/projects/completed-projects

7. *DITIS: Home Healthcare of Cancer Patients [8-11]*[21]

DITIS (ΔΙΤΗΣ, in Greek, stands for: Net-work for Home HealthCare Collaboration) is a system that supports virtual healthcare teams dealing with the home-healthcare of cancer patients in Cyprus. DITIS has been initially developed in order to effectively overcome obstacles between communication and continuity of assistance between the home-healthcare multidisciplinary team (of the Pancyprian Association of Cancer Patients and Friends, PASYKAF) and between the team and the oncologist often over 100 km away. DITIS supports the creation, management and co-ordination of virtual healthcare teams, for the continuous treatment of the patient at home. Thus it has offered improved quality of life to the patient, for example by offering the nurses the possibility of immediate authorization to change prescription via mobile devices and the oncologist the possibility of assessment and symptom control without having to see the patient.

DITIS was initiated in 1999 as a two-year research project and has since been funded by a number of organizations:

i.   The Cyprus Research Promotion Foundation, the University of Cyprus, and the Cyprus Association of Cancer Patients and Friends (PASY-KAF).

ii.   Cyprus Telecommunications Authority (CYTA),

iii.   Cambridge Microsoft Research Labs,

iv.   NetU consultants Ltd,

v.   WinMob Technologies Ltd,

vi.   Ericsson (through S.A. Petrides Ltd),

vii.   Cyprus Development Bank (CDB).

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[21] Selected eHealth Applications in Cyprus from the Training Perspective (2007) A. Jossif1, C. S. Pattichis2, M. Kyriakides3, A. Pitsillides2, E. Kyriacou 2, M. Dikaiakos 2
http://linc.ucy.ac.cy/publications/pdfs/2007_selected_eHealth_applications_in_Cyprus.pdf

8. *Concluding Remarks*

The current paper reviews in deep eHealth applications in Cyprus was presenting both success or failure based on their training activities. Different methodologies for training were used ranging from classical approaches such as the professional training of the trainers, using demo cases followed by personal training, group training, and workshops, to more recent methodologies based on eLearning sessions including teleconsultations. The training was carried out successfully in all cases. However, not all eHealth systems were put into practice successfully, mainly for reasons not related to training.

Cyprus should accelerate its pace in eHealth services for the benefit of the whole healthcare sector. A critical factor in achieving this is training the physicians, the paramedical and administrative staff in emerging information technologies in healthcare. Training these personnel should include concepts like electronic patient record, web-based systems, security, teleworking, and other. Linked with the training, there should be 24-hour support for the medical staff in the hospital, clinical systems, or home care under operation. Furthermore, based on the recommendations of the WHO report on eHealth Tools & Services[22] Cyprus should consider investing heavily on eLearning methods in health sciences, which will provide the country with a serious advantage for both the development of the awareness about the benefits of eHealth as well as becoming an international medical center in the region of Mediterranean. The final upshot is that the emergency number 112 gained a high response rate in Cyprus, however, a lot more work needs to be developed regarding the operators in order to have all the physical and psychological support needed to successfully accomplish their professional and personal mission.

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[22] s TOOLS & SERVICES eHealth WHO Needs of the Member States. Report of the WHO Global Observatory for eHealth.

9. *The Role of Psychology Training for the operator 112*[23]

9.1. *EENA Operations Document – Psychological support of 112 call takers* provides the framework and the guidelines regarding the role of psychology in connection with the professional training of 112 Emergency Line operator. The major objective of the document is to describe the main issues related to the psychological aspects, needs and support of 112 call takers.

9.2. *Abbreviations and Glossary*

In order to enable top-quality training, a special Glossary has been developed in order to assist 112 call takers. Some of the Glossary is listed below:

ALS – Advanced Life Support (ALS)

AVL – automatic vehicle location

BLS – Basic life support

EC - European Commission

EU – European Union

AN Answering Points

UN - United Nations

WHO – World Health Organization

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[23] EENA Operations Document Training of 112 call takers
http://www.eena.org/uploads/gallery/files/operations_documents/2012.010.22.3.3.3.trainingof112calltakers.v1.0.pdf

9.3. *The role of the call taker*

The role of the call taker is crucial in the case of emergency for both people in need as well as the workers as the situations bring them in an emotionally difficult position. It is indeed important for call-takers to be aware of how they will deal with these difficult situations in a professional manner. How do call takers use rational and formal procedures as well as non-formal, intuitive and emotionally based, individual processes to make their decisions and how can they be effectively supported in the decision-making process? These questions constitute major issues that need to be addressed in order to enable better performance and greater results.

9.4. The 112 service chain defines the basic framework of tasks and thus the context[24], in which we can start searching for answers to these and other relevant questions.

The Emergency Alarm Sequence:

The response interval of the public:

    i. The incidence occurs

    ii. The emergency call is made

The emergency response interval:

    i. The call is answered by the service

    ii. A need is identified

    iii. A priority is decided

    iv. A response is defined

    v. The response/resource is dispatched

    vi. Assistance may be given online if indicated

    vii. The call is terminated

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[24] Body of European Regulators for Electronic Communications: Report on OTT Services (2015)

Triage of incoming calls is a major issue for professional call takers involves the triage of incoming calls and that action requires special training, enormous patience, and finally, independency from feelings. Call takers should prioritize calls according to the seriousness of the incidence.

As such, they must be able to:[25]

    i.   Obtain critical information and route the call as quickly as possible

    ii.   Make quick decisions and react with reason

    iii.   Properly assess calls to determine whether they are of an emergency or non-emergency nature

    iv.   Gather critical information

    v.   Enter information into the CADS system

    vi.   Remain calm, professional, courteous, and respectful

It is essential that deciding on how to proceed, or when to interrupt the established process, requires the critical judgment and thinking behalf the call taker.

Additionally, the call taker is responsible for the management and work assignment (in some cases physicians and supervisors provide the work direction)[26] In many occasions, call taker are responsible for managing multiple response resources simultaneously and providing first aid guidance (basic or advance life support) or other potentially live saving advice to the caller.

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[25] Emergency Call Taker Job Description: http://www.911dispatcheredu.org/911-call-taker/

[26] Physician Assistants in Ontario: Roles and Responsibilities of Physicians Supervising Pas https://www.oha.com

The call taker is generally also responsible for providing information support to the responding resources. This may involve:

  i.   clarifying the exact location of the emergency/patient,
 ii.   requests from the onsite rescue services crew to provide support resources,
iii.   additional ambulances, rescue equipment, or a helicopter.

The call taker also plays a key role in the safety of staff onsite. They are the first with the opportunity to assess the situation that the crew is responding to, will maintain contact on the scene in order to monitor crew safety, and are frequently responsible for requesting emergency police response to 'back up' paramedics when they encounter a violent situation.

An important action that any call taker shall bear in mind is that all relevant incident information regarding each call must be treated within the legal parameters set by each country as records may often become a subject of interest in legal proceedings and may the call taker be called before the Court of Justice.[27]

10. *Decision Making in Emergency Settings*

Making fast decisions and analytic decision making draws on different assumptions of how information is processed. "Even though reason-based and non-reason-based conceptualisations may be grossly oversimplified depictions of these phenomena, they have earned attention across research programs"[28] and it has also been brought up in the emergency room context[29].

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[27] EENA Operations Document Training of 112 call takers
[28] Kahneman, D. (2003) Maps of Bounded Rationality: Psychology for Behavioral Economics: The American Economic Review, 93(5), pp. 1449-1475, December 2003
[29] Sloman, S. (1996) The Empirical Case for Two Systems of Reasoning, Brown University Psychological Bulletin 1996, Vol. 119, No. 1,3-:22 Copyright 1996 by the American Psychological Association, Inc. 0033-2909/96/$3.00

According to *Coget and Keller (2013)*[30] *Decision-making can be hampered and stress-levels increased by lack of available resources and institutional support…"*

11.***Psychological aspects of emergency call taking***

Emergency call takers listen to callers describing mundane problems but also to callers describing severe accidents, agony and deaths. It is unusual that emergency call takers will come across deadly incidents and that requires special training in order to assist all persons involved, remain calm, and act in a professional manner.[31]

It is hence essential that call takers need to develop specific competencies in terms of medical, technical, and emotional skills coupled with educational and psychological support. A recent study[32] that took place in Blekinge Institute of Technology, in Sweden, has importantly revealed that that "individual skills, knowledge, experience, sensitivity, insight, empathy and intuition helped bridge the difficulties related to the call taking tasks."

A seemingly simple task of call taking requires a fast, effective and flexible coordination of mental processes. Each call requires flexibility and mental ability in order to overcome difficulties of the given situation. Imagination and ability to memorise are only some of the abilities that call takers need to develop. The task of call taking integrates several professions and places high demands on the mental processes, condition and personality of the call takers.

[30] Coget, J.F., & Keller, E. (2013) The Critical Decision Vortex: Lessons From the Emergency Room. Journal of Management Inquiry July 1, 2013 22: 342-355.

[31] Christoph HR Wiese, Andrea Vossen-Wellmann, Hannah C Morgenthal, Aron F Popov, Bernhard M Graf and Gerd G Hanekop (2008) Emergency calls and need for emergency care in patients looked after by a palliative care team: Retrospective interview study with bereaved relatives. BMC Palliative Care20087:11
DOI: 10.1186/1472-684X-7-11© Wiese et al; licensee BioMed Central Ltd. 2008

[32] Svensson, M. (2014) Routes, Routines and Emotions in Decision Making of Emergency Call Takers. Doctoral Dissertation in Industrial Economics and Management. www.diva-portal.org

The complexity factors of the call taker tasks can be divided into 3 groups:[33]

1. Mental workload and decision-making, based on possibly unreliable information,

2. Interpersonal complexity, due to the necessity of obtaining trust

3. Demand factors related to time and energy.

11.1. *Stress factors in call taking can include:[34]*

i. Feelings of helplessness in critical situations

ii. Competing demands for executing rapid and precise

iii. Frequent Emergency Line abuse,

iv. Frequently disrupted functioning of support systems

v. Lack of necessary resources (such as ambulances)

vi. Problems in the organisation of work, overload of tasks

vii. Inadequate formal training

viii. Enduring lack of public acknowledgment

**Stress Factors** *in call taking*

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[33] Reed, S.C. (1996) SOME RELATIONSHIPS BETWEEN CONCEPTUAL COMPLEXITY AND MENTAL ABILITIES Educational Testing Service, Princeton, New Jersey

[34] Work related stress - www.betterhealth.vic.gov.au

As illustrated on the graph below,[35] an increase in stress results in an increase of productivity – up to a point, after which things go rapidly downhill.

The peak-point is different for each individual, and hence, this needs to be adjusted and viewed within this framework.

Adapted from: Nixon, P: Practioner, 1979.
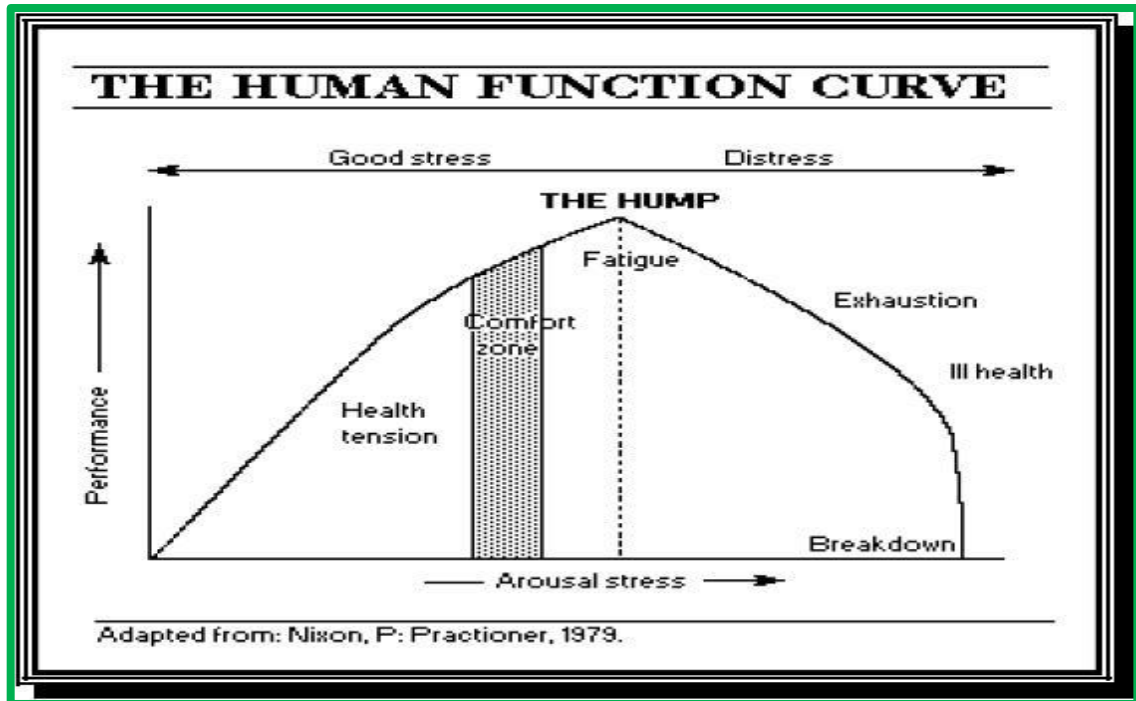
11.2. *Stress management methods may include the following:[36]*

i. muscle relaxation,

ii. meditation,

iii. biofeedback and

iv. cognitive strategies,

Stress Management Methods

The development of stress management programmes at (PSAPs)[37] should be based on a complex analyses of the exposure of employee target groups to stress factors in the defined settings and task context, the work setting ergonomics and result in comprehensive actions, embedded in the institutional human resources management strategies.

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[35] Nixon P. Practioner, 1979

[36] Workplace Stress -General 'Can workplace stress be defined?' – Canadian Center for Occupational Health and Safety www.ccohs.ca

[37] EENA Operations Document: Managing Human Resources in a PSAP (2015) www.eena.org

11.3. *Symptoms of work-related stress:*[38]

The role of the 112 call takers is crucial at the attempt to successfully address an emergency incident. However, several related stress symptoms may cause problems for the call takers. These problems are:

i.   Fatigue
ii.   Muscular tension
iii. Headaches   ***Physical Symptoms***
iv.   Heart incidents
v.   Sleeping difficulties

vi.   Depression
vii. Anxiety
viii. Discouragement   ***Psychological Symptoms***
ix.   Irritability

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[38] Work related stress - www.betterhealth.vic.gov.au

All the above constitute serious issues that need to be addressed within a wider HRM development as HR is – and should be considered as a valuable asset and not as an expense.[39] Further academic research has revealed the role of HR development of call takers[40] and the future of the professionals in the sector in the following decades. Additionally, *Daft (2008)[41] and (2010)[42]* has repeatedly focused on the Motivation issue in order to enhance performance as money is not the only factor taken into account by professionals in any sector.

11.4. *Call taker coping strategies in disaster management context*

As call takers have an extremely serious mission to complete, and since several symptoms affect their job, it is inevitable that these issues need to addressed within a professional framework. Taking into consideration that the several issues may range from severe to minor and having an awareness of the potential deployment environment, conditions, duties, and constrains the need for introducing such a framework is increasingly important.

Hence, the following actions are suggested:[43]

    i.   *Sleep/work schedule*

    ii.   *Nutrition*   **Call Takers Coping Actions**

    iii.   *Exercise*

    iv.   *Avoid Alcohol/Drugs*

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[39] Collier, P. (2003, 2007, 2009, 2013) Accounting for Managers: Interpreting accounting information for decision-making (1st Ed.) John Wiley & Sons, West Sussex, UK

[40] Newton, A. (2013) Ambulance Service 2030: The future of Paramedics – University of Hertfordshire

[41] Daft, R.L. (2008) New Era of Management (2nd Ed.) Thomson Higher Education. Mason Ohio, USA

[42] Daft, R.L. (2010) Management: Strategy Formulation and Implementation. Copyright ©2010 by South-Western, a division of Cengage Learning.

[43] Source: Disaster Preparedness for TERT Members - Participant Guide v5.0

Additionally, further actions shall enable call takers to maintain an effective attitude in order to complete their task:[44]

  i.   Humor

  ii.   Breaks

  iii. Think About Other Things

  iv.   Take a Deep Breath and Relax

  v.   Remember, It Could Be Worse

  vi.   Talk to Others

  vii. Out of Place, Out of Mind

In order to achieve all the above, specialist have repeatedly recommended specific actions that have been proven to be effective.[45]

  i.   Deep breathing

  ii.   Mental relaxation

  iii. Tensing the Muscles

  iv.   Mental Imagery

Additionally,[46]

  i.   The development of self-Motivation,

  ii.   Introduction of self-control

  iii. Development of social skills such as empathy

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[44]Source: Keane, T.M. & Piwowarczyk, L.A. (2006). Trauma, terror, and fear: Mental help professionals respond to the impact of 9/11 – an overview. In L.A. Schein, H.I. Spitz, G. M. Burlingame, and P.R. Muskin (Eds). Psychological effects of catastrophic disasters. Binghamton, NY: Haworth press.
Beaton, R., Murphy, S., Johnson, C., Pike, K., & Cornel, W. (1999). Coping responses and posttraumatic stress symptomatology in urban fire service personnel. Journal of Traumatic Stress, 12(2), 293-308.
McCammon, S., Durham, T.W., Allison, E.J., & Williamson, J.E. (1987). [Cited by: EENA Operations Document Psychological support of 112 call takers
[45]Beiman, Irving; Israel, Eileen; Johnson, Stephen A. Journal of Consulting and Clinical Psychology, Vol 46(2), Apr 1978, 314-321. http://dx.doi.org/10.1037/0022-006X.46.2.314
[46] Emmons, Robert A. New York, NY, US: Guilford Press The psychology of ultimate concerns: Motivation and spirituality in personality. (1999). ix 230 pp.

All the above enable higher performance and better self-job satisfaction as the mental preparation for disaster deployment is a key success factor for the job achievement and accomplishment.[47]

11.5. *Psychological intervention possibilities*

A set of tools has been suggested by several scholars in order to address these issues:[48]

i. *Critical Incident Stress Management,* which is an intervention protocol developed specifically for dealing with traumatic events. (police, fire, ambulance, emergency workers and disaster rescuers)

ii. *Debriefing* is a proactive intervention involving a group meeting or discussion about a particularly distressing critical incident.

iii. *Defusing* is an intervention that is a shorter, less formal version of a debriefing.

iv. *Grief and Loss Session is* a structured group or individual session following a death and assists people

v. *Crisis Management Briefing is* a large, homogeneous group intervention used before, during and after crisis to present facts

vi. *Critical Incident Adjustment Support* provides multi-faceted humanitarian assistance

vii. *Pre-Crisis Education* provides a foundation for CISM services.

viii. *Individual crises intervention* while dealing with crisis, both personal and societal, there are five basic principles outlined for intervention.

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[47] 2011–2012 Criteria for Performance Excellence: The Malcolm Baldrige National Quality award. Baldrige Performance Excellence Program National Institute of Standards and Technology • Department of Commerce

[48] Suzanna Rosea, Jonathan Bisson, Simon Wessely (2003) A Systematic Review of Single-Session Psychological Interventions ('Debriefing') following Trauma. Psychother Psychosom 2003; 72:176–184

11.6. *Trainings and workshops*

In order to create a much needed team-spirit which plays an important role both in personal and professional life special training workshops are essential to be developed:[49] The potential benefits are:

i.   Staff members becoming more confident in their ability to manage crisis situations,[50]

ii.   Staff members and supervisors adopting a more consistent approach to callers in crisis, thus providing higher quality support/service;

iii. Staff members obtaining increased knowledge of crisis intervention and management techniques

iv.   Selected supervisory staff members obtaining basic and sophisticated techniques to conduct effective and long-lasting training programs, benefiting the human resources of the PSAP.

The value of training workshop cannot under any circumstances be undermined and this is an action that is highly recommended by specialists in the sector as *"Training represents a prime opportunity to expand the knowledge base of all employees, but many employers find the development opportunities expensive."[51]*

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[49] DAGMAR RECKLIES (2015) How do you build true team spirit? Definition, Benefits, and Risks of Team Spirit http://www.themanager.org/2015/06/build-team-spirit/

[50] Emergency preparedness & support team LEADERSHIP in EMERGENCIES TOOLKIT https://hr.un.org/sites/hr.un.org/files/Leadership_in_Emergencies_Toolkit.pdf

[51] Frost, S. (2016) The importance of Training & Development in the Workplace www.smallbusinesses.chron.com

Additionally, executive training sessions can lead to:

i.   Addressing weaknesses

ii.   Improve Employee Performance

iii.   Consistency of Actions   *Positive effects of*

iv.   Employee Satisfaction   *Training sessions*

v.   Higher productivity

Other academics that have also addressed the issue of Training and came to the conclusion that employees will resist training as it is a disruption to the normal life, despite that employers are ready to invest in their training.[52] It is hence essential for professional call takers to engage themselves in constant training in a professional manner in order to develop their skills and become more effective and efficient in a field that is crucial for people's lives.

A 112 Emergency Line Workshop in Sweden[53] has found some important positive outcomes and enable the participants to expand their views over the importance of their job and mission and also to develop their professional skills.

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[52] McDade, C. (2013) [HR specialist] Why Employees Should Want to Attend Training Workshops. Tough Nikel www.toughnikel.com

[53] Effective handling of Emergency Calls (2002) Rosersberg, Sweden. Swedish Rescue Services Agency. Fire & Rescue Services Department www.ec.europa.eu

12. *Ergonomics of call taking*

12.1. *Call taker perspective*

The profession of call takers is being taken up by staff with varying educational profiles across Europe. Scope of experiences, the knowledge base and professional skills of a call taker have a direct impact on the performance of the complex set of tasks and the quality of support provided to the callers and rescue services involved in intervention. European Union has paid attention to the importance of the specific skills that are essential and, hence, required, for the accomplishment of specific jobs[54] and has set the parameters that are important to attract the most suitable ones. These parameters include:

i. Financial incentives for employees
ii. Financial incentives for employers
iii. Future prospect development
iv. Creativity
v. Strategic thinking

Job Incentives

It is indeed important to provide employees in such a crucial sector such as the 112 Emergency Line with the best possible incentives. Financial compensation is a major issue, however, this is not the only one as many scholars have focused on issues such as Motivation at work[55]

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[54] SWD(2012) 375 final: COMMISSION STAFF WORKING DOCUMENT Vocational education and training for better skills, growth and jobs Accompanying the document Communication from the Commission Rethinking Education: Investing in skills for better socio-economic outcomes http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52012SC0375&from=EN

[55] F Herzberg, B Mausner, BB Snyderman – (2011) The motivation to work. Transaction Publishers, New York USA, London UK.

According to research the call takers most often complain about problems associated with increased noise, long-term use of headsets, swelling feet due to lengthy sitting and complicated interaction (communication) with other team members due to the working stations placement.[56] Thus, call center ergonomics are another crucial factor determining the well/being and performance of call takers.

12.2. *Call center ergonomics*

Call centers have a unique working environment characterized by working practices that can present hazards, and systems of work that differ from those of other computer-based office jobs and can potentially influence the wellbeing and performance of call takers.[57] Creating an ergonomically correct call center can help workers avoid such discomforts and injury. Ergonomics can be used to improve the well-being and productivity of workers by ensuring that workstations and work methods are designed to meet their needs and capabilities and thus conducting ergonomic analyses of the emergency call center and addressing potential hazards and risks systematically is highly recommendable.

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[56] Rockville (MD): Substance Abuse and Mental Health Services Administration (US); 2014. Trauma-Informed Care in Behavioral Health Services. Treatment Improvement Protocol (TIP) Series, No. 57 Center for Substance Abuse Treatment (US).
[57] http://unionsafe.org.au/hazards/call-centres/

Psychological load together with fatigue resulting from physical discomfort are important factors of work performance. [40]Call center workers usually need to sit for extended periods of time doing several tasks on the computer and phone. Advanced technology in call centers enabled speed and accuracy, however, with all its benefits, technology in the call center can also take a toll on workers in the form of physical ailments, such as muscle soreness, lower back pain, and eye fatigue.

12.3. *Policy context*

Several national legal frameworks *(such as Occupational Health and Safety Acts)*[58] and human resources management standards, setting out the legal and institutional obligations for various parties in the workplace. The purpose of the legislation is to prevent injury and illness in the workplace.

Examples of the regulations include the obligation of employers to ensure that:

   i.   Sufficient workspace is provided to allow persons to work safely;
  ii.   Floors and surfaces are constructed and maintained to minimize the possibility of slips, trips and falls;
 iii.   Persons are not hindered and able to move safely around a place of work.

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[58] Health and Safety at Work etc. Act 1974 http://www.hse.gov.uk/legislation/hswa.htm

12.4. Potential Hazards

Any workplace may present hazards to a worker's physical and/or psychological health and safety.[59] The following refers to some hazards within call centers, however, these are not an exhausting list.

   i.   Workstation design and ergonomics

  ii.   Working space

 iii.   Lighting

 iv.   Ventilation

  v.   Telephone headset use

 vi.   Manual handling tasks

vii.   Psychological environment.

Potential Hazards for 112 call takers

12.5. When looking for hazards employers should consider

There are many types of workplace hazards, which tend to come under four main categories:[60]

  i.   Physical Hazards

 ii.   Ergonomic Hazards

iii.   Chemical Hazards

iv.   Biological Hazards

Workplace Hazards

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[59] What is risk assessment? https://www.ccohs.ca

[60] Fit for Work: Identifying workplace hazards http://fitforwork.org/employer/preventing-absence/health-and-wellbeing-at-work/identifying-workplace-hazards/

In order to avoid all the above, specific measures need to be implemented in a professional manner. These measures may include the following:

i.   Develop safe work procedures

ii.   Communicate and consult with employees

iii. Provide training for employees

iv.   Supervise employees

Hazards may change from time to time as the workplace and procedures change. Employers should thus set up a routine of periodic hazard checks and establish a date to review the entire risk management process. It is crucial to recognize the importance of organizational climate for both contributing to and mitigating the effects of occupational stress for emergency call takers.

13. *Challenges and issues for 112 services - Economic context*

There is emerging evidence that emergency call takers regularly experience a range of both daily stressors and critical incidents that are similar to those faced by their communications operator counterparts.[61] They also report additional stressors that are specific to the nature and scope of their work. The occupational stress literature increasingly points to the centrality of organizational factors in both exacerbating and mitigating the effects of such stressors.

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[61] Tom Sterud, Erlend Hem, Øivind Ekeberg, Bjørn Lau (2008) Occupational stressors and its organizational and individual correlates: A nationwide study of Norwegian ambulance personnel. BMC Emerg Med. 2008; 8: 16. Published online 2008 Dec 2. doi: 10.1186/1471-227X-8-16

Given the individual and organizational costs, there is an urgent need to include this employee target group in empirical, theoretical and intervention efforts that address these issues. Suggestions drawn from research indicate that the organizational structure of PSAPs can be a powerful conduit for change in reducing distress and improving employee morale and performance and this is an important factor of institutional and economic sustainability of the 112 systems.

14. *Conclusion*

The 112 Emergency Line is an important tool for the safety of all European citizens or those who are visiting the Union, or travelling within it. 112 call takers are an essential part of this procedure and all actions taken by both the European Union as a constitutional body as well as the Member States as individual part of this indeed important procedure, must take into serious consideration the needs and wants of call takers in order to enable the best possible working environment. Such action shall be in full alignment with the contemporary management procedures that are widely accepted by all academics all around the world. Taking into consideration specific performance parameters such as:

i.   The physical Environment
ii.   Financial incentives
iii. Motivation   *Performance*
iv.   Continuous professional development   *Parameters*
v.   Appreciation of the job

These will lead to better performance by employees, hence, leading to better results for those in need. On the other hand, employees are called upon to take full responsibility of their job and focus on it in an efficient and effective attitude.

The 112 Emergency Line is vital for the overall safety of the citizens of European Union, as well as many more. This is a central theme for the development of a sound and comprehensive policy that will address all possible issues that are related within this framework and that have been examined within this research paper.

As for the academic and research value of the present Research Project, only further future research shall enable its validity and credibility. However, based on the current facts, it is strongly suggested that the findings are adequate to outline the current situation over the under examination subject.