IN THIS JOUNRAL

Great Britain Journals Press

journalspress.com

London Journal of Medical & Health Research

Volume 23 | Issue 11 | Compilation 1.0

COMPILED IN UNITED KINGDOM

ENGLISH

LONDON JOURNAL OF MEDICAL AND HEALTH RESEARCH

Volume 23 | Issue 11 | Compilation 1.0

PUBLISHER

Great Britain Journals Press
1210th, Waterside Dr, Opposite Arlington Building, Theale, Reading
Phone:+444 0118 965 4033 Pin: RG7-4TY United Kingdom

SUBSCRIPTION

Frequency: Quarterly

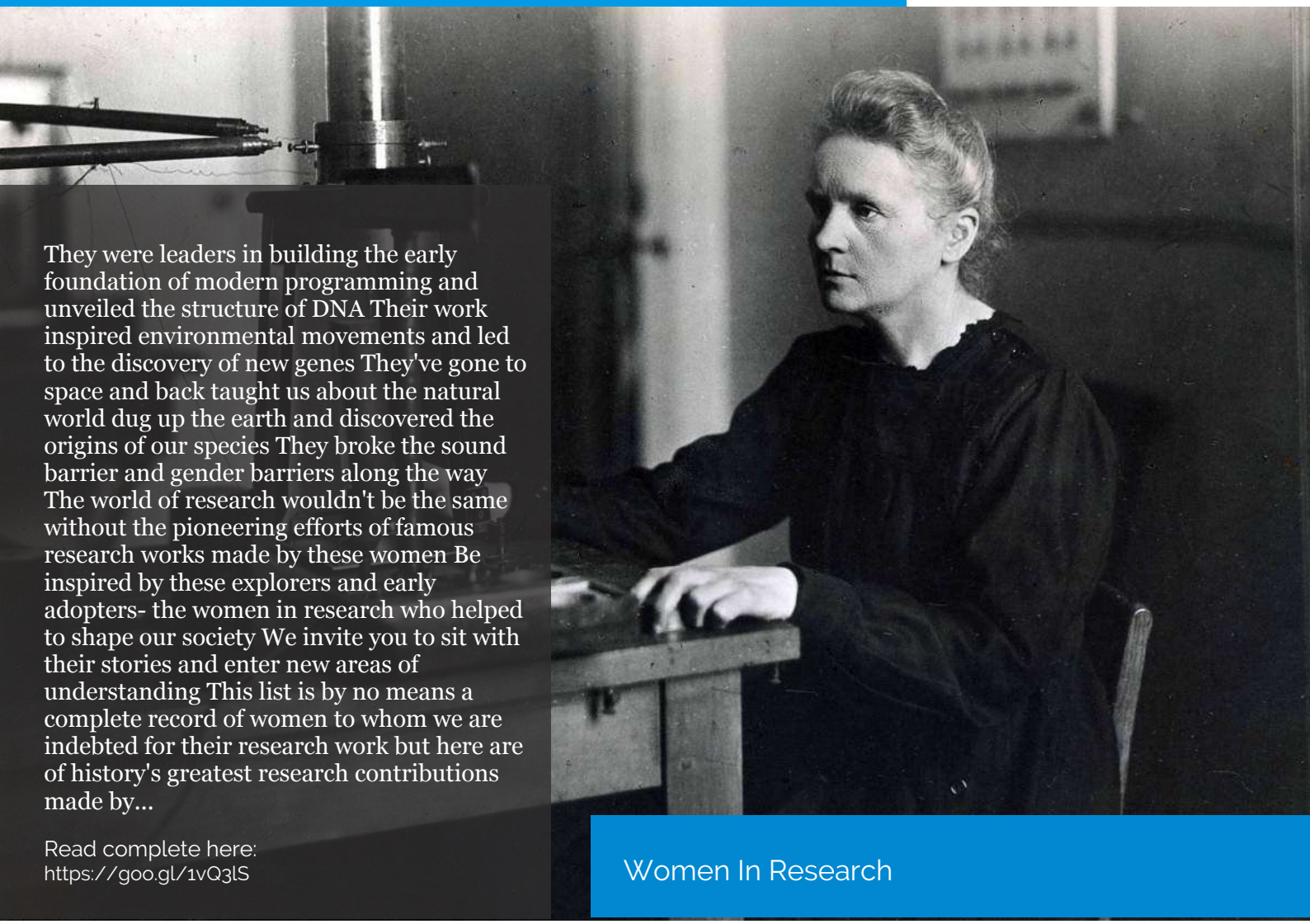
Print subscription
$280USD for 1 year
$500USD for 2 year
(*color copies including taxes and international shipping with TSA approved)*
Find more details at https://journalspress.com/journals/subscription

ENVIRONMENT

Great Britain Journals Press is intended about Protecting the environment. This journal is printed using led free environmental friendly ink and acid–free papers that are 100% recyclable.

Great Britain Journals Press Headquaters

1210th, Waterside Dr,
Opposite Arlington
Building, Theale, Reading
Phone:+444 0118 965 4033
Pin: RG7-4TY
United Kingdom



They were leaders in building the early foundation of modern programming and unveiled the structure of DNA Their work inspired environmental movements and led to the discovery of new genes They've gone to space and back taught us about the natural world dug up the earth and discovered the origins of our species They broke the sound barrier and gender barriers along the way The world of research wouldn't be the same without the pioneering efforts of famous research works made by these women Be inspired by these explorers and early adopters- the women in research who helped to shape our society We invite you to sit with their stories and enter new areas of understanding This list is by no means a complete record of women to whom we are indebted for their research work but here are of history's greatest research contributions made by...

Read complete here:
https://goo.gl/1vQ3lS

Women In Research

E-learning and the future of...

Education is one of the most important factors of poverty alleviation and economic growth in the...

Read complete here:
https://goo.gl/SQu3Yj

Writing great research...

Prepare yourself before you start Before you start writing your paper or you start reading other...

Read complete here:
https://goo.gl/np73jP

Journal Content
In this Issue

Great Britain Journals Press

Editorial Board

Curated board members

Dr. Izzet Yavuz

MSc, Ph.D., D Ped Dent.
Associate Professor, Pediatric Dentistry Faculty of Dentistry, University of Dicle Diyarbakir, Turkey

Dr. Sanjay Dixit, M.D.

Director, EP Laboratories, Philadelphia VA Medical Center Cardiovascular Medicine – Cardiac Arrhythmia Univ of Penn School of Medicine Web: pennmedicine.org / wagform / MainPage.aspx?

Sanguansak Rerksuppaphol

Department of Pediatrics Faculty of Medicine Srinakharinwirot University Nakorn Nayok, Thailand

Antonio Simone Laganà

M.D. Unit of Gynecology and Obstetrics Department of Human Pathology in Adulthood and Childhood "G.Barresi" University of Messina, Italy

Dr. Han-Xiang Deng

MD., Ph.D
Associate Professor and Research Department Division of Neuromuscular Medicine Davee Department of Neurology and Clinical Neurosciences Northwestern University Feinberg School of Medicine Web: neurology. northwestern. edu / faculty / deng.html

Dr. Pina C. Sanelli

Associate Professor of Radiology Associate Professor of Public Health Weill Cornell Medical College Associate Attending Radiologist NewYork - Presbyterian Hospital MRI, MRA, CT, and CTA Neuroradiology and Diagnostic Radiology M.D., State University of New York at Buffalo, School of Medicine and Biomedical Sciences Web: weillcornell.org / pinasanelli /

Dr. Roberto Sanchez

Associate Professor
Department of Structural and Chemical Biology Mount Sinai School of Medicine Ph.D., The Rockefeller University Web: mountsinai.org /

Dr. Michael R. Rudnick

M.D., FACP
Associate Professor of Medicine Chief, Renal Electrolyte and Hypertension Division (PMC) Penn Medicine, University of Pennsylvania Presbyterian Medical Center, Philadelphia Nephrology and Internal Medicine Certified by the American Board of Internal Medicine Web: uphs.upenn.edu /

Dr. Feng Feng

Boston University Microbiology
72 East Concord Street R702 Duke
University United States of America

Dr. Seung-Yup Ku

M.D., Ph.D., Seoul National University
Medical College, Seoul, Korea Department
of Obstetrics and Gynecology Seoul
National University Hospital, Seoul, Korea

Dr. Hrushikesh Aphale

MDS-Orthodontics and Dentofacial
Orthopedics. Fellow-World Federation
of Orthodontist, USA.

Santhosh Kumar

Reader, Department of Periodontology,
Manipal University, Manipal

Gaurav Singhal

Master of Tropical Veterinary Sciences,
currently pursuing Ph.D in Medicine

Dr. Aarti Garg

Bachelor of Dental Surgery (B.D.S.)
M.D.S. in Pedodontics and Preventive
Dentistr Pursuing Phd in Dentistry

Sabreena Safuan

Ph.D (Pathology) MSc (Molecular Pathology
and Toxicology) BSc (Biomedicine)

Arundhati Biswas

MBBS, MS (General Surgery), FCPS,
MCh, DNB (Neurosurgery)

Getahun Asebe

Veterinary medicine, Infectious diseases,
Veterinary Public health, Animal Science

Rui Pedro Pereira de Almeida

Ph.D Student in Health Sciences
program, MSc in Quality Management
in Healthcare Facilities

Dr. Suraj Agarwal

Bachelor of dental Surgery Master of Dental Surgery in Oromaxillofacial Radiology. Diploma in Forensic Science & Oodntology

Dr. Sunanda Sharma

B.V.Sc. & AH, M.V.Sc (Animal Reproduction, Obstetrics & gynaecology), Ph.D. (Animal Reproduction, Obstetrics & gynaecology)

Osama Alali

PhD in Orthodontics, Department of Orthodontics, School of Dentistry, University of Damascus. Damascus, Syria. 2013 Masters Degree in Orthodontics.

Shahanawaz SD

Master of Physiotherapy in Neurology
PhD-Pursuing in Neuro Physiotherapy
Master of Physiotherapy in Hospital Management

Prabudh Goel

MCh (Pediatric Surgery, Gold Medalist), FISPU, FICS-IS

Dr. Shabana Naz Shah

PhD. in Pharmaceutical Chemistry

Raouf Hajji

MD, Specialty Assistant Professor in Internal Medicine

Vaishnavi V.K Vedam

Master of dental surgery oral pathology

Surekha Damineni

Ph.D with Post Doctoral in Cancer Genetics

Tariq Aziz

PhD Biotechnology in Progress

Research papers and articles

Volume 23 | Issue 11 | Compilation 1.0

Radiation Dose Tracking in Digital Mammography: Evaluation of Population Profiles through Automatic Data Extraction from the DICOM Header

Homero Schiabel, Eny Moreira Ruberti Filha, Oswaldo Jorge Neto & Luciana Buffa Verçosa

University of S. Paulo

ABSTRACT

International regulatory organizations for quality control of X-ray systems, such as the International Atomic Energy Agency (IAEA), have implemented protocols for acceptance testing of digital mammography and breast tomosynthesis equipment, aiming to establish quality standards in radiology services. However, these guidelines are usually based on tests with breast phantoms with standardized thicknesses and compositions, often not representative of the patient population profiles at those services. In a prior study, we developed a computational system designed to automatically tracking and managing data extracted from the image acquisition processes of digital mammography and breast tomosynthesis, stored on a DICOM SCP (Service Class Provider) server.

Keywords: DICOM, digital mammography, radiation dose, quality assurance in mammography.

Classification: NLMC Code: WN 200-234

Language: English

Great Britain Journals Press

LJP Copyright ID: 392821

London Journal of Medical and Health Research

Volume 23 | Issue 11 | Compilation 1.0

Radiation Dose Tracking in Digital Mammography: Evaluation of Population Profiles through Automatic Data Extraction from the DICOM Header

Homero Schiabel[α], Eny Moreira Ruberti Filha[σ], Oswaldo Jorge Neto[ↀ] & Luciana Buffa Verçosa[¥]

ABSTRACT

International regulatory organizations for quality control of X-ray systems, such as the International Atomic Energy Agency (IAEA), have implemented protocols for acceptance testing of digital mammography and breast tomosynthesis equipment, aiming to establish quality standards in radiology services. However, these guidelines are usually based on tests with breast phantoms with standardized thicknesses and compositions, often not representative of the patient population profiles at those services. In a prior study, we developed a computational system designed to automatically tracking and managing data extracted from the image acquisition processes of digital mammography and breast tomosynthesis, stored on a DICOM SCP (Service Class Provider) server. This approach enables obtaining technical reports characterizing exposure parameters and tests have shown that the reference levels outlined in international standards for breast composition and radiation dose do not accurately reflect the characteristics of the actual patient population. Thus this study describes data collection and corresponding analysis for the dose tracking process primarily on three digital mammography systems of different radiological services. Extensive image datasets from these systems were obtained using a new application described previously, with a focus on dose profiles generated during exposures. Graphical representations resulting from the datasets are presented, along with analysis of skin entrance and mean glandular doses distributions, average kV and mAs applied during the exams together with the target/filter combinations, radiographic density distribution, as well as the age and breast thickness characteristic of the respective population submitted to exposures in each of those mammography services. Additionally, the extent of information and ease of acquisition provided by the tool for performance evaluation of digital mammography services is discussed.

Keywords: DICOM, digital mammography, radiation dose, quality assurance in mammography.

Author α: Dept of Electrical and Computer Engineering, EESC, University of S. Paulo, S. Carlos, SP.
σ: Ruberti & Ruberti Consulting on Radiological Protection and Quality Control Ltd, S. Paulo, SP.
ↀ ¥: University hospital of Federal University of S. Carlos, SP.

I. INTRODUCTION

Breast cancer, according to World Health Organization [1], accounts for an estimated 2.3 million new cases, as reported in 2020. The same estimation indicates probably about 15.5 million cases in 2030. The highest mortality rate due to breast cancer in Brazil, for instance, is observed in the Southeast region, with 16.14 deaths per 100,000 women. This highlights the importance not only of self-examination but also of undergoing examinations such as mammography. Furthermore, it is crucial to adhere to quality and safety standards when conducting such examinations regarding the benefit of patients.

In order to ensure comprehensive breast imaging while optimizing the number of images and minimizing the radiation exposure to the patient, two main projections are employed in

London Journal of Medical & Health Research

mammography: mediolateral-oblique (MLO) and craniocaudal (CC) [2]. This approach also reduces the areas not exposed to the X-ray beam, which is captured on the imaging plane.

Optimal generation of the X-ray beam is crucially important, aligning with the chosen imaging acquisition method, meaning that photons should have energy within the optimal range. As the selection of the anode/filter material of the X-ray tube varies according to its performance for certain breast thicknesses and density, the material selection can be relevant to acquire the best image quality with the lowest radiation dose for the patient.

The application of diagnosis standards is decisive to ensure the quality of radiological services, as emphasized in the IEC 61223-1 standard [3]. This standard not only covers the quality aspects of mammography equipment but also covers operational techniques and acceptance tests. Furthermore, guidelines for digital mammography quality have been developed, taking into account test results, particularly those obtained using phantoms defined in national and international standards. These guidelines primarily focus on standard breast thicknesses and glandular composition, although it is well known that breast composition can vary among different populations [4-6].

Consequently, determining the characteristic features of each specific population is important in order to establish reference levels for radiation doses absorbed by breast tissue. In current digital mammography procedures, all images are recorded in accordance with the DICOM (Digital Imaging and Communication in Medicine) protocol [7], which includes essential information about the examination and exposure conditions, such as breast thickness and the dose received by the breast during the procedure, among other information. Therefore, investigating this technical data from the DICOM header can contribute to enhancing the image acquisition process.

By properly using anode/filter combination, in addition to the electrical parameters of the equipment, the Skin Entrance Dose (SED) and the Mean Glandular Dose (MGD) can be minimized. These values can be measured and associated with patient images through the DICOM protocol.

Therefore, the development of a computational tool that uses data extracted from these files to provide information on dose profiles could effectively manage the image acquisition process. This tool, in conjunction with the characterization of the population profile, could complement the standard quality assurance tests in digital mammography. By following the quality criteria required by medical professionals and international standards, this approach aims to improve the overall quality of digital mammography examinations.

Our team previously conducted a study [8] aiming to extract relevant data from DICOM headers of a collection of 2D digital mammography and digital breast tomosynthesis images. Modifications to this previous approach, developed in JAVA language, resulted in software tested using a database consisting of mammography cases from patients exposed to a FFDM (Full Field Digital Mammography) equipment at a public hospital in Brazil [9]. In such a study [9], the responses of the DICOM header from a set of images were evaluated and compared with quality control tests conducted in practice. The purpose was to estimate the actual mean glandular dose (MGD) using a calibrated dosimeter (Accu-Gold AGMS-M +, Radcal, Monrovia, CA) based on the values of kerma measured with PMMA and those calculated for the breast tissue in a digital mammography system. The calculation of MGD was based on Dance´s method [10], which involved the product of some parameters such as air kerma, standard density, standard thickness, half-value layer (HVL), and the target-filter combination.

Once validated the effectiveness of our software (named *ReadDICOM*) through that investigation [9], the current study focuses on the evaluation of many correlations possible to extract from the data contained in DICOM headers regarding the mammography images from the exams performed in FFDM equipment. Here not only aspects of patient doses based on breast thickness or age are

considered, but also the parameters of the X-ray equipment used as well as aspects on radiographic density. The purpose is to provide a comprehensive temporal analysis of examination procedures in a mammography service, focusing on dosimetry aspects and their relationship with the population characteristics of the patients undergoing these examinations.

II. METHODS AND MATERIALS

The images used for analysis were obtained at 3 radiological facilities installed in public hospitals in the state of Sao Paulo, Brazil. All of those radiological services used GE FFDM (*Senographe DS* or *Senographe Essential*) mammography equipment at the time the examinations corresponding to the present study were conducted. From the "Radiological Unit 1", our database stored information from mammography examinations of 380 patients (exams between November and December, 2013); from the "Unit 2", in turn, data was collected from examinations of 63 patients (exams between October, 2013 and February, 2015), while from "Unit 3" the total recorded data referred to examinations conducted on 1,025 patients (in this last case, about 5,000 exposures – images). However, this last dataset was divided into smaller sets to facilitate the analysis. Therefore, for this current description, a set of 1,367 images, representing exams of almost 300 patients (performed between June 2016 and June 2019) was taken into account for the main statistics.

One of the essential tools for conducting the study was the *ReadDICOM* software [9], developed in JavaScript, which is responsible for extracting the DICOM header data from each image file and organizing this information into a spreadsheet file. The user-friendly interface of the program allowed for easy extraction of all the necessary information for subsequent analyses in less than one minute for each images set. Once the data spreadsheet was complete, data pre-processing was performed. Initially, patients with a high number of missing data were excluded from the study as they were deemed irrelevant. Additionally, the acquisition date attribute and patient age were standardized.

After completing the data pre-processing, the following study profiles were defined for correlation analysis, similar to [8]: (a) patient identification, mammography machine, and examination date; (b) type of breast projection; (c) Voltage and, current-time parameter, and anode/filter materials; (d) breast thickness and compression force; (d) Skin Entrance Dose (SED) and Mean Glandular Dose (MGD) values.

In the population profile, we evaluated general patients aspects for the purpose of establishing correlations with the mammographic exam. The graphical analyses conducted are detailed below:

1. Distribution of cases based on patients breasts thickness;
2. Distribution of patients based on their ages;
3. Distribution of average breast thickness among patients according to their identified age;
4. Distribution of cases by thickness – separated by images projection: CC and MLO;
5. Histogram illustrating the distribution of cases divided into breast thickness ranges.

These analyses allowed for mapping the most relevant characteristics of the population served by those radiological services. For the dosimetry profile, which constitutes the primary focus of this study, the objective was to conduct quantitative and qualitative evaluations of the radiation doses received by the patients. The following relations were generated:

1. Histogram of Skin Entrance Dose (SED) values based on breast thickness ranges – by projection (CC and MLO) and overall;
2. Histogram of Mean Glandular Dose (MGD) values based on breast thickness ranges – by projection (CC and MLO) and overall;
3. Histogram illustrating the distribution of MGD in terms of the total number of exposures based on dose value ranges;
4. Average SED based on patient ages within the dataset;
5. Average MGD based on patient ages within the dataset;
6. Average SED and MGD received by patients;

7. Percentage of cases above the mean and standard deviation of SED and MGD per breast thickness range;
8. Histogram of the number of images taken for each target/filter combination;
9. Distribution of the number of patients per average breast thickness range, considering all images taken in a single examination.

These correlations provided fundamental insights into the behavior of the mammography equipment and its determination of radiation doses in each exposure.

Lastly, for the creation of the operational profile, operational parameter data (kVp and mAs) recorded during the mammographic exposures, in conjunction with the used target/filter combinations, were considered. The following graphical correlations were generated:

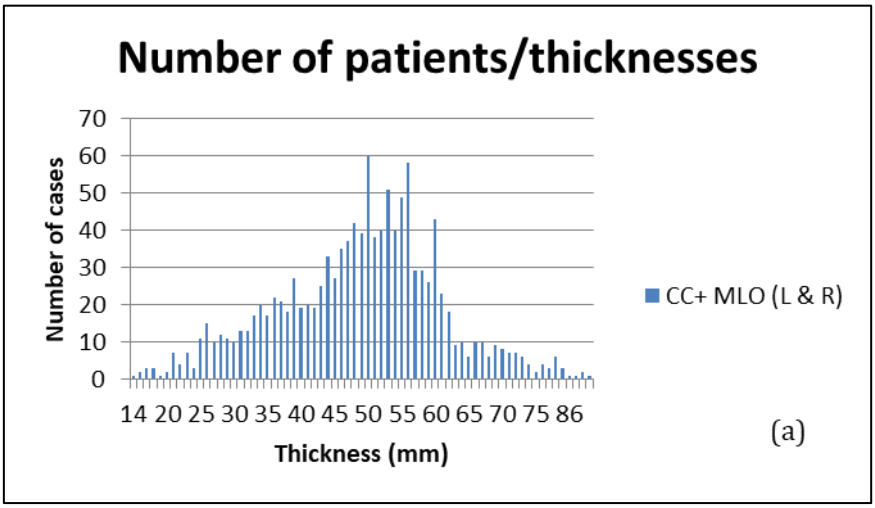
1. Average kVp and mAs values per breast thickness range during the examinations for the respective tube target/filter combinations: (a) Rh/Rh; (b) Mo/Rh; (c) Mo/Mo;
2. Average kVp and mAs values for all target/filter combinations;
3. Percentage of cases for the used target/filter combinations.

These correlations provided insights into the operational aspects of the mammography equipment, including the selection of target/filter combinations and the associated parameter values.

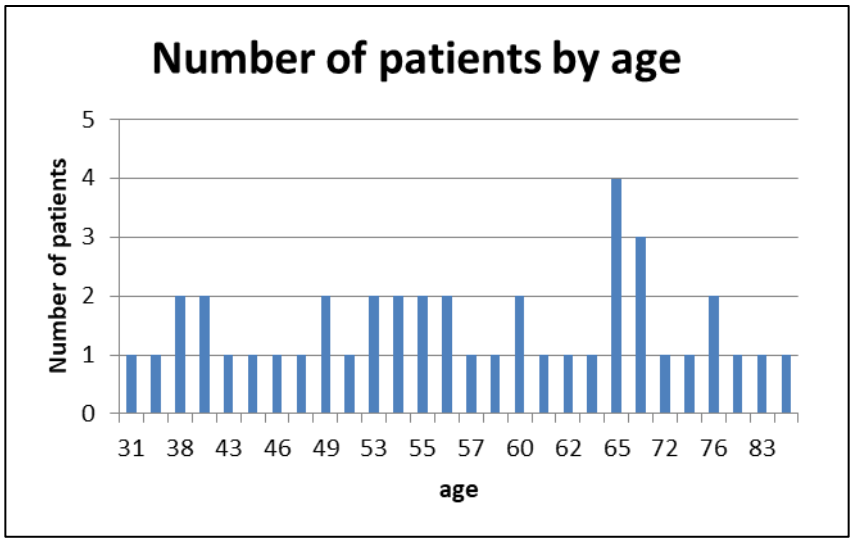
Furthermore, data were determined on the sizes of breast areas relative to all the images as well as their radiographic density. This was provided by using the latest version of the LIBRA software (Breast Imaging Group, UPenn) [11] on all image sets obtained from the 3 digital mammography units. As a result, this approach allowed determining an outcome corresponding to the profile of each set in terms of density variation (within the BIRADS ranges).

III. RESULTS

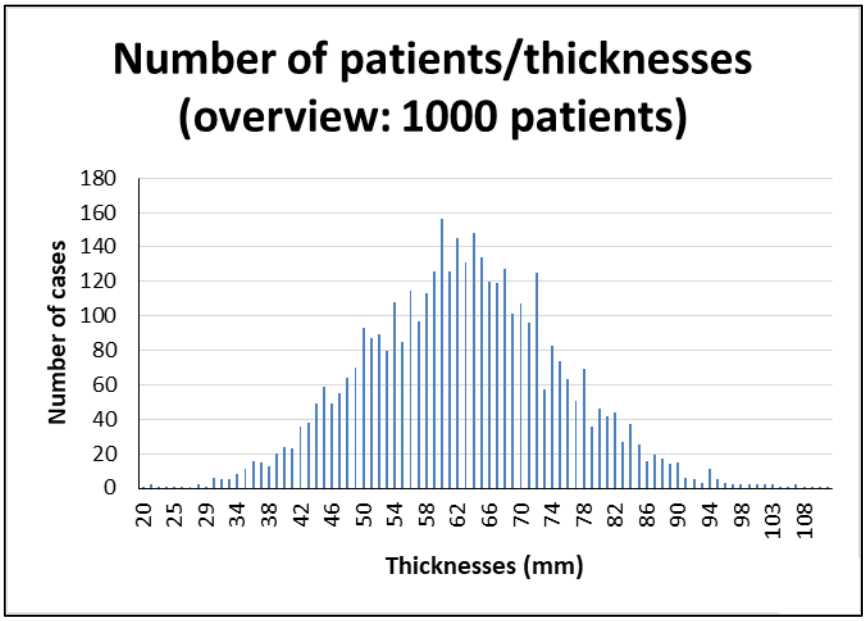
From the analysis of the image sets described in the previous section, we have determined initially the population profile of patients undergoing examinations on those mammography units during the respective time periods considered in the beginning of section 2. The results are graphically illustrated in Fig. 1, 2 and 3.



(a)

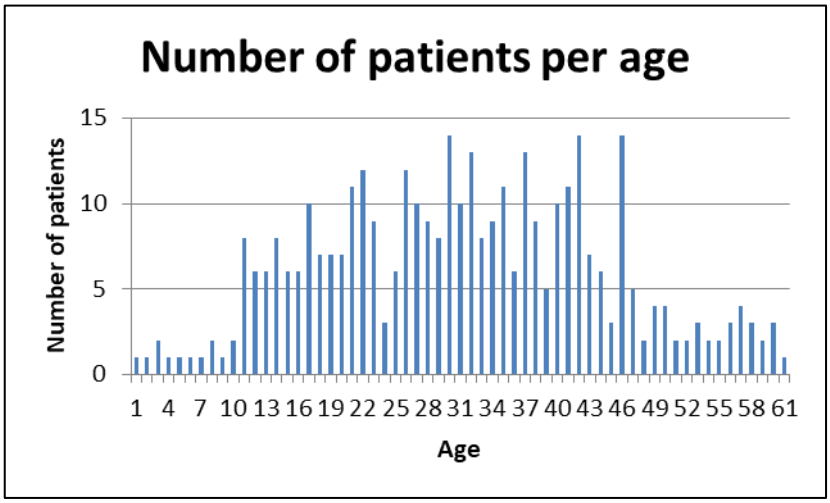


(b)

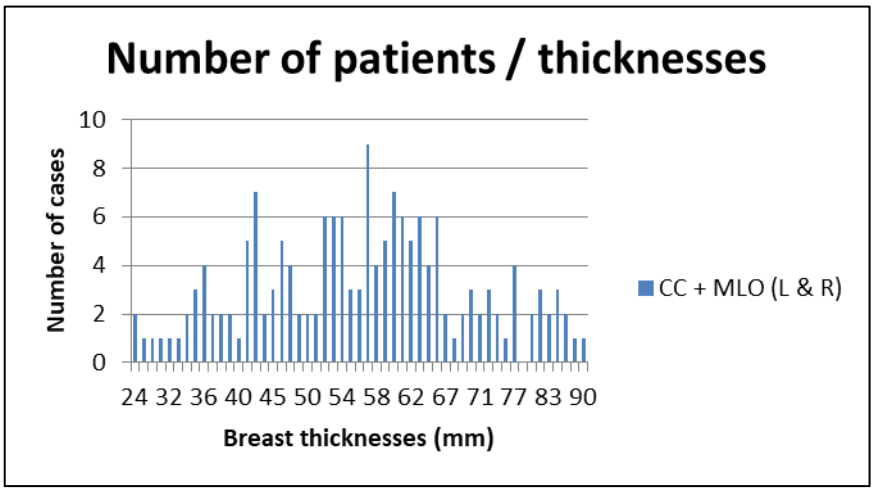


(c)

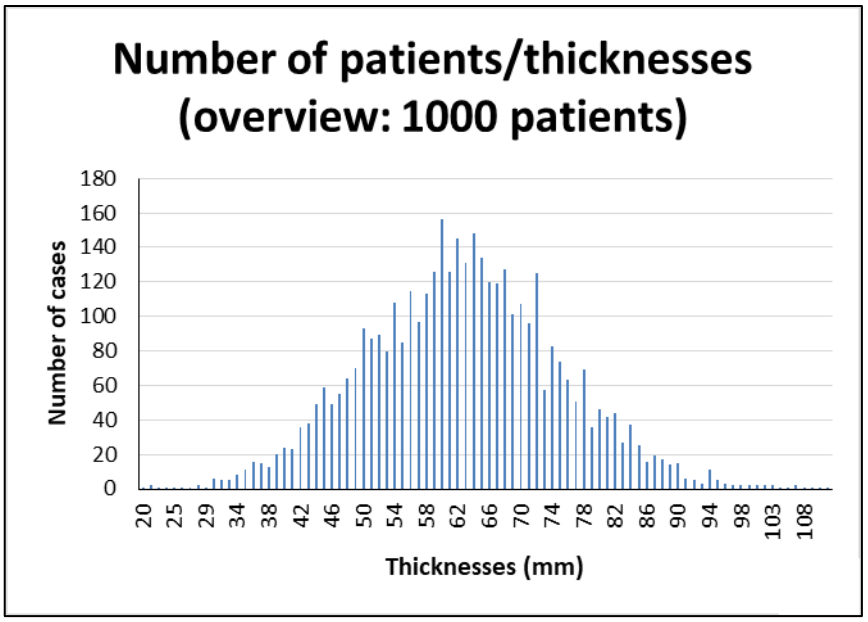
Fig. 1: Population Histogram I: Distribution of Cases According to Patients' Breast Thickness (a) for UNIT 1; (b) for UNIT 2 and (c) for UNIT 3



(a)

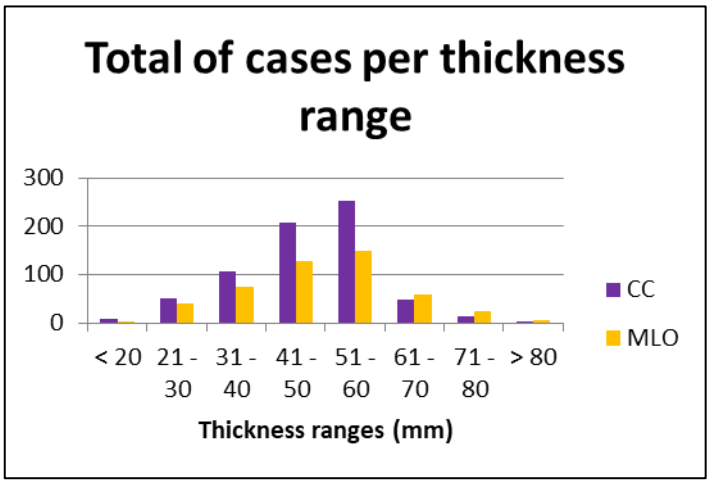


(b)

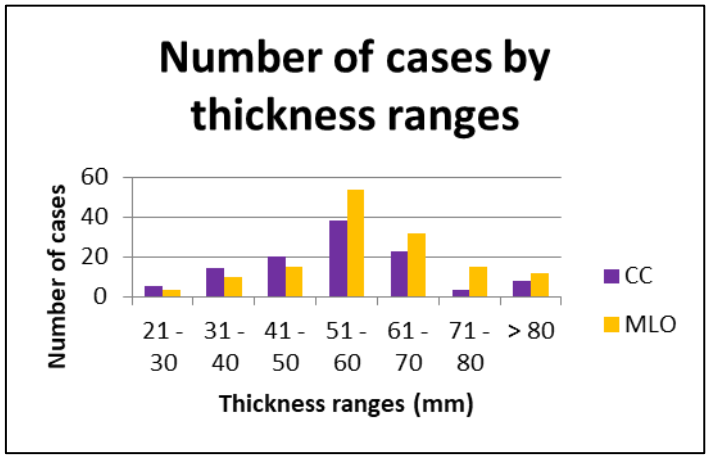


(c)

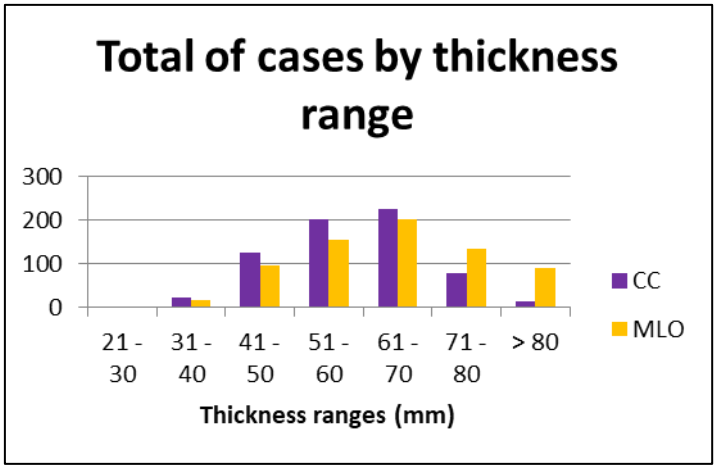
Fig. 2: Population Histogram II: Distribution of Cases According to Patient age (a) for UNIT 1; (b) for UNIT 2 and (c) for UNIT 3



(a)



(b)



(c)

Fig. 3: Histogram of Case Distribution by Thickness Separated by Breast Thickness Ranges. (a) for UNIT 1; (b) for UNIT 2 and (c) for UNIT 3

Organizations such as EUREF (European Reference Organization for Quality Assured Breast Screening and Diagnostic Services) use PMMA simulators with a thickness of 45mm [5], which is considered the average breast thickness in most quality control tests. The population profile data are thus relevant as they suggest the possibility of reformulating simulation objects to better match the reality of local/regional patients. They can also indicate the need for attention from professionals regarding the radiation dose faced by patients, as the compressed breast thickness is an essential factor in determining the dose the equipment should produce.

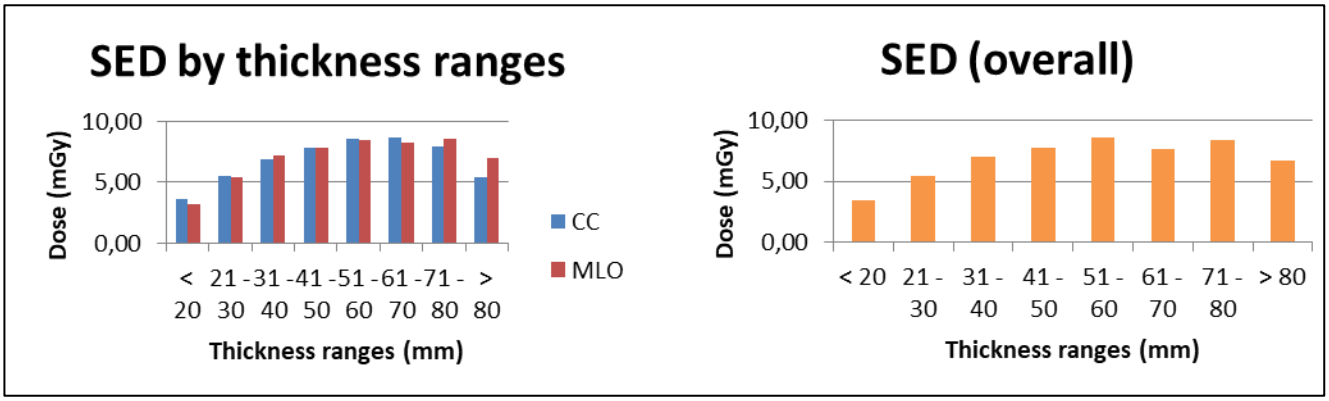
The evaluation of the population profiles from the graphs in Fig. 1 and 2 shows the following results for the average breast thickness and average age considered the three datasets:

- Unit 1: (a) average breast thickness: 48.8 (± 12.4) mm; (b) average age of patients in the dataset: 59.2 (± 13.1) years old;
- Unit 2: (a) average breast thickness: 55.9 (± 14.8) mm; (b) average age of patients in the dataset: 57.6 (± 13.2) years old;
- Unit 3: (a) average breast thickness: 62.6 (± 12.4) mm; (b) average age of patients in the dataset: 52.8 (± 12.8) years old.

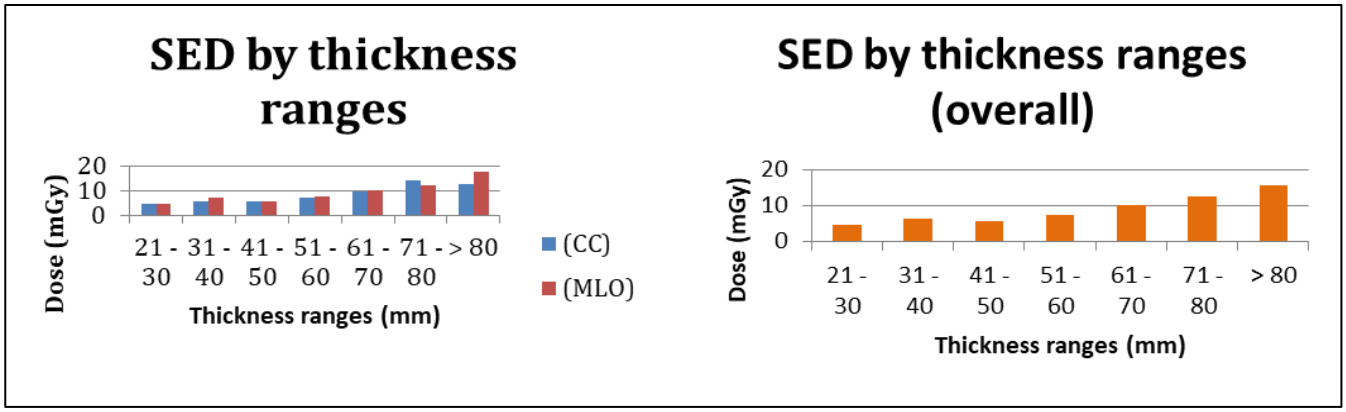
(NOTE: exceptionally, these results for Unit 3 were determined for the whole set of patients – slightly above 1,000 – undergoing examinations in such a mammography service during the 3 years period considered. The results for the next statistics, mainly relative to dose distributions and corresponding profiles, were determined to the smaller dataset initially described, comprising about one third of the total images set).

3.1 Determining the Profile of Exams Doses

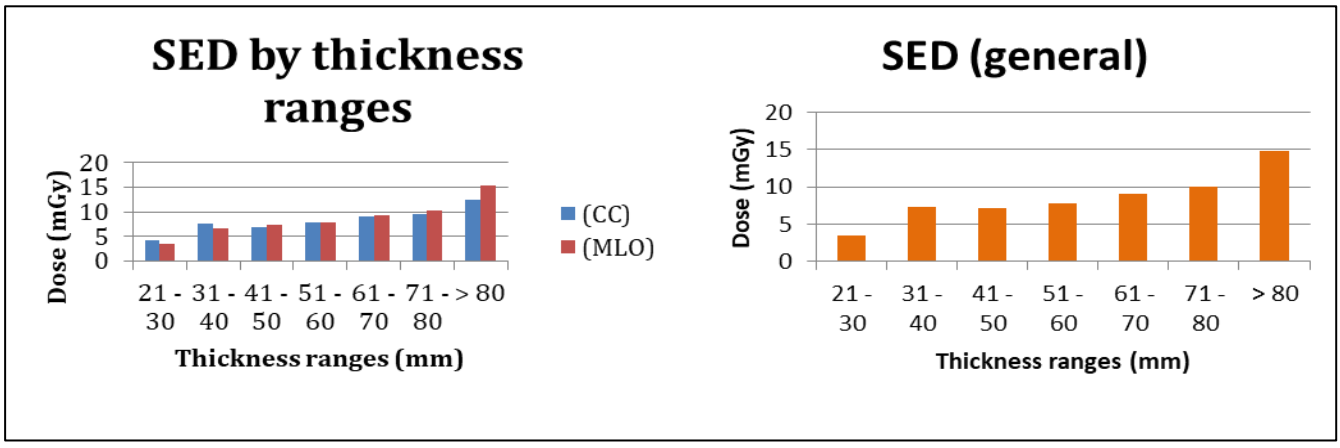
The main result from this evaluation includes study of the mammographic systems behavior regarding the doses applied in each exposure and examination. From the datasets for the 3 mammography services considered here these profiles are illustrated in Fig. 4 to 6.



(a)

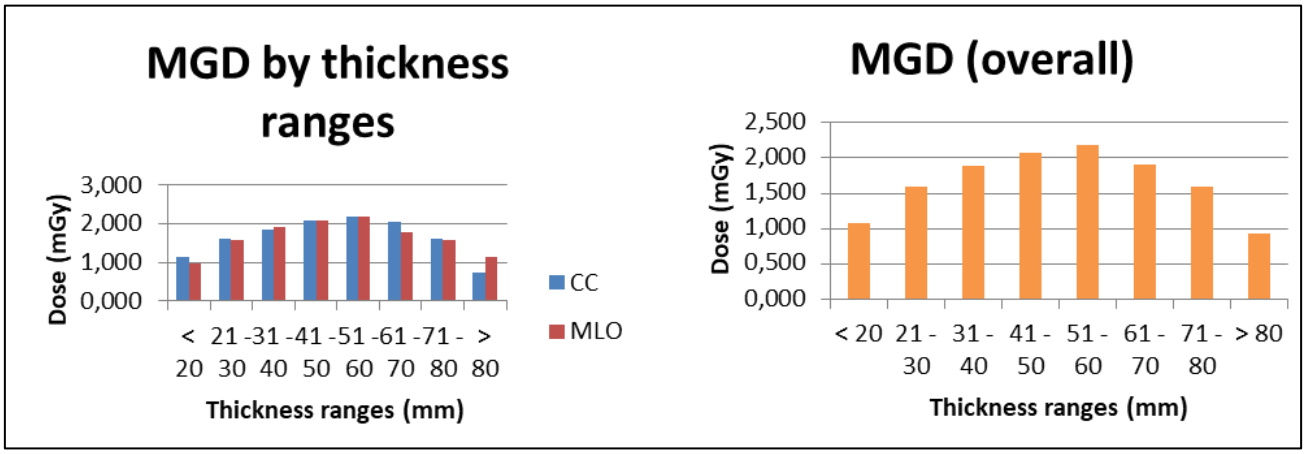


(b)

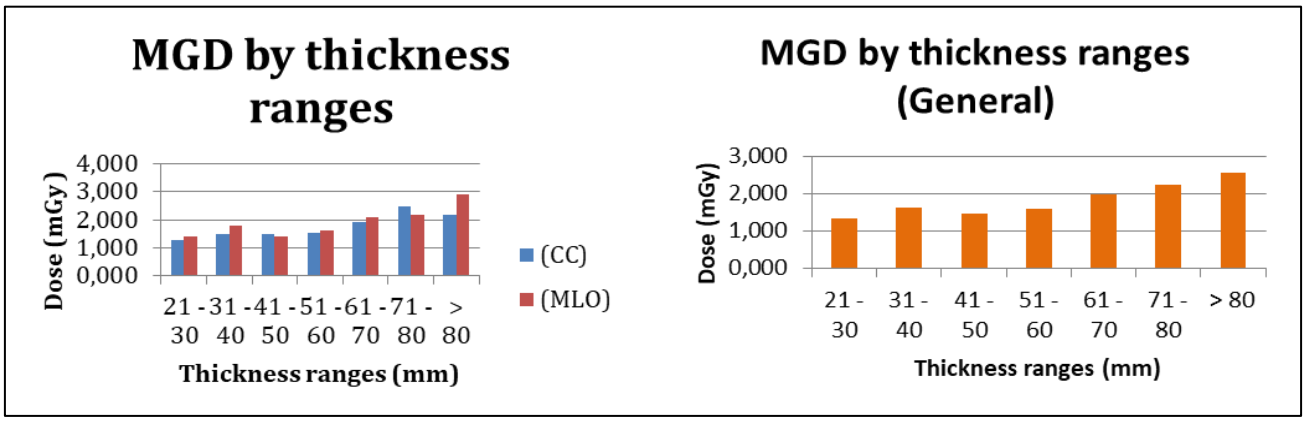


(c)

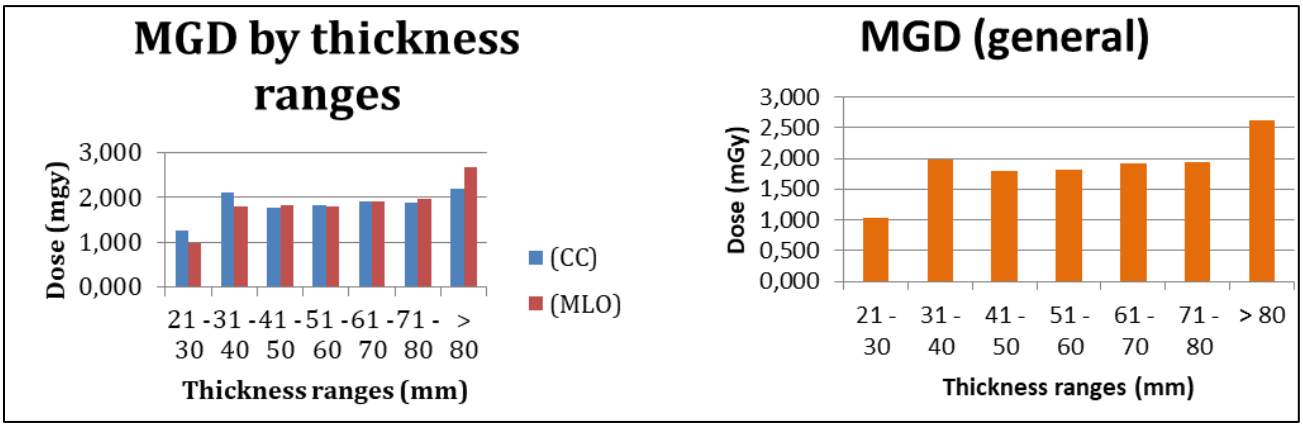
Fig. 4: Histogram of Skin Entrance Dose (SED) Values According to Breast Thickness Ranges, by Projection (CC and MLO) and overall: (a) for UNIT 1; (b) for UNIT 2; and (c) for UNIT 3



(a)

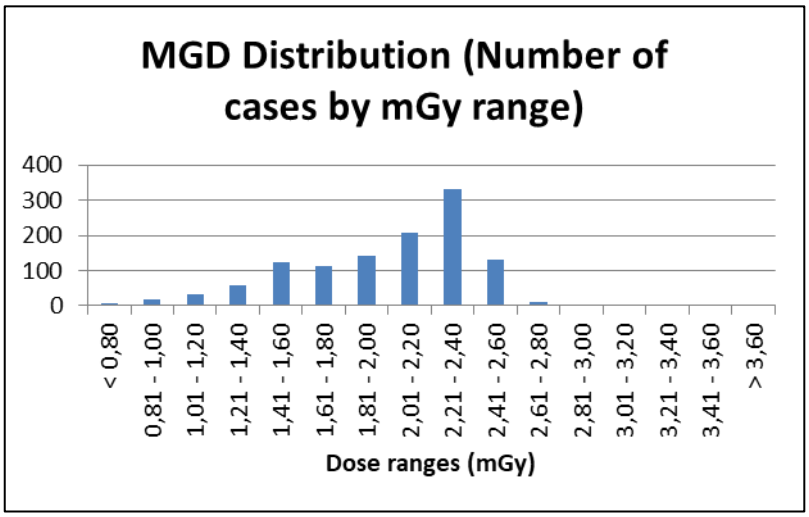


(b)

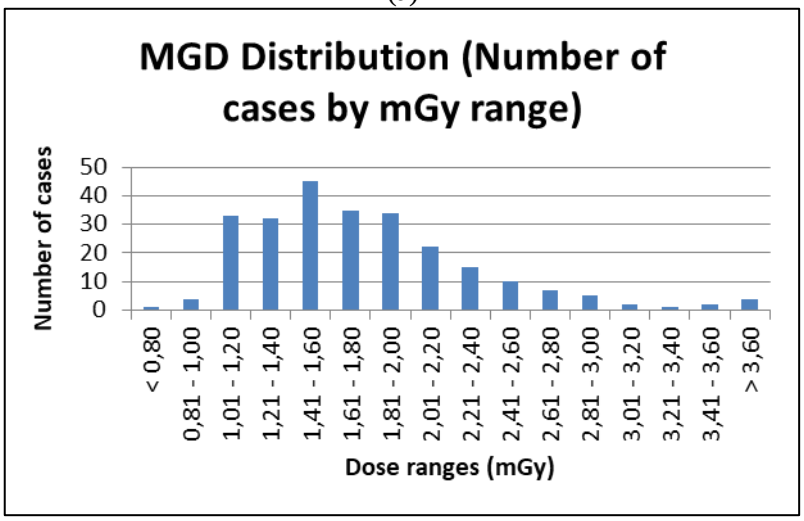


(c)

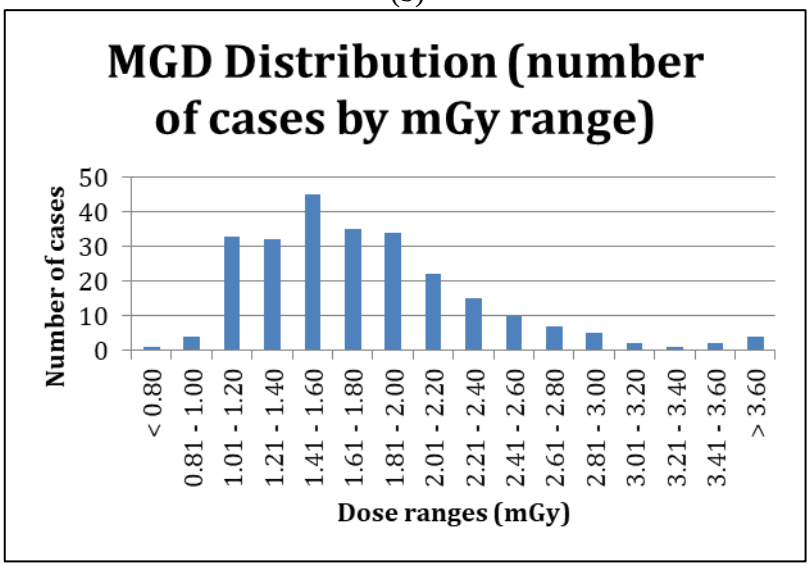
Fig. 5: Histogram of Mean Glandular Dose (MGD) Values According to breast Thickness Ranges by Projection (CC and MLO) and Overall: (a) for UNIT 1; (b) for UNIT 2 and (c) for UNIT 3



(a)



(b)



(c)

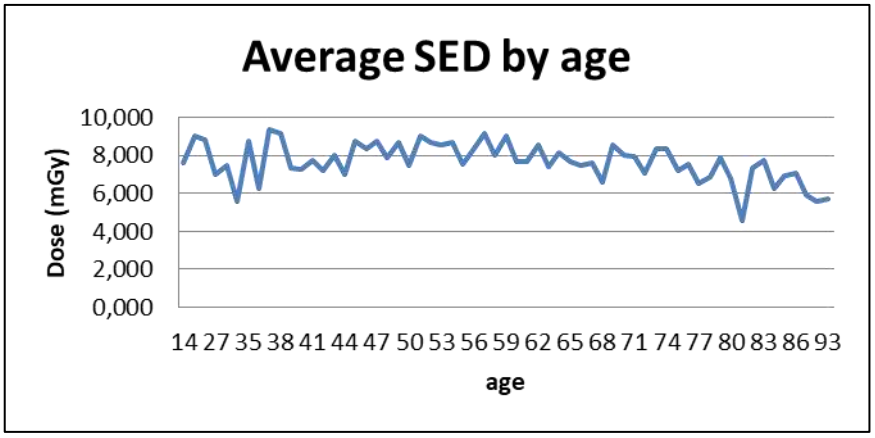
Fig. 6: Histogram of Mean Glandular Dose (MGD) Distribution in Terms of Total Exposures, according to dose Value Ranges. (a) for UNIT 1; (b) for UNIT 2 and (c) for UNIT 3

Also from the data obtained from all the DICOM headers for the three mammography systems under investigations here, we could determine the average SED and MGD for each set of patients as shown in Table 1:

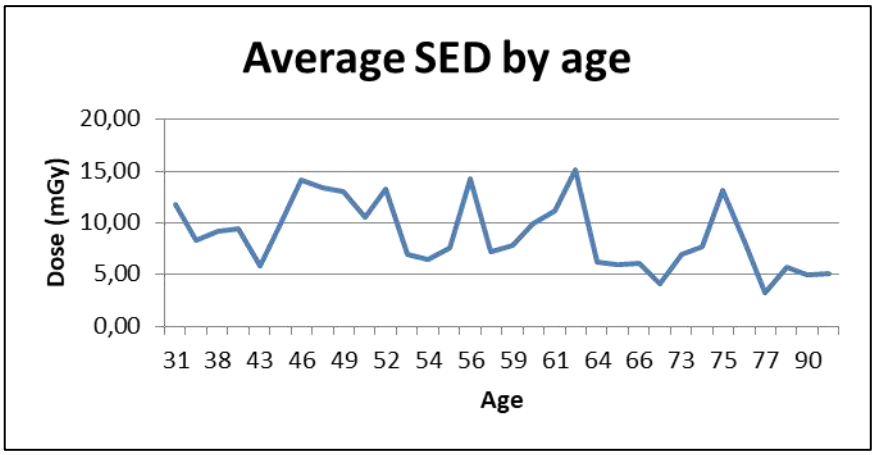
Table 1: Summary of the Average doses by Patient

Average Doses by Patient	UNIT 1	UNIT 2	UNIT 3
Average SED (mGy)	7.82 ± 1.4;	8.93 ± 3.5	8.90 ± 3.4
Average MGD (mGy)	2.01 ± 0.3	1.82 ± 0.3	1.92 ± 0.6
% of patients with SED greater than the average	57.1%	38.8%	42.6%
% of patients with SED greater than [average + standard deviation]	31.4%	24.2%	30.4%
	17.9% of the total of patients	9.0% of the total of patients	12.9% of the total of patients

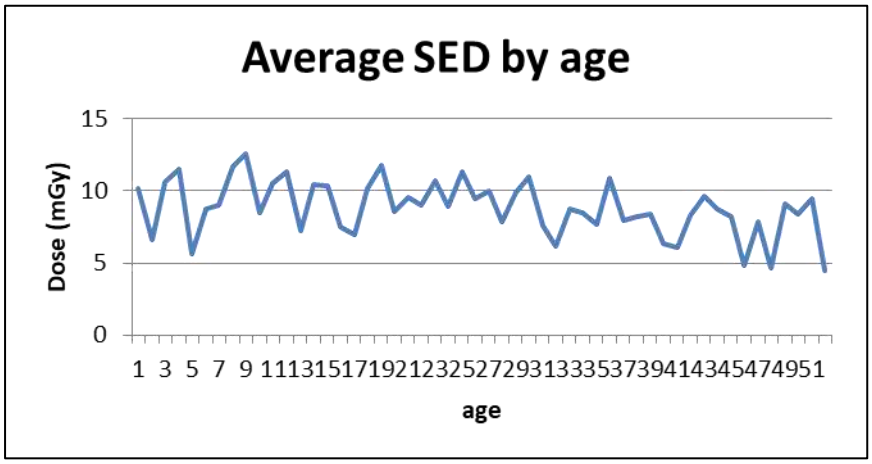
In addition, we determined the behavior of the average dose received by patients, now as a function of their age. The corresponding results are shown in Fig. 7 (SED) and 8 (MGD).



(a)

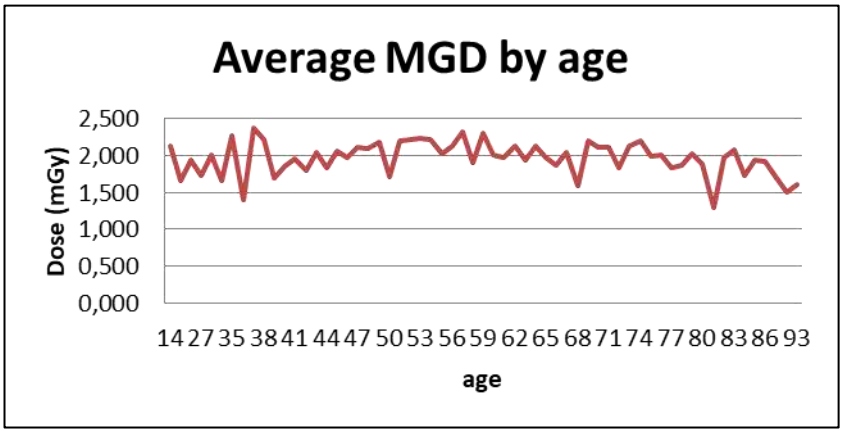


(b)

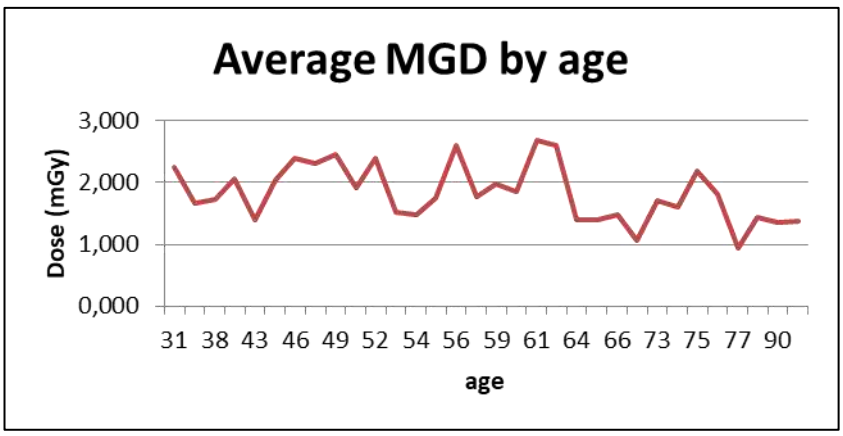


(c)

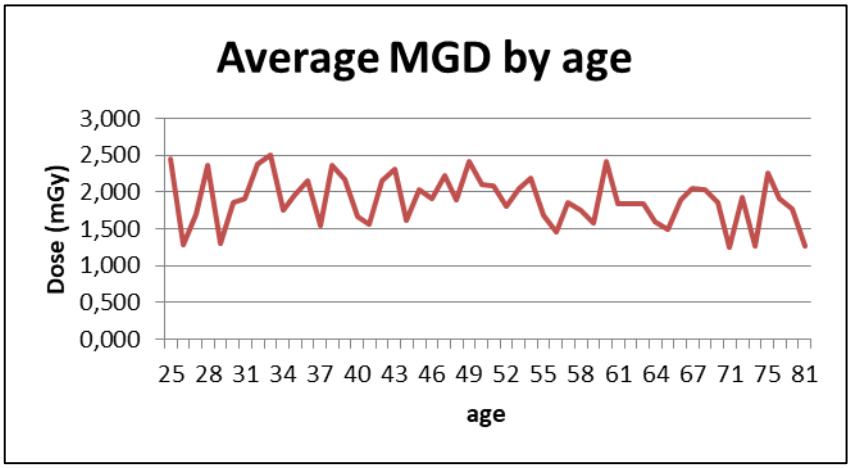
Fig. 7: Graphical behavior of SED as a Function of the Patients age for the Respective dataset: (a) for UNIT 1; (b) for UNIT 2 and (c) for UNIT 3



(a)



(b)

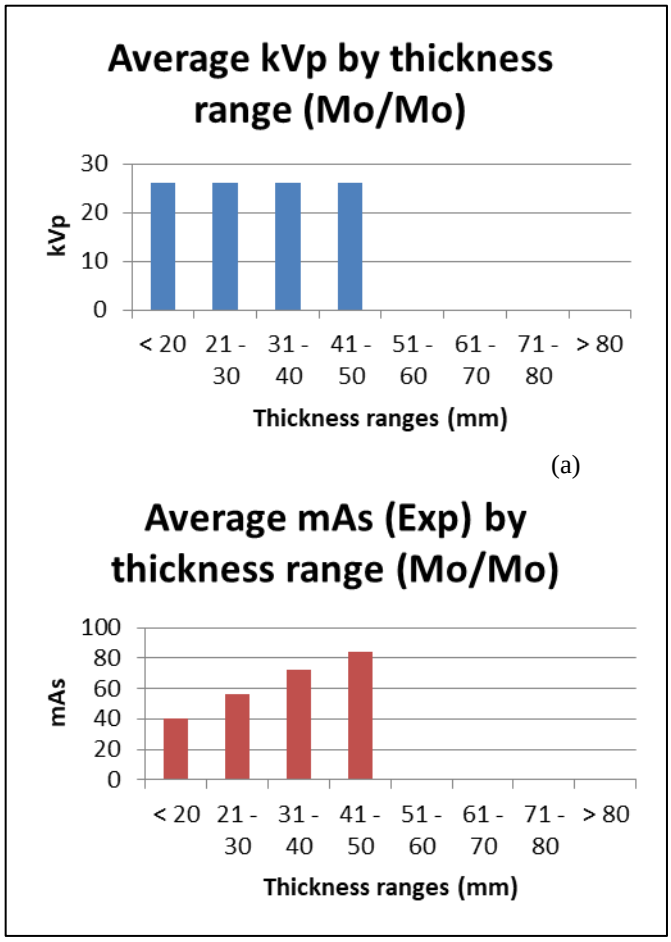


(c)

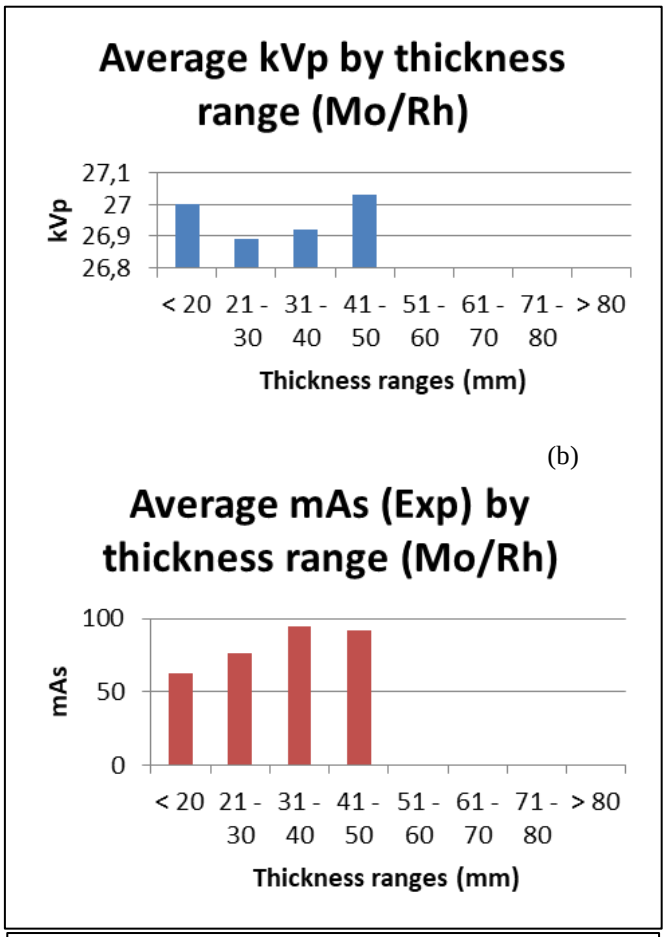
Fig. 8: Graphical behavior of MGD as a Function of the Patients age for the Respective Dataset: (a) for UNIT 1; (b) for UNIT 2 and (c) for UNIT 3

3.2 Determining the Mammography Systems Operating Parameters

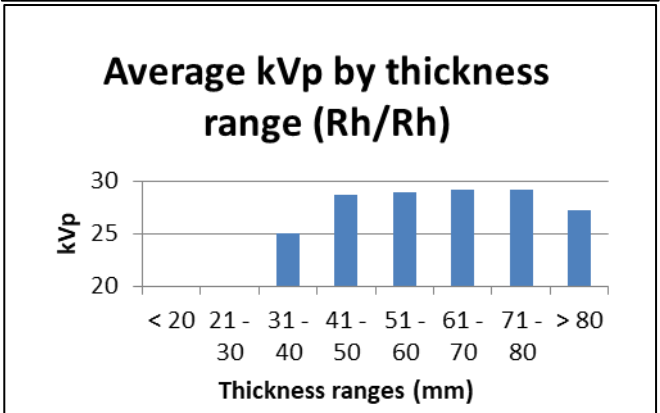
Among the data collected in the study, the operating parameters recorded by the equipment (kV and mAs) as well as the systems behavior in terms of target-filter combinations used during the exposures were also considered. The graphs obtained from this evaluation are illustrated in Fig. 9 and 10.



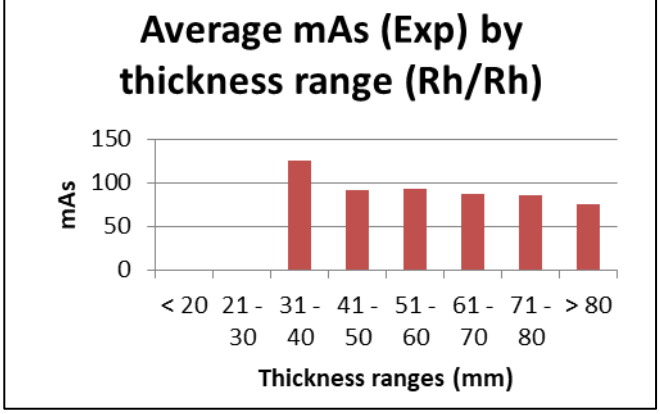
(a)

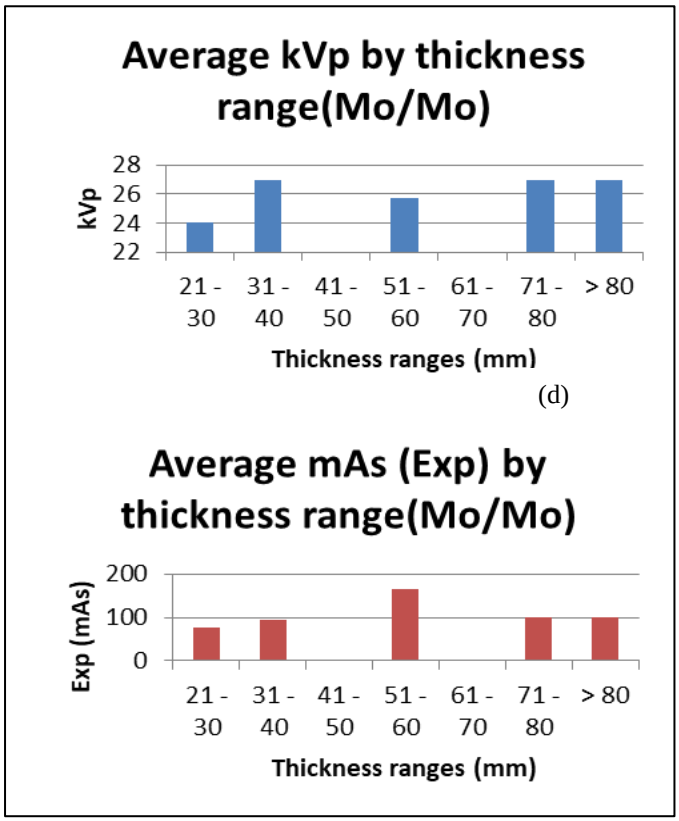


(b)

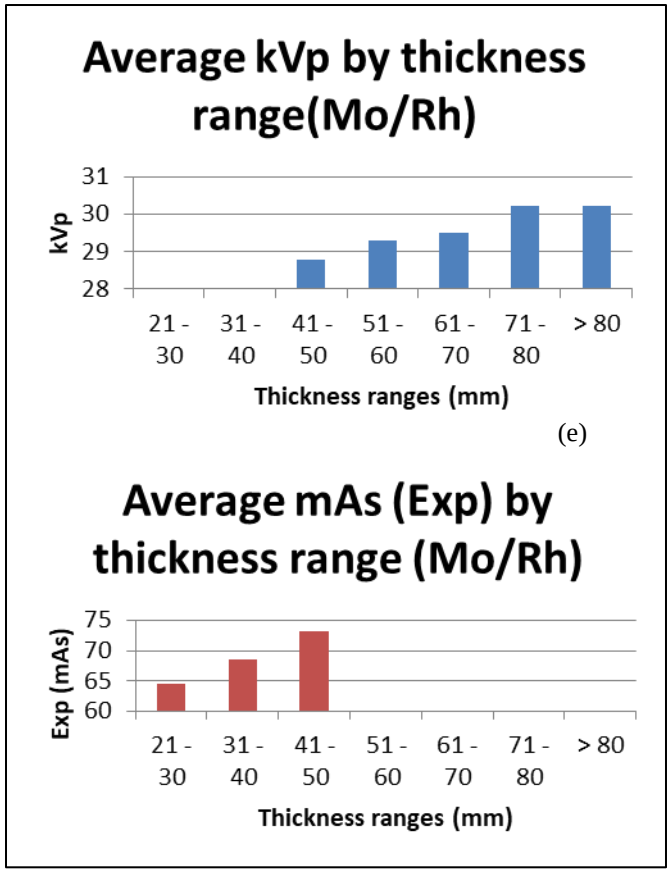


(c)

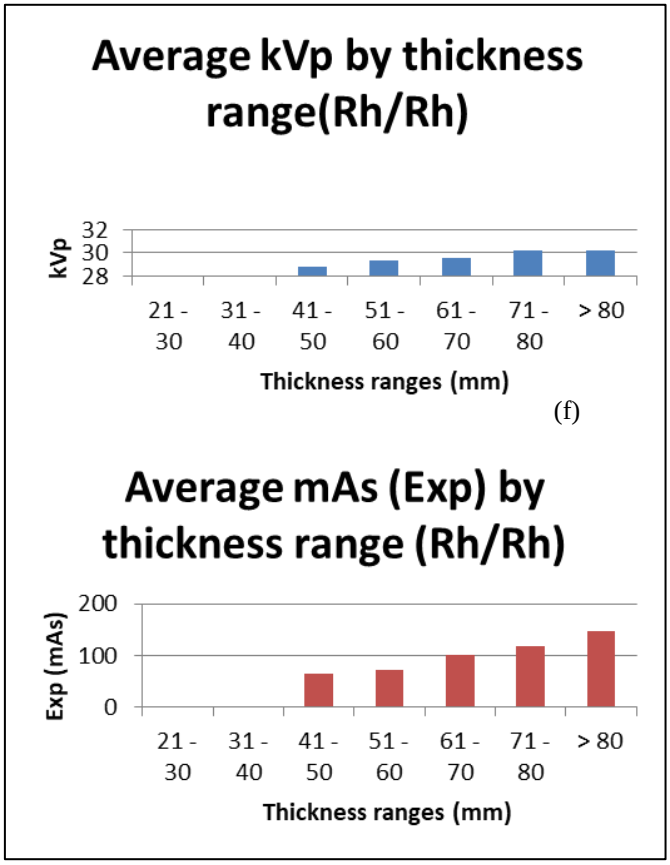




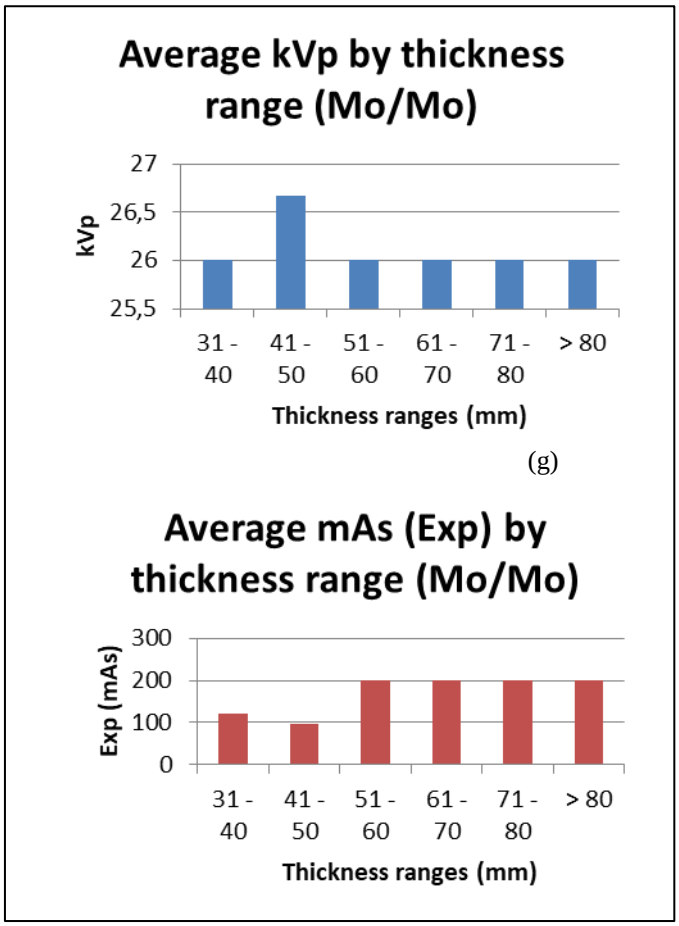
(d)



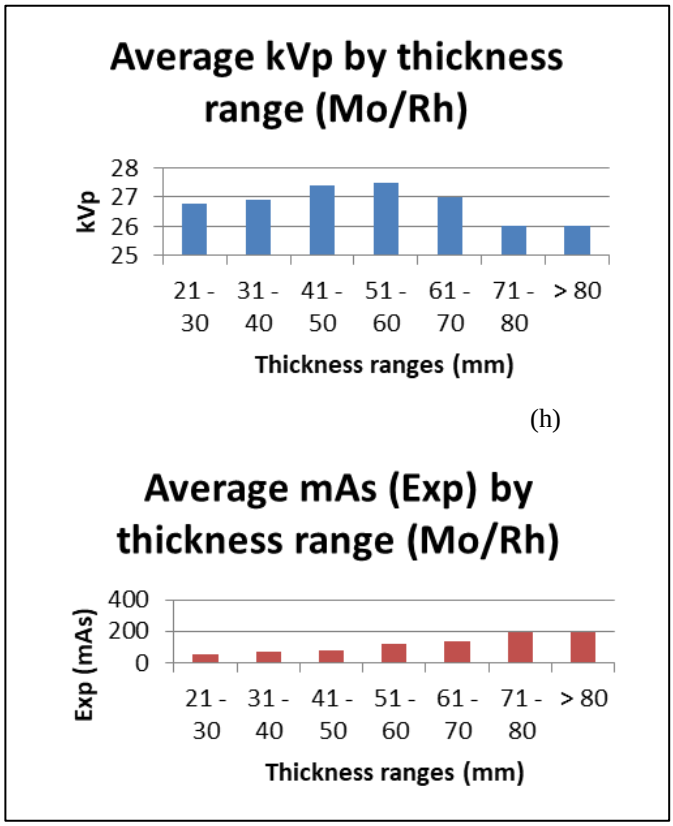
(e)



(f)



(g)



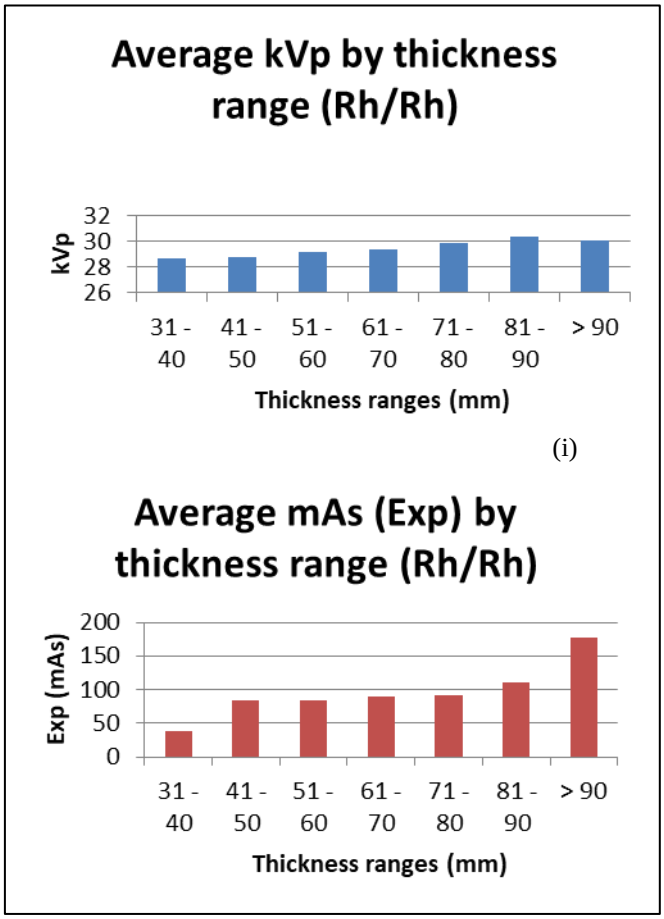
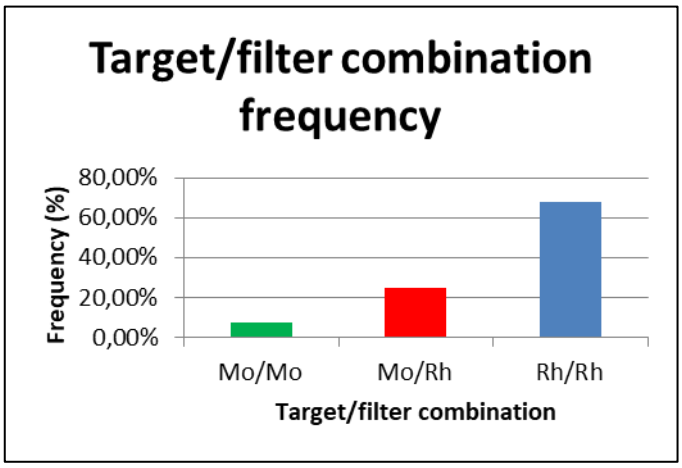
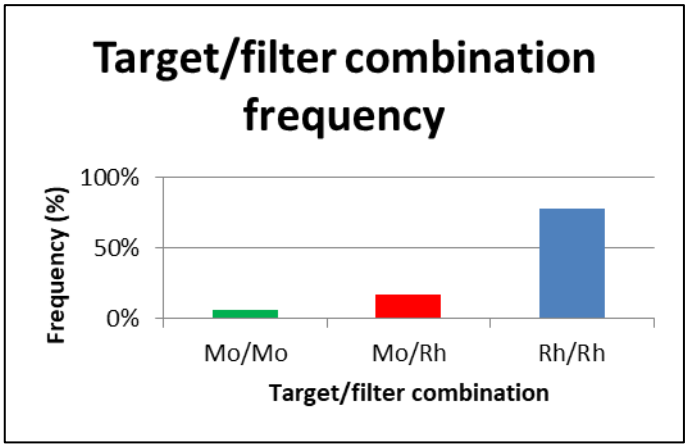


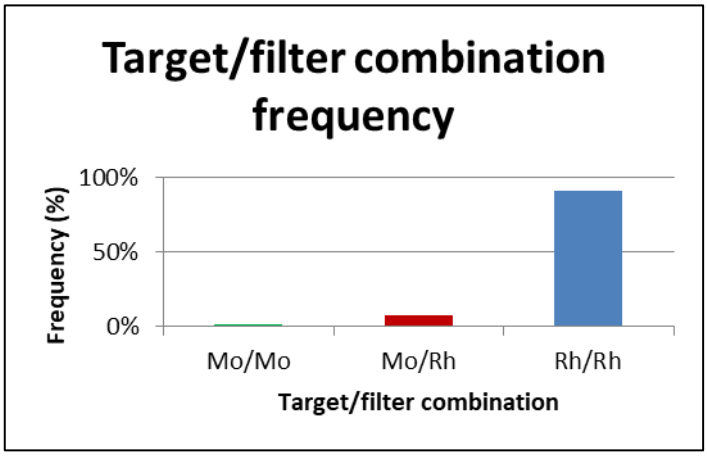
Fig. 9: Average kVp and mAs values by breast thickness ranges during exams for the respective target/filter combinations of the tube: (1) Mo/Mo; (2) Mo/Rh; (3) Rh/Rh. They are illustrated, respectively, as follows: (a), (b) and (c) for UNIT 1; (d), (e) and (f) for UNIT 2; and (g), (h) and (i) for UNIT 3



(a)



(b)



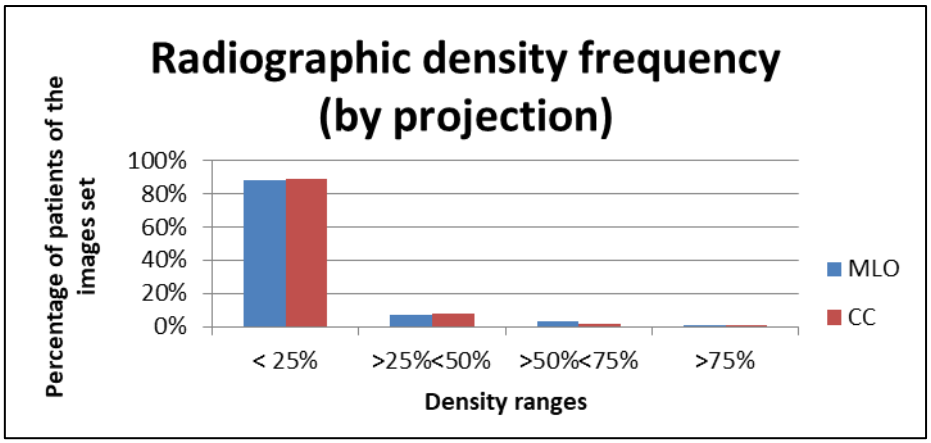
(c)

Fig. 10: Percentage of Cases for the Target/filter Combinations used: (a) UNIT 1; (b) UNIT 2; (c) UNIT 3

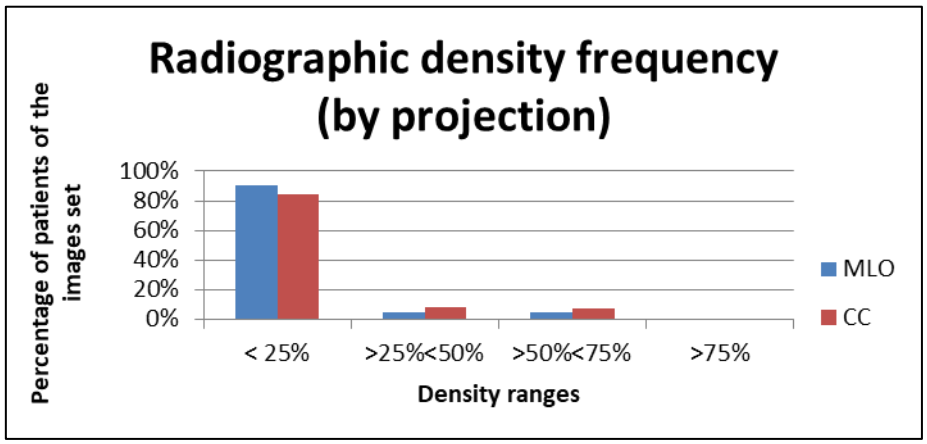
3.3 Determining the Breast Areas and Radiographic Density from the Mammography Images

Additionally to the data shown in the previous sections, we have determined both the sizes of the breast areas relative to those images and the radiographic density of each one by applying the most current version of the LIBRA software (Breast Imaging Group, UPenn) [11] on all image datasets obtained from the 3 mammography Units. Consequently, it was possible to determine the profile of these 3 datasets in terms of radiographic density variation (in BIRADS categories, for example) and the size of breast areas in patients from those centers. This section

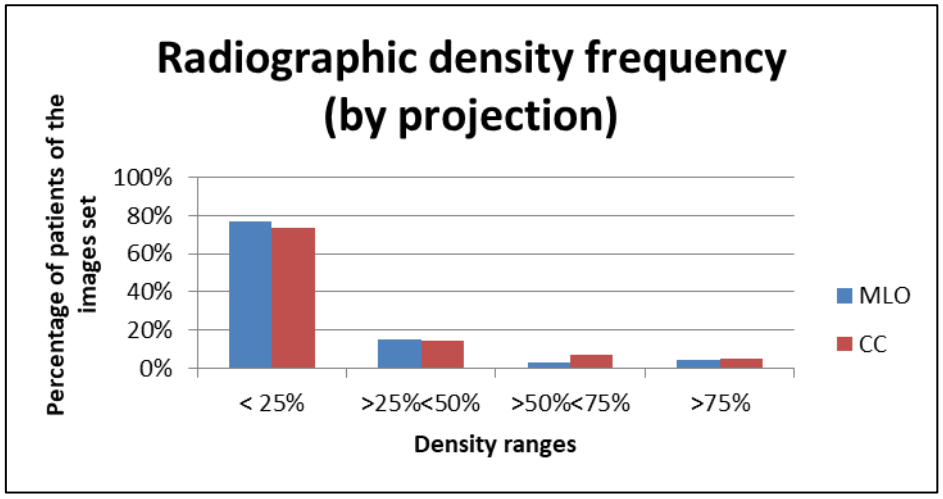
categories, for example) and the size of breast areas in patients from those centers. This section shows graphical representations illustrating these profiles. The radiographic density profiles by breast projection (CC and MLO) are illustrated in Fig. 11 (a, b and c, respectively for Units 1, 2 and 3). And Fig. 12 illustrates the profile corresponding to the percentage of patients by the size ranges of breast areas – considering also the two projections (CC and MLO).



(a)

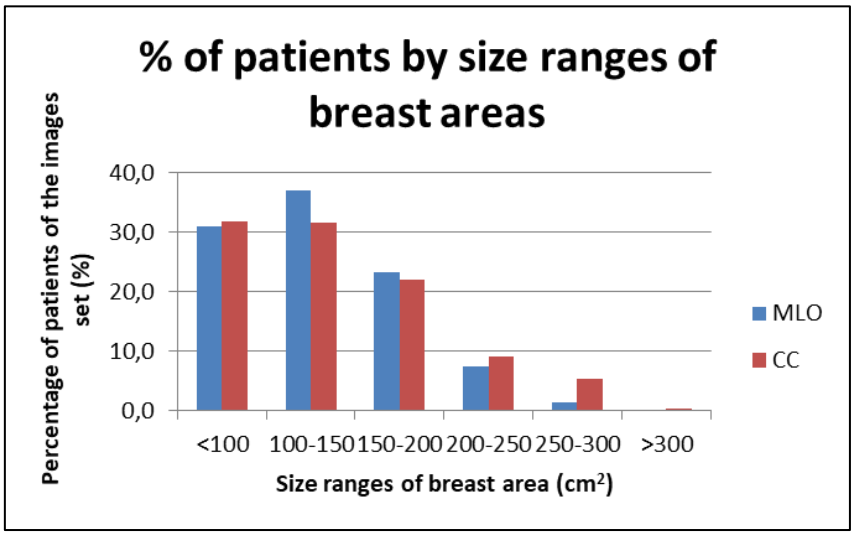


(b)

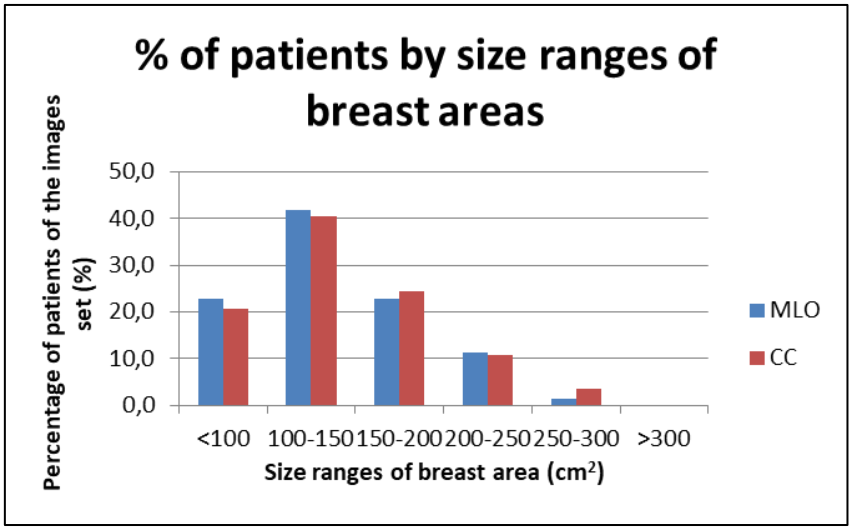


(c)

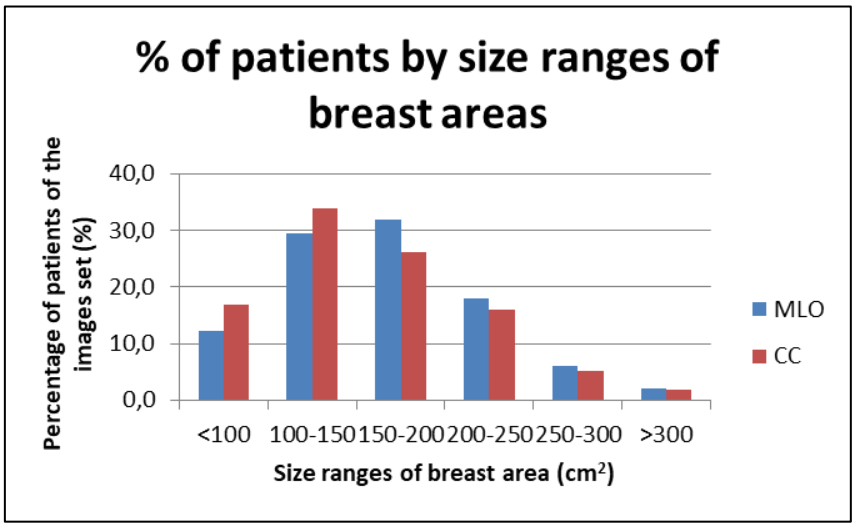
Fig. 11: Profile of Percentage of Images in the Set in each of the 4 BIRADS Radiographic Density Intervals for both Images Projections (CC and MLO): (a) UNIT 1; (b) UNIT 2; (c) UNIT 3



(a)



(b)



(c)

Fig. 12: Profile of Percentage of Patients in each dataset in 6 Ranges of Average breast area size, Considering the CC and MLO Projections: (a) UNIT 1; (b) UNIT 2; (c) UNIT 3

IV. DISCUSSION

The dataset acquired in this study was quite extensive, and the data acquisition process for subsequent analysis was significantly facilitated by the storage capabilities provided by the *ReadDICOM* program [9]. Firstly we primarily focus on the dose profile generated by the systems, along with other statistically relevant profiles of interest to radiology services administration. Regarding the time required for processing and obtaining the base spreadsheet, it was found that the survey for the most extensive image set (1,367 images) took less than 1 minute.

The following subsections will present many comparisons between the 3 systems involved in this investigation, based on the data extracted from the DICOM files recorded and graphically presented in the previous section.

4.1 Comparison of Population Profiles

The primary findings from the comparison of sets of patients undergoing examinations in the three investigated systems are as follows:

a) The average age of patients in the respective groups is approximately 50-60 years, with mean ages of 59, 57 and 52 years for individuals undergoing exams in radiological services of Units 1, 2 and 3, respectively;
b) The average breast thickness, as subjected to examinations, notably exceeds the conventional recommendations typically employed in quality control and phantoms tests (which typically employ an average thickness of 45mm for a breast with 50/50% fibro glandular/adipose tissue): nearly 49mm for Unit 1 group, 56mm for the Unit 2 group, and remarkably, 62.5mm for patients submitted to exams in Unit 3.

These data hold significant implications. They suggest a potential need for healthcare professionals responsible for these services to reevaluate examination procedures and closely observe radiation dose levels produced by the equipment, as this factor is highly dependent on breast thickness during exposure. Moreover, these insights offer valuable directions for the development of techniques and phantoms aimed at quality assessment of the imaging systems. It is also noteworthy that these findings characterize the population profile served by these public radiology services, encompassing both routine and diagnostic examinations.

4.2 Dosimetry Profiles

The ability to swiftly and easily survey dosimetry profiles for each set of equipment through this application represents a significant advantage in terms of a quality evaluation tool for system performance. In a general overview based on the various graphs for each set, the behavior of all three systems aligned with expectations.

Since the most critical aspects of mammography quality control are currently centered on Mean Glandular Dose (MGD), we will not extensively explore the results of Skin Entrance Dose (SED). It is worth noting that, on average, SED records lower values for the mammography Units 1 and 3 (often falling below 9.0 mGy, except for very thick breasts exceeding 80mm, especially in the latter). Conversely, for the Unit 2 equipment, SED reaches 10 mGy or higher for breast thicknesses above 60mm. Even so, data from all Units are satisfactorily reporting average SED around 8.0-9.0%, as shown in Table 1. Still considering the results summarized in that Table, only for Unit 1 data show that worryingly more than 50% of the patients in the group under study received SED above the average value. For the other two mammography services, these numbers were between 38 and 42%. Even so, the proportion of patients who received a SED exceeding the average value plus the calculated standard deviation, relative to the total number of patients, remained below 13% for Units 2 and 3. In contrast, for Unit 1, it was slightly higher, approximately around 18%. These numbers may be attributed to cases where multiple breast exposures were required for clinical reasons.

Regarding the MGD profiles for the three units, two comparisons are of interest: one relative to the recorded values compared to the recommendations outlined in norms and guidelines; and the other comparing the values recorded among the three units (since all correspond to similar models from the same

manufacturer). Therefore, from an initial analysis of the graphs presented in Figure 5:

a) Mammography Unit 1 exhibited MGD levels within the acceptable range according to international standards. However, it is worth noting that the lower thickness ranges exhibit average MGD values approximately 50% higher than both the acceptable and desirable values, with values reaching the upper limits for the next range (41-50 mm) and falling below the "limits" for the larger thickness ranges. It is important to note that, for this equipment, the majority of patients had breast thicknesses ranging from 43 to 60 mm (Figure 1), encompassing 435 images within this interval, and their average MGD values align with the standards. Furthermore, instances where slightly elevated MGD is recorded in the lower thickness ranges are associated with low absolute values (around 1.5 mGy).
b) A similar pattern is observed in the analysis of the graph presented for the mammography Unit 2. Once again, the average MGD values recorded for the lower thickness ranges (21-30 mm and 31-40 mm) were in close proximity to their respective limits. When compared to the "desirable" values, which are adopted by Brazilian standards and are more restrictive, it becomes evident that they are slightly higher (approximately 20% higher in the lower thickness range and up to 50% higher between 31-40 mm). For the other thickness ranges, the MGD levels are comfortably below both the acceptable and desirable limits as outlined in the standards.
c) The mammography Unit 3 demonstrates a more consistent alignment with international standards in terms of average MGD values. The only exception is the 31-40 mm thickness range, where the recorded MGD reaches 2.0 mGy (compared to an "acceptable" value of 1.5 mGy and a "desirable" value of 1.0 mGy). However, this particular observation, while warranting some attention, does not appear to be significantly concerning. This is due to the fact that the majority of patients in the dataset had breast thicknesses ranging from 50 to 74 mm, encompassing 930 images in the evaluated group, with average MGD values well below both the acceptable and desirable limits.
d) It is noteworthy that the primary MGD distribution ranges for each equipment are as follows: for Unit 1, they range from 1.8 to 2.4 mGy; for the mammography Unit 2, they fall between 1.0 and 2.0 mGy; and for Unit 3, they extend from 1.2 to 1.8 mGy. Additionally, there is a notable subset within the Unit 3 distribution that falls between 2.2 and 2.6 mGy, primarily attributable to the group with the thickest breasts among all the analyzed.
e) In comparative terms, the MGD profiles for all three Units exhibit remarkable similarity, particularly between the Units 2 and 3, whose overall MGD profiles closely resemble each other despite differences in the number of cases/patients included. The MGD profile for Unit 1, on the other hand, displays a slight divergence, characterized by an unexpected decrease in dose values for thicker breasts. Unfortunately, further comparisons with this equipment are no longer feasible, as the corresponding radiology service has replaced it with a new different system capable of performing breast tomosynthesis exams.

It is also of interest to note that the average values of SED and MGD tend to decrease with the patients age (according to Fig. 7 and 8). It is worth highlighting that those profiles show that the average MGD for all age groups within each set remains consistently limited in the range of 1.0 to 2.5 mGy for Unit 2 set, with minor variations in the lower limits for the other systems (1.5-2.5 mGy for Unit 1 and 1.2-2.5 mGy for Unit 3). This confirms the primary results of average MGD by patients shown earlier in Table 1.

4.3 X-ray Spectrum Profiles

The graphs presented in Figure 9 illustrate operational parameter profiles of the mammography systems, specifically in relation to the target/filter combinations used during examinations. These profiles are depicted across various breast thickness ranges exposed to the systems. Notably, there are certain similarities among the three systems:

a) For the Mo/Mo target/filter combination, all three systems exhibit nearly constant behavior, maintaining an average energy level of approximately 26 kVp across all breast thickness ranges.
b) Similarly, for the Rh/Rh target/filter combination, all three systems operate within a range of 29 to 30 kVp across different thickness ranges. However, it's worth mentioning that the mammography Units 2 and 3 reach 30 kVp primarily for very thick breast tissue (above 70mm).
c) In contrast, for the Mo/Rh target/filter combination, there is a noticeable difference. The Units 1 and 3 operate with energy levels between 26 and 27 kVp. In contrast, Unit 2 exhibits a higher energy profile, operating between 29 and 30 kVp. This variance may be an adjustment to compensate for the fact that, within this same combination, the Exposure (mAs) value recorded by the Unit 2 system is considerably lower compared to the other two. Unit 2 records exposures between 64 and 72 mAs, while the other two systems show a broader range, varying from 60 to 100 mAs (Unit 1) and 50 to even 200 mAs, especially for breast thickness ranges above 70mm, in the case of Unit 3.

The operational parameter profiles also reveal significant differences in the recorded values across the three sets. Notably, for the Mo/Mo combination, the Unit 3 set maintains a nearly constant exposure level of around 200 mAs. In contrast, the Unit 2 set does not exceed 100 mAs, and the Unit 1 set records even lower values, ranging from 40 to 80 mAs. These differences can be attributed to the typical breast thicknesses and densities registered in each set's patient population, with the group corresponding to Unit 3 characterized by notably thicker breast tissue.

However, it is important to note that a more comprehensive comparison can be made by considering the most frequently used condition, which is the Rh/Rh target/filter combination. Remarkably, between 70% and 80% of all images in the analyzed datasets were produced using the Rh/Rh combination. This observation aligns with expectations, especially in the case of the Unit 3 dataset, where higher average breast thicknesses are registered.

In the comparison of profiles across the three groups, one notable difference is the recorded mAs values in the Unit 1 group. Interestingly, a decline in mAs values is observed as breast thickness increases, ranging from 120 mAs for thicknesses in the 31-40mm range to approximately 80 mAs for thicknesses above 70mm. In contrast, both the mammography units 2 and 3 exhibit a different pattern, which is relatively consistent between them. These systems show increasing mAs values as breast thickness ranges increase, ranging from 60 to 140 mAs for the former and from 50 to 170 mAs for the latter. This behavior aligns with expectations for these cases, where higher breast thickness typically requires higher exposure settings to maintain image quality.

This distinction in mAs behavior among the groups may reflect variations in patient populations, breast tissue characteristics, or specific clinical practices at each radiology service, featuring the importance of considering these factors in dose optimization and quality control efforts.

4.4 Radiographic Density Profiles

The analyses performed so far have been based on the use of the software previously developed [9] applied to the image datasets under consideration. We complemented this analysis by leveraging the LIBRA software (Breast Imaging Group, UPenn) [11]. This freely accessible software provides, in addition to the original and segmented images and a histogram of the analysis, three essential pieces of information: the size (in cm^2) of the total area of the cropped breast, the size (also in cm^2) of the segmented area, and the ratio (expressed as a percentage) between them, which the program defines as the radiographic density of the breast. These data, along with other attributes related to each image (such as whether it is a CC or MLO projection, left or right, etc), are recorded within a spreadsheet. The information derived from LIBRA led to additional graphical representations documented in Fig. 11 and 12, focusing on the relationships

among the Average Radiographic Density per patient, the percentage of cases within the four classic density intervals defined by BIRADS, as well as the average and maximum breast area sizes, considering MLO and CC projections.

From these graphs, it is interesting to highlight an observation: in all of them, according to LIBRA results, the overwhelming majority of patients undergoing examinations are in BIRADS category A, i.e., breasts with radiographic densities lower than 25% (almost 90% of cases for Units 1 and 2 sets, and almost 80% for Unit 3 set). The groups corresponding to category B (densities between 25 and 50%) practically complete the sets, representing about 10% of cases. Tests with an older version of that program did not change this result, which, however, is somewhat surprising since it does not exactly reflect what is usually observed in radiology routine (where there is a greater distribution of cases between densities up to 75%, at least) and therefore deserves further investigation.

Regarding breast area profiles, it is interesting to note that these data complement well the results related to the average breast thicknesses of the patients examined in each of those services. They show that the majority of patients have breast areas ranging from 100 to 200 cm^2. In more detail: (a) from the Unit 1 set, just over 30% correspond to areas of 100 to 150 cm^2, another 30% have an area smaller than 100 cm^2, and 23% are between 150 and 200 cm^2; (b) from the Unit 2 set, 40% of breasts are in the range of 100 to 150 cm^2 (21% are smaller than 100 cm^2, and 22% are between 150 and 200 cm^2); and (c) from the Unit 3 set, about 33% are between 100 and 150 cm^2, and another 28% are between 150 and 200 cm^2.

V. CONCLUSION

The DICOM header information included in the images is a valuable asset for the study outlined in this article. The extensive data stored within the image files played an essential role in establishing profiles with meaningful correlations and outcomes regarding patient demographics, radiation doses they were exposed to, and parameters of the hospital's mammography system. The use of the previously developed *ReadDICOM* tool [9] significantly streamlined this process.

It is important to note that, despite the extensive number of exposures included in this study, certain instances with smaller sample sizes (such as extreme cases of age or breast thickness or less commonly used target/filter combinations) exhibited biased results. Consequently, for future extensions of the study, increasing the number of exposures would be useful to enable a more comprehensive and representative analysis of the patient population in a particular radiological service. Additionally, for supplementary investigations, incorporating exposures from different models of digital mammography equipment could yield valuable insights into radiation doses and operational parameters.

In our particular study, three important aspects could be highlighted based on the analysis of population profiles and dose records in the investigated radiological services. The average breast thickness ranged from approximately 50mm to 62mm, depending on the radiology service considered, indicating values above what is typically used as a standard for conventional quality assurance programs (e.g., in phantoms used for tests). The average age of the patients ranged from 52 to 60 years, indicating a prevalence of non-elderly women in the evaluated group. Despite this, the analysis of radiographic density of the images showed a significant presence of BIRADS A cases in the same group (even for the mammographic Unit corresponding to the population with the lowest average age).

Finally, all the equipment produced average glandular dose profiles within the limits recommended by international standards and norms – although in some cases there were occasional "deviations", almost always due to thicker breasts. This is an important conclusion as it demonstrates that the present work, through the scan obtained by the *ReadDICOM* application, rapidly and practically detected the dosimetry profiles of each investigated mammography equipment, enabling its use to optimize the management process of their respective radiological services.

In conclusion, the significance of analyses like the one conducted in this investigation cannot be overstated. As previously emphasized, mammography examinations play a primary role in the early detection of breast cancer, and should be conducted routinely throughout a woman's adult life. Hence, comprehending the patient population profiles and the radiation doses they are exposed to during these examinations is valuable – especially for the management of the mammography service. In fact, having access to information such as those presented in this study makes it easier to implement progressively substantial safety measures to the process.

ACKNOWLEDGEMENTS

The authors are thankful to FAPESP for the financial support, and also to the Management of Education & Research of University Hospital of Federal University of São Carlos (SP, Brazil) - Brazilian Company of Hospital Services (EBSERH).

REFERENCES

1. WORLD HEALTH ORGANIZATION CANCER. World Health Organization. 2021. <https://www.who.int/health-topics/cancer#tab=tab_1>. Acessed: Jul 25 2023 .
2. Doi K., Giger M. L., Nishiskawa R. M., Schmidt R. A. 1996. *Digital mammography*, Excepta Medica, Elsevier, (The Netherlands), Int. Congress Series n. 1119, 481 p.
3. IEC 61223-3: Evaluation and routine testing in medical imaging departments - Part 1: General Aspects. [s.l: s.n.]. (1993).
4. Monsees B.S. 2000. The mammography quality standards act: an overview of the regulations and guidance. (doi: 10.1016/500 33-8389(05)70199-8).
5. Perry N., Broeders M., Wolf C. D.,Tomberg S, Holland R., Von Kersa L. 2008. Europeans guidelines for quality assurance in breast cancer screening and diagnosis. European Commission,(www.euref.org/downloads?download=24:european-guidelines-for-quality-assurance-in-breast-cancer-screening-and-diagnosis-pdf). ISBN 92-79-01258-4.
6. Kotre C. J. 2011. Statistical analysis of mammographic breast composition measurements: towards a quantitative measure of realtive breast cancer risk. *Br. J. Radiol.*, 84:153-160.
7. NEMA. Digital Imaging and Communications in Medicine (DICOM). Part 6: Data Dictionary. Tech. Rep. ; Rosslyn, VA, 2016.
8. Barufaldi B, Schiabel H, Maidment ADA. 2019. Design and implementation of a radiation dose tracking and reporting system for mammography and digital breast tomosynthesis. *Phys. Medica*, 58: 131-140. (doi: 10.1016/j.ejmp.2019.02.011) .
9. Schiabel H., Barufaldi B., Ruberti Filha, E. M. 2019. Investigations on a computer application for tracking the mean glandular breast dose profile in mammography, *XV Mediterranean Conference on Medical and Biological Engineering and Computing – IFMBE Proceedings book series*, v. 76, p. 869-873, Coimbra, Portugal, (https://doi.org/10.1007/978-3-030-31635-8_104).
10. Dance D.R., Young K.C., Van Engen R.E. 2009. Further factors for the estimation of mean glandular dose using the United Kingdom, European and IAEA breast dosimetry protocols. *Physics in Medicine and Biology* 54 (14), 4361–4372.
11. Keller B. M., Nathan D. L., Wang Y., Zheng G. Y., Gee J. C., Conant E. F., Kontos D. 2012. Estimation of breast percent density in raw and processed full field digital mammography images via adaptive fuzzy c-means clustering and support vector machine segmentation. *Medical Physics*, v. 39, n. 8, p. 4903–4917.
12. IAEA. Quality Assurance Programme for Digital Mammography. Vienna, Austria: [s.n.]. 2011

This page is intentionally left blank

Depression in the Elderly in a Permanent Geriatric Stay

MTFS Claudia Marcela Cantú Sánchez, MCE Greever María Avila Sánsores, Dr. Gerardo Ruvalcaba Palacios & Dra. Ma. Gloria Vega Argote

University of Guanajuato

SUMMARY

Human aging is a gradual and adaptive process of a biological, psychological and social nature, produced as a consequence of genetically programmed changes, history, lifestyles, environment and social conditions to which the person was exposed. On the other hand, old age is a stage of life whose beginning is established by society, which is why the United Nations agreed that, in developing countries, people aged 60 and over are classified as older adults.

The above is considered important because during aging structural and functional changes occur in different organs and systems. For this reason, as health professionals, we must know the normal morphological and functional changes of physiological aging, and thus guide the older adult to adapt and improve their lifestyle. Detection of depression in older adults and its treatment is of vital importance to improve the quality of life of older adults.

Keywords: depression, older adults, geriatric stay.

Classification: NLMC Code: WT 104

Language: English

Great Britain Journals Press

LJP Copyright ID: 392822

London Journal of Medical and Health Research

Volume 23 | Issue 11 | Compilation 1.0

Depression in the Elderly in a Permanent Geriatric Stay

Depresión en El Adulto Mayor De Una Estancia Geriátrica Permanente

*MTFS Claudia Marcela Cantú Sánchez[α], MCE Greever María Avila Sánsores[σ], Dr. Gerardo Ruvalcaba Palacios[Ↄ] & Dra. Ma. Gloria Vega Argote[¥]

RESUMEN

El envejecimiento humano es un proceso gradual y adaptativo de tipo biológico, psicológico y social, producido como consecuencia de cambios genéticamente programados, historia, estilos de vida, ambiente y condiciones sociales a las que estuvo expuesta la persona. En cambio, la vejez es una etapa de la vida cuyo inicio lo establece la sociedad, de ahí que la Organización de las Naciones Unidas acordó que, en los países en desarrollo, se catalogue como adultos mayores a las personas de 60 y más años.

Lo anterior se considera importante porque durante el envejecimiento se producen cambios estructurales y funcionales en diferentes órganos y sistemas. Por tal motivo, como profesionales de la salud, debemos de conocer los cambios morfológicos y funcionales normales del envejecimiento fisiológico, y así orientar al adulto mayor para que adecue y mejore su estilo de vida. La detección de la depresión en el adulto mayor y su tratamiento es de vital importancia para mejorar la calidad de vida del adulto mayor.

Palabras clave: Depresión, Adulto mayor, estancia geriátrica.

SUMMARY

Human aging is a gradual and adaptive process of a biological, psychological and social nature, produced as a consequence of genetically programmed changes, history, lifestyles, environment and social conditions to which the person was exposed. On the other hand, old age is a stage of life whose beginning is established by society, which is why the United Nations agreed that, in developing countries, people aged 60 and over are classified as older adults.

The above is considered important because during aging structural and functional changes occur in different organs and systems. For this reason, as health professionals, we must know the normal morphological and functional changes of physiological aging, and thus guide the older adult to adapt and improve their lifestyle. Detection of depression in older adults and its treatment is of vital importance to improve the quality of life of older adults.

Keywords: depression, older adults, geriatric stay.

Author α: MTFS Claudia Marcela Cantú Sánchez. Profesor de Tiempo Completo. Doctorante en Desarrollo Humano, Departamento de Enfermería y Obstetricia. División de Ciencias de la vida, Universidad de Guanajuato, México. Línea de Investigación Promoción de la salud y cuidado en grupos vulnerables.

σ: MCE Greever María Avila Sánsores. Profesor de Tiempo Completo. Departamento de Enfermería y Obstetricia de Irapuato. División de Ciencias de la Vida. Universidad de Guanajuato. México. Línea de Investigación Prevención y estados crónicos del adulto.

Ↄ: Dr. Gerardo Ruvalcaba Palacios. Profesor de Tiempo Completo. Departamento de Enfermería y Obstetricia de Irapuato. División de Ciencias de la Vida. Universidad de Guanajuato. México.
Línea de Investigación Prevención y estados crónicos del adulto.

¥: Dra. Ma. Gloria Vega Argote. Profesor de Tiempo Completo. Departamento de Enfermería y Obstetricia de Irapuato. División de Ciencias de la Vida. Universidad de Guanajuato. México. Línea de Investigación Prevención y estados crónicos del adulto.

London Journal of Medical & Health Research

I. INTRODUCCIÓN

El envejecimiento humano es un proceso gradual y adaptativo de tipo biológico, psicológico y social, producido como consecuencia de cambios genéticamente programados, historia, estilos de vida, ambiente y condiciones sociales a las que estuvo expuesta la persona. En cambio, la vejez es una etapa de la vida cuyo inicio lo establece la sociedad, de ahí que la Organización de las Naciones Unidas acordó que, en los países en desarrollo, se catalogue como adultos mayores a las personas de 60 y más años.

Dentro del presente trabajo, se pretende obtener un diagnóstico en el cual se muestre la situación actual de los pacientes de una estancia geriátrica permanente ubicado en Irapuato, Guanajuato. Esta institución ofrece un tipo de estancia permanente con dos modalidades: la primera es la habitación compartida y la otra opción es la habitación privada; estas modalidades dependerán si el adulto mayor ingresa con un programa gratuito o si puede pagar un programa con una mensualidad de $3,000.00 pesos, respectivamente. Cuenta con un horario de visitas de 09:00 a 18:00 horas. Aquí, ofrecen servicios para adultos con discapacidad física, adultos con discapacidad mental o adultos en abandono. A esta población se ofrece un servicio de supervisión de toma de alimentos, los cuales se sirven tres veces al día, seguimiento diario de signos vitales, terapias y actividades recreativas, aseo diario, capilla, acceso a jardines y proporción de silla de ruedas si es necesario.

II. ANTECEDENTES

Se debe brindar una preparación sobre el envejecimiento a las nuevas generaciones a través de hábitos saludables desde las primeras etapas de la vida, se requiere que el hombre sea visto de forma holística para atender y prever un futuro de los adultos mayores con atención médica adecuada. (Navarro, Ojeda, Ortega, Moreno, 2014). Allevato y Gaviria, 2008, afirman que el envejecimiento no solo es un fenómeno cronológico, sino que es un fenómeno multifactorial que afecta todos los niveles de organización a nivel molecular en órganos y sistemas de manera inevitable, debido a que la esperanza media de vida ha aumentado en el último siglo a un promedio de 65 y más años y sigue aumentando.

En los países de ingresos bajos y medio la mortalidad ha bajado en la infancia, los nacimientos y enfermedades infecciosas se han reducido, gracias a los programas de promoción de la salud y en el adulto mayor los problemas de salud son debido a la aparición de enfermedades crónicas debido a hábitos poco saludables, que son frecuentes, aunado a la poca cobertura en seguridad social y de servicios de salud (OMS, 2015). La necesidad actual relacionada con el envejecimiento poblacional es el mantenimiento de la salud y la calidad de vida. Ya que la esperanza de vida al nacer aumento 40 años desde el siglo XII y el 50% de las personas que nacieron en el año 2000 vivirán en el año 2072, muriendo primero los hombres, causado por el estilo de vida. (Hernández, 2014).

En México se ha presentado un rápido crecimiento demográfico de los años 1930 a 1970 caracterizado por la transición demográfica con base ancha y hacia la porción superior con estrechez. La tasa para 1970 de crecimiento fue la más alta de la historia del país con una fecundidad promedio de 7 hijos por mujer, lo que provocó la difusión de campañas de planificación familiar ubicando a la mujer en el ámbito laboral (Mendoza, 1998 en Ortiz Álvarez y Mendoza, 2008). De acuerdo con la pirámide poblacional en el estado de Guanajuato se visualizó un aumento en el grupo etáreo de Adultos Mayores del 6.5% en el año 2000 y del 13.9% en el año 2015, y donde será más notable por su rapidez será en el corredor Industrial que incluye a la ciudad de León, Irapuato y Celaya. Los problemas de salud que se presentan con más frecuencia son: diabetes, cáncer, neumonía, depresión, sordera, ceguera, enfermedades no identificadas por proceso de envejecimiento. (Navarro, Ojeda, Ortega, Moreno, 2014).

De acuerdo al Diario Oficial de la Federación las condiciones de vulnerabilidad de los adultos mayores se han agudizado por el rápido crecimiento de la población de adultos mayores

esto, provoca que aumente la demanda de los servicios que brindan asistencia, por lo tanto, se debe mejorar la atención de manera eficaz, rigiendo la atención de los adultos mayores con la NOM-167-SSA1-1997, sobre asistencia social. Prestación de servicios de asistencia social a adultos y adultos mayores en situación de riesgo y vulnerabilidad, siendo obligatoria en todo el territorio nacional tanto en los sectores, público, privado y social.

Se convierte en un problema en la sociedad mercantilista y productiva, cuando el individuo ya no puede trabajar, aunado a un sistema familiar nuclear predominante, rechazando a las generaciones adultas para condenarlas a residir de forma independiente del resto de la familia. Muchas veces son ayudados de forma económica por los hijos, perdiendo su autoridad en la familia, en ocasiones son ingresados en asilos que les brinden los cuidados necesarios, en donde pocas veces son visitados quedando expulsados del seno familiar. Siendo más característico en las zonas urbanas y rurales el conservar su lugar dentro de la familia. (Gascón, 2009).

La familia de acuerdo a Novel, 2011, afirma que es la unidad básica de la sociedad que interactúan entre sí es por esto que podemos llamar que funcionan como un sistema abierto ya que se juegan ciertos roles para la distribución de tareas a esto le llamamos funciones familiares, cada miembro de la unidad familiar es un subsistema ya que posee características de la familia en general pero además se relaciona con la sociedad y toma valores y creencias de esta mezclándolo con los de su origen, es transmisor hacia otros miembros de la sociedad, el adulto mayor se puede encontrar en una familia extensa que es característica de las sociedades preindustriales y es que en este sistema hombres y mujeres se casan pero continúan viviendo con la familia de origen y se siguen respetando las jerarquías entre los miembros, a diferencia de la familia nuclear que solo está constituida por el padre, la madre, e hijos o hijas, existe la división de tareas, solamente entre estos miembros.

Por lo anterior se pretende que se aplique en el adulto mayor mexicano, un modelo centrado básicamente en la funcionalidad, implicando los cambios de paradigmas sobre la curación y centrarse en el autocuidado para lograr el bienestar, garantizando la autonomía. Además, debemos conocer el apoyo de la familia del adulto mayor que juega un papel importante en el bienestar a través del afecto, respeto y muchos de ellos necesitan ayuda al realizar las actividades de la vida diaria desde caminar, alimentarse, vestirse y bañarse. Estos grupos seguirán experimentando una serie de cambios biopsicosociales. Es de vital importancia la familia en el adulto mayor siendo su principal cuidadora, al brindar apoyo tanto físico, emocional, social y económico. (Navarro, Ojeda, Ortega, Moreno, 2014).

Es por esto que debemos apostar en la educación y sobre todo del adulto mayor, pero no esperar a que envejezcamos sino desde la infancia crear conciencia como individuos para mejorar nuestra calidad de vida con expectativas productivas, por lo que se han logrado varias metas en cuanto a la educación básica, media y superior. Existen algunos problemas económicos de los países que provocan el desempleo de larga duración y es que los empleos para los jóvenes son de baja calidad, se habla de una sobre-educación por el exceso de competencias que el joven adquiere contra una sub-educación, se habla que el joven lleva mucho tiempo hasta 6 en establecerse en un empleo formal, y muchas de estas condiciones no son las adecuadas ya que se involucran en trabajos como los llamados empleos temporales, todo esto lo podemos ver a diferencia de un adulto mayor, que por lo regular son jubilados o así era el ideal de los tiempos de generaciones pasadas, y ahora podemos ver que la tasa de desempleo es de las más severas de los últimos años.

Si aterrizamos estos cambios en México, se provocó una caída importante en la producción y por lo tanto en el empleo, hubo reajustes en el mercado laboral favoreciendo el empleo informal, afectando las exportaciones de la manufactura, esta crisis que hasta hoy no se ha podido superar. Además, aunado a la migración de los jóvenes para buscar una mejor calidad de vida en otro país, dejando a estos padres adultos mayores sin el apoyo cercano que necesitan, algo con lo que tiene que trabajar el gobierno es con el

crecimiento económico enfocándose en los sectores más vulnerables de nuestro país.

Según Lugo, et al. (2014) Se espera que para el año 2020 aumentara la cantidad de adultos mayores, es por esto que se debe contar con la creación de empresas al cuidado de ellos, y con esto un crecimiento en las áreas de enfermería, optometría, odontología y especialidades médicas enfocadas en el adulto mayor, se pudiera pensar en casas de reposo, asilos o centros de día para los adultos mayores que fungen como guarderías pero además realizarían actividades recreativas para el cuidado de su salud, el personal que está a cargo debe contar con los conocimientos científico-humanos para la mejor atención con calidad y calidez, creo que en este mundo que ha entrado en la globalización sería una de las mejores opciones para poder ir generando empleos.

III. ANSIEDAD

La ansiedad es un sentimiento de peligro inminente que incluye tensión y angustia; a nivel fisiológico, activa el sistema nervioso simpático y origina reacciones tan conocidas como latidos del corazón acelerados, presión arterial elevada, sudoración, temblores, respiración rápida y tensión muscular. A pesar de que la ansiedad es desagradable, es normal y útil.

La ansiedad es la más común y universal de las emociones, es una sensación o un estado emocional normal ante determinadas situaciones y que constituye una respuesta habitual a diferentes situaciones cotidianas estresantes. Tan solo cuando sobrepasa cierta intensidad o supera la capacidad adaptativa de la persona, es cuando la ansiedad se convierte en patológica y provoca malestar significativo con síntomas que afectan tanto al plano físico, como al psicológico y conductual. Los trastornos de ansiedad son más frecuentes que cualquier otro tipo de alteración psiquiátrica. No obstante, a menudo pasan desapercibidos y, por tanto, no se tratan. Se realiza este manual con el objetivo de brindar a los médicos de la atención primaria de salud recursos que le permitan establecer el diagnóstico de los trastornos ansiosos, así como indicar una terapéutica adecuada, mediante la utilización de algoritmos diagnósticos, que permiten identificar las manifestaciones psicopatológicas de cada forma clínica y su conducta farmacológica psicológica.

Los trastornos de ansiedad son, junto con los trastornos del ánimo, los que más contribuyen a la morbimortalidad a través del sufrimiento que generan y los que más repercuten en las economías nacionales. Todos enfrentamos ansiedad personal y miedos que son parte de nuestra vida cotidiana, pero si la ansiedad y los miedos son permanentes y abrumadores e interfieren de forma drástica en la vida cotidiana de forma desproporcionada y demasiado prolongada, constituye una ansiedad patológica o anormal. La ansiedad es la más común y universal de las emociones, reacción de tensión sin causa aparente, más difusa y menos focalizada que los miedos. Es importante entender la ansiedad como una sensación o un estado emocional normal ante determinadas situaciones y que constituye una respuesta habitual a diferentes situaciones cotidianas estresantes. Así, cierto grado de ansiedad es incluso deseable para el manejo normal de las exigencias del día a día. Tan solo cuando sobrepasa cierta intensidad o supera la capacidad adaptativa de la persona, es cuando la ansiedad se convierte en patológica, provocando malestar significativo con síntomas que afectan tanto al plano físico, como al psicológico y conductual.

IV. DEPRESIÓN

La depresión es una alteración del humor en la que destaca un ánimo deprimido, falta de energía y/o pérdida de interés, o de la capacidad para disfrutar u obtener placer (anhedonia), que afecta la vida de la persona, durante la mayor parte del día y durante al menos dos semanas.

En los últimos años la depresión ha sido catalogada como uno de los problemas que más sufrimiento causa en las personas y en distintos grados afecta a un porcentaje muy alto de la población sin diferencia de edad, género y nivel socioeconómico; convirtiéndola en uno de los principales motivos de consulta clínica. Carranza

2012, menciona que en los estudiantes universitarios la depresión puede constituir un problema de real importancia, pues al malestar psicológico del individuo se agrega la imposibilidad de obtener un rendimiento académico satisfactorio debido a que las funciones cognoscitivas se alteran sensiblemente cuando se presenta esta entidad nosológica (depresión).

Además, el estudiante universitario se enfrenta con una nueva realidad que, muchas veces, lo abruma y parece superar sus posibilidades de adaptación. (Riveros, Hernández y Rivera, 2007). La depresión puede ser desencadenada por cualquier cambio de vida estresante, incluso si es un cambio drástico en la vida normal y habitual, por ejemplo, el cambio es elegido como el caso de una carrera universitaria. El ingreso a la universidad suele ser el primer cambio importante en la vida de un joven adulto. En esta fase de transición, los estudiantes suelen enfrentar problemas tales como: nuevos arreglos de vida, necesidad de supervisar el horario de uno mismo, atender las necesidades propias (horarios para comer, lavar la ropa, dormir y trabajar), presión académica, responsabilidades financieras, cambios en las relaciones con la familia y los amigos, presiones debido a las relaciones nuevas, aumento de la consciencia de identidad sexual, preocupaciones sobre la vida después de la graduación, etc. De otro lado, es importante diferenciar la depresión de la tristeza. La tristeza es un estado de ánimo pasajero, provocado por una situación concreta, como, por ejemplo, la muerte de un ser querido. Cuando este estado de ánimo perdura en el tiempo, podemos estar frente a una depresión. Según el NIMH (2001), los siguientes síntomas pueden considerarse como indicadores de la depresión: un estado de ánimo triste o ansioso persistente al igual que sensaciones de desesperanza, el pesimismo, la culpabilidad, la impotencia, la pérdida de interés en actividades que resultaban placenteras, el cansancio

La depresión en el anciano se está convirtiendo en un importante problema de salud pública. Caracterizada por una mayor gravedad, un elevado riesgo de suicidio y dificultades a la hora de identificarla, es una enfermedad que, con todo, puede y debe ser tratada. En el presente artículo se revisan la clínica y el tratamiento farmacológico de la depresión en el anciano.

V. MÉTODOS Y METODOLOGÍA

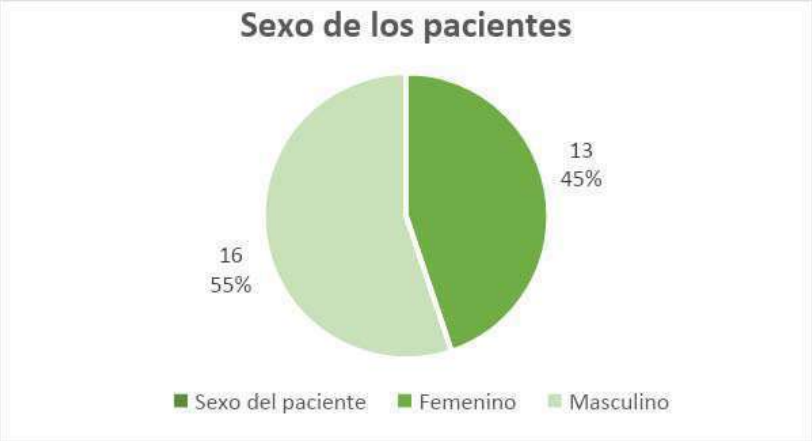
Se pretende trabajar con pacientes geriátricos que abarcan de 45-90 años que a su vez se dividen en Preseniles 45-60 años, Senectud gradual 60-70 años, Vejez declarada 70-90 años, longevos más de 90 años, que son los pacientes que se encuentran en el albergue del asilo de ancianos Casa hogar la Paz, para determinar el estado de depresión se aplico la escala de Yesavage es un instrumento que muestra cómo perciben su estado de ánimo, posterior a esto se sacarán los datos sociodemográficos, vaciado e interpretación de las pruebas, análisis descriptivo de los resultados.

Consideraciones éticas: La investigación se consideró “sin riesgo” de acuerdo con el Reglamento de la Ley General de Salud en Materia de Investigación en Salud 25, vigente al momento del estudio, pues no se realizaron intervenciones sobre las variables fisiológicas ni psicológicas de los participantes, ni se recopiló información sensible, por lo que la participación de los sujetos no estuvo sujeta a la obtención de su consentimiento informado por escrito.

VI. RESULTADOS

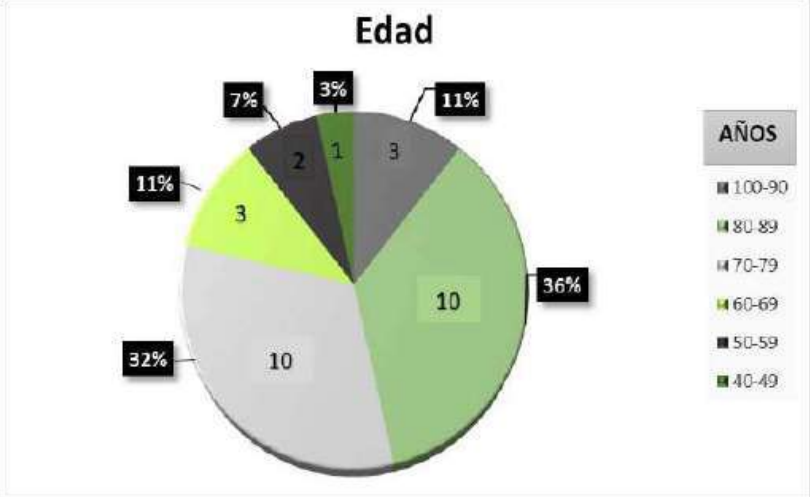
Sexo

De los pacientes evaluados hay una mayor prevalencia de hombres con un 55% en comparación con el 32% de mujeres en la casa hogar La Paz.



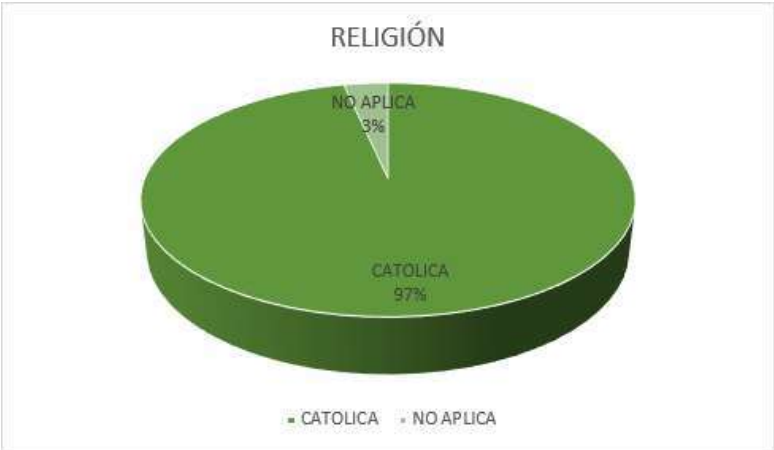
Edad

En relación a la edad de los pacientes, se logra interpretar que existe mayor población en cuanto a edad en el grupo de 80 a 89 años teniendo 10 pacientes en este grupo de edad , continuando con el grupo de 70 a 79 años contando con 9 pacientes en este rango , seguido del grupo de 99 a 100 y de 60 a 69 años donde se obtiene 3 pacientes en cada rango de edad , consecutivo del grupo de edad de 50 a 59 teniendo dos pacientes en esta categoría y terminado con el grupo de 40 a 49 donde solo se cuenta con una persona en esta clase.



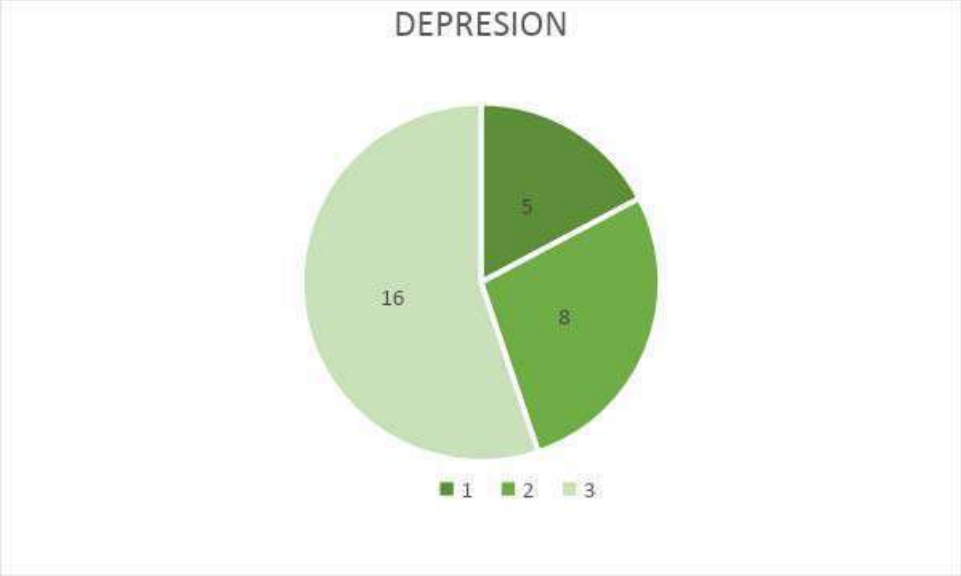
Religión

En cuanto a la religión a la que pertenecen los adultos mayores, el 97% de ellos (28) son católicos.



Derechohabiencia

En cuanto a la derechohabiencia se observa que el 31% de los residentes del centro gerontológico permanente no cuentan con esta, un 24% son derechohabientes del sector salud, un 4% pertenecen a Pemex y 41% pertenece como derechohabiente IMSS.



Depresión

Se encontró que de los 29 personas evaluadas un 55.17% no se encuentran deprimidos, contrastando con un 27.58% que si se encuentran deprimidos y un 17.24% no respondió al cuestionario.

Conclusiones

Dentro de la población que se encontró más incidencia de depresión es en mujeres es de 4 que representa el 13.79% de la población a diferencia de 2 hombres que representan el 6.89% de la población.

La depresión es muy frecuente en el adulto mayor y va depender de los factores sociodemograficos que influyen en la calidad de vida inclusive a predominar la ideación suicida. Es importante que el personal de Salud que esta a cargo reconozca las señales de alarma para poder detectarlas.

La comunidad, los gobiernos y las instituciones internacionales deben tomar acciones para contrarrestar los factores de riesgo modificables y poner en práctica políticas sociales y de salud para mejorar la calidad de vida de los adultos mayores.

BIBLIOGRAFÍA

1. Allevato, Miguel Ángel, Gaviria, John, (2008). Envejecimiento, Educación Continua, 154-162, (Citado 22 Mar 2017), de http://www. atdermae. com/pdfs/atd_31_03_02.pdf
2. Balanza Galindo, Serafín, Morales Moreno, Isabel, & Guerrero Muñoz, Joaquín. (2009). Prevalencia de Ansiedad y Depresión en una Población de Estudiantes Universitarios: Factores Académicos y Sociofamiliares Asociados. *Clínica y Salud*, *20*(2), 177-187. Recuperado en 07 de septiembre de 2023, de http://scielo.isciii.es/scielo.php?script=sci_arttext&pid=S1130-52742009000200006&lng=es&tlng=es.
3. Carranza Esteban, Renzo Felipe DEPRESIÓN Y CARACTERÍSTICAS DEMOGRÁFICAS ASOCIADOS EN ESTUDIANTES Y LÍDERES UNIVERSITARIOS DE LIMA METROPOLITANA Apuntes Universitarios. Revista de Investigación, núm. 2, julio-noviembre, 2012, pp. 79-90 Universidad Peruana Unión San Martin, Perú.
4. Gómez, C., Bohórquez, A., Pinto, D., Gil, J., Rondón, M., y Díaz, N. (2004). Prevalencia de depresión y factores asociados con ella en la población colombiana. Revista Panamericana de Salud Pública, 16(6), 378-386.

5. National Institute of Mental Health. (2002). Depresión. Recuperado de http://www. nimh. nih. gov/publicat/spDep3561.cfm.
6. Navarro Elías María de Guadalupe, et. Al. Cuidado de Enfermería y la Calidad de Vida en el Adulto Mayor, Universidad de Guanajuato, Universidad Nacional de Trujillo-Perú, ALTARES COSTA-AMIC Editores.
7. Novel Martí Gloria, (1991), Enfermería Psicosocial, Edit. Salvat, Barcelona España, pág. 5.
8. Lugo-Galera Carlos, Huerta-Sobrino Cristina y Yfarraguerri-Villarreal Lucía, La Globalización Económica y su impacto en el Mercado Laboral en México, [International Journal of Good Conscience] 2014 Ags [citado 2021 Nov 02] 9(2)69-89.
9. OMS 2015, Informe mundial del envejecimiento y la salud. Descargado el 01 de Junio de 2016. Disponible en http://apps. who.int/iris/bitstream/10665/186466/1/9789 240694873_spa.pdf?ua=1 .
10. Pereyra, M. y Mussi, C. (2005). Sea Feliz, ¿cómo vencer la depresión y controlar la ansiedad?. Montemorelos, Nuevo León: Ed. Montemorelos México.

REFERENCIAS BIBLIOGRÁFICAS

1. Alfaro-Lefevre, R. (2003). Aplicación del proceso enfermero. Fomentar el cuidado en colaboración. 5ª ed. Barcelona, Masson.
2. Bergland A, Kirkevold M. Thriving in nursing homes in Norway: Contributing aspects described by residents. International Journal of Nursing Studies 2006;43(6):681-91.
3. Bulechek, G. M., Butcher, & Dochterman, J. M. (2009). Clasificación de Intervenciones de Enfermería (NIC). 5ª ed. Barcelona, Elsevier.
4. Burke Mary M, Walsh Mary B. 1998. Enfermería Gerontológica, Cuidados integrales del adulto mayor, Edit Elsevier Mosby, Segunda Edición, Madrid, España, pág. 602.
5. Castillo, M. (2009). Envejecimiento exitoso. En Medica Clínica Condes, 20 (2), 167-174. Recuperado de www.clc. cl/Dev_CLC/media/ Imagenes/PDF%20revista%20m%C3%A9dica a/2009/2%20marzo/04ENVEJECIMIENTO--4.pdf
6. Colliere MF. Encontrar el sentido original de los cuidados enfermeros. [revista en la Internet]. 1999; [Citado 2021];22(1): 27-31. Disponible en: https://dialnet. unirioja.es/ servlet/articulo?codigo=3558272.
7. Fassio Adriana, Rutty María Gabriela, Ortíz-Rojas Yenny Patricia, Aijenbon Gisela. Innovación Social, Politicas Públicas y Aprendizaje Organizacional: El Programa Nacional de Cuidados Domiciliarios [revista en la Internet]. 2015 Jul [Citado 2021 Nov 02]; 7(13): 9-24. Disponible en: http:// itmojs.itm.edu.co/index.php/trilogia/article/v iew/810/765.
8. Frenk Julio, Gómez-Dantés Octavio. La globalización y la nueva salud pública. Salud pública Méx [revista en la Internet]. 2007 Abr [citado 2021 Nov 02]; 49(2): 156-164. Disponible en: http://www.scielo.org.mx/ scielo.php?script=sci_arttext&pid=S0036-36 342007000200011&lng=es.
9. Gómez Bedoya Maria, (2008). El Aprendizaje en la tercera edad. Una aproximación en la clase de Ele: Los aprendientes mayores japoneses en el Instituto Cervantes de Tokio.
10. Hazzard W R. Biología del envejecimiento. Kelley Medicina Interna. Segunda edición, Tomo II. Editorial Panamericana 1996, páginas 504-9.
11. Hernández Triana, Manuel, 2014. Envejecimiento. Revista Cubana de Salud Pública, Citado 23 de Junio de 2021. Disponible en: http://www.redalyc.org/articulo.oa?id=21432 546011.
12. Y Práctica. Ed. Mc Graw Hill. 4ta edición. España, pp. 39-58.
13. Hidalgo-Pedraza L, Blanca-Gutiérrez J J, Jiménez-Díaz M d C, Grande-Gascón M L, Linares-Abad M, Relación del cuidado que demandan las personas mayores en hogares para ancianos: metaestudio cualitativo. Aquichan 201212213-227. Disponible en: http://www.redalyc.org/articulo.oa?id=74124 948002. Citado 5 de noviembre de 2021.
14. Instituto Nacional de Geriatría. Hechos y desafíos para un envejecimiento saludable en México. 2016. México Disponible en: http:// www.geriatria.salud.gob.mx/descargas/notici as/HECHOS.pdf Citado el 07 del 10 del 2021.

15. Instituto de la U N E S CO para la Educación, 1999. Fecha de Consulta 24 de Julio de 2021.
16. Lyder CH, Preston J, Grady JN, Scinto J, Allman R, Bergstrom N, Rodeheaver G. Quality of care for hospitalized medicare patients at risk for pressure ulcers. Arch Intern Med. 2001;161(12):1549-54
17. Madrigal-Martínez, Mariana. (2010). Ingresos y bienes en la vejez, un acercamiento a la configuración de la seguridad económica de los adultos mayores mexiquenses. *Papeles de población*, *16*(63), 117-153. Citado el 23 de abril de 2021, de http://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S1405-74252010000100005&lng=es&tlng=es.
18. Mogollón E. (2012). Una perspectiva integral del adulto mayor en el contexto de la educación. Revista Interamericana de Educación en el Adulto Mayor. 34(1), 57-74. Citado el 01 de Junio de 2021 Disponible en: http://www.redalyc.org/pdf/4575/457545090005.pdf
19. Moreno-Fergusson M E, La globalización y el conocimiento de enfermería. Aquichan 2009 9210-211. Disponible en: http://www. redalyc. org/articulo.oa?id=74112147001. Citado: 5 de noviembre de 2021.
20. Navarro Elías María de Guadalupe, et. Al. 2014. Cuidado de Enfermería y la Calidad de Vida en el Adulto Mayor, Universidad de Guanajuato, Universidad Nacional de Trujillo-Perú, ALTARES COSTA-AMIC Editores.
21. Novel Marti Gloria, (1991), Enfermería Psicosocial, edit. Salvat, Barcelona España, pag 5.
22. OMS 2015, Informe mundial del envejecimiento y la salud. Citado el 01 de Junio de 2021. Disponible en http://apps.who.int/iris/bitstream/10665/186466/1/9789240694873_spa.pdf?ua=1.
23. Osorio Adriana y Dr. Alejandro Álvarez Mora.- Introducción a la Salud Familiar/editado por 1 ed. - San José, Costa Rica, 2004. Citado el día 26 de agosto de 2021.
24. Ramírez, Liberio Victorino; Víctor Ramírez, Ana Cecilia; (2010). Educación para adultos en el siglo XXI: análisis del modelo de educación para la vida y el trabajo en México ¿avances o retrocesos?. Tiempo de Educar, Enero-Junio, 59-78. Disponible en: http://www.redalyc.org/articulo.oa?id=31116163004 Citado el 27 de Julio de 2021.
25. Sociedad Española de Enfermería Geriátrica y Gerontológica, Temas de Enfermería Gerontológica, Editado por la sociedad española de geriatría y gerontología, 1999.
26. Salgado-de Snyder V. Nelly, Wong Rebeca. Género y pobreza: determinantes de la salud en la vejez. Salud pública Méx [revista en la Internet]. 2007 Ene [citado 2021 Nov 21]; 49(Suppl 4): s515-s521. Disponible en: http://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S0036-36342007001000011&lng=es

This page is intentionally left blank

Some Thoughts Regarding the Narrative of the Current Nosological Schema and their Ramifications for Major Mental Disorders with a Focus on Schizophrenia

Nicholas Pediaditakis, MD, DLFAPA

ABSTRACT

The current nosological schema for major mental disorders does not capture all the clinical phenomena, especially those being observed longitudinally (i.e., six decades of clinical observations of over eight thousand patients suffering with emotional problems of which three thousands of them suffer from major mental disorders, spanning two to three generations by the author). The objective of this article is to point out that these overlooked in their collective significance phenomena—even though they are noted by the clini-cians, are not part of the categorical guidelines of the current schema. They have ramifications for better conceptualizing the road-guide in our future research for these baffling, major mental disorders, including schizophrenia, bipolar affective disorder, obsessive-compulsive disorder (OCD), anxiety, and attention deficit hyperactivity disorder (ADHD), which are sharing a common, neuro-developmental origin.

Keywords: major mental disorders, schizo-phrenia, neurology, psychopathology.

Classification: NLMC Code: WM 140

Language: English

London Journal of Medical and Health Research

Volume 23 | Issue 11 | Compilation 1.0

Some Thoughts Regarding the Narrative of the Current Nosological Schema and their Ramifications for Major Mental Disorders with a Focus on Schizophrenia

Nicholas Pediaditakis, MD, DLFAPA

ABSTRACT

The current nosological schema for major mental disorders does not capture all the clinical phenomena, especially those being observed longitudinally (i.e., six decades of clinical observations of over eight thousand patients suffering with emotional problems of which three thousands of them suffer from major mental disorders, spanning two to three generations by the author). The objective of this article is to point out that these overlooked in their collective significance phenomena—even though they are noted by the clini- cians, are not part of the categorical guidelines of the current schema. They have ramifications for better conceptualizing the road-guide in our future research for these baffling, major mental disorders, including schizophrenia, bipolar affective disorder, obsessive-compulsive disorder (OCD), anxiety, and attention deficit hyperactivity disorder (ADHD), which are sharing a common, neuro-developmental origin.

Keywords: major mental disorders, schizophrenia, neurology, psychopathology.

Author: Department of Psychiatric Medicine, ECU Brody School of Medicine, Greenville, NC, USA.

I. INTRODUCTION

There exists a need for a better narrative for the current categorical guidelines of the major mental disorders (i.e., schizophrenia, anxieties, bipolar affective and obsessive-compulsive disorders). Considering such a narrative encompassing clinical phenomena shared by all the major mental disorders will be a more fruitful guide for delineating the mechanisms of their psychopathology. This outline is a review on the topic based at length in a previously, published article titled “An Emerging Natural History in the Development, Mechanisms and Worldwide Prevalence of Major Mental Disorders” [1].

II. SUBJECTS AND METHOD

The clinical phenomena of schizophrenia shared by the rest of the other major mental disorders apparent in longitudinal observations at present are over the horizon of our scrutiny. They include the following; first, the longitudinal ob- servations of the same individual patients show frequent shifts from one condi- tion to another. Thus, bipolar affective disorder shifts to obsessive-compulsive disorder, and schizophrenia to severe anxiety. Diagnosing these phenomena as co-morbidities mask the fact that it is the same disease with its frequent shift in its syndrome.

Second, the group gene loci associated with schizophrenia and the other four conditions (i.e., attention-deficit/hyperactivity disorder (ADHD), bipolar affective disorder, obsessive-compulsive disorder (OCD), and incapacitating anxiety) [2] certainly code for the premorbid personalities of the mentioned major mental disorders and not the expression of the disorders themselves, since, the former invariably antedates the latter [3]. Focusing on schizophrenia, each of the variant syndromes of the disorder occurs probabilistically on some “at-risk” individuals whose pre-existing extreme, temperamental variance confers vulnerability for the expression of the disorder. Even the recently found group of genes directly responsible for schizophrenia are actually coding

for extreme temperamental lopsidedness, thus, conferring vulnerability in the individuals with such temperament for developing the disorder.

The extreme premorbid personality (*a.k.a.*, temperament, idiosyncrasy, physis, personality traits, and character) is invariably present in schizophrenia as well in the remaining aforementioned disorders. Temperament in its normal form is made up of components or traits whose origins, according to E.O. Wilson [4], emanate from two evolutionary pressures. First is the one that results on an individual, such as an "inner-directed," autonomous one who feels comfortable in being alone, self-autonomous and with a paucity of social interactions (e.g., alienation) with those previously mentioned traits. Again normally, albeit, not in the pronounced extreme form as in the case of major mental disorders such as schizophrenia. Second is the pressure that results from the social experience in being human, such as empathy, altruism, cooperativeness, eagerness for social interactions, and group identity. Together, they coexist side-by-side and comprise human nature but, in an unamalgamated mix, and they may result in an uneasy, conflictual existence for oneself and others [5].

All these traits again normally emanating from the two evolutionary pressures mentioned above are occurring in a different recipe allocation of their traits for each individual, thus making up the infinite variability of temperamental traits. Evolutionarily, they confer flexibility and robustness for our human tribe. In the case of schizophrenias, on account of the extreme lopsided temperament emanating mainly from the evolutionary pressures on the individual, the variable symptoms that define the disorder should be considered as a clinical expression of a phase shift, which is a switch to the pathologically, ordered phase of the overall operating mode of brain function. This mode is based on an emergent quality of complexity, which normally ensures the synchrony, coordination, subtlety, and flexibility in the expression of the components of the various higher brain faculties. When this shift affects mood modulation, it results in bipolar disorder. When it affects thought processes, and alignment of thoughts with feelings, an appropriateness of behavior with the demands made by the environment it results in schizophrenia. When it affects an algorithmic faculty of scheduling and foreplanning, it results in obsessive-compulsive disorder, and when it affects the appropriate responses to the external world, it may result in odd behavior.

The initial expression of the periodic epiphenomena comprising the major mental disorders superimposed on the pre-existing, "lopsided," temperament, (*i.e.*, a premorbid trait) should be considered–at least in the beginning–similar to atrial fibrillation. Both atrial fibrillation and the initial clinical phenomenon of schizophrenia signifying the phase shift of coordination and synchrony both recover by application of electroshock, at least temporarily.

Fifth, these symptoms are made of antithetical substitutes of an either/or nature; thus, apathy alternates with an explosive outburst, and the appearance of ambivalence (*i.e.*, rapid shifting attitude and feelings for the same person or object) and frantic activity being replaced by lassitude. These phenomena are not captured by the terms used by the current schema of negative symptoms. Specifically, the term negative symptoms which are an awkward neologism that obscures rather than elucidate the phenomena at hand, preventing us to notice their collective significance as being the result of a phase shift of the overall normal mode of synchrony.

Frequently, schizophrenia's phenomena overlap with those of the four, major mental disorders, while often even alternating with each other [6] [7]. In a parallax view of the current nosological schema, the symptoms of schizophrenia can be divided into three parts; the traditional Bleuler's four A's; disordered thinking (association), emotional flatness (apathy) alternating with explosive bouts, the presence of autism or "preoccupation with oneself" and finally, ambivalence (i.e., the coexistence of contradictory sentiments or attitudes towards a subject) and additionally, inappropriate behavior in one's environment. Often, pre-existing aloofness or apathy is felt by the individual himself, as an inner

void conducive to a malignant boredom, a "dread beyond telling", and disconnectedness from their fellow humans, even though it does not preclude having social skills facilitating interactions and masking their felt alienation. Nevertheless, patients will readily confirm such feelings when asked. It's important to note that the occurrence of concomitant occurrence of psychotic phenomena are similar to the ones that occur in other assaults on brain function, such as, trauma, toxicity, or high fever with the sole exception the delusions are more in their contend "narcissistic." Finally, constituting the third part of the disorder is the underlying, extreme temperamental traits previously mentioned which remain the same in remissions. Thus, the presence of psychosis is currently erroneously assigned in its pathognomonic significance.

Significantly, the 1% worldwide prevalence of schizophrenia—irrespective of culture, persists in spite of the evolutionary pressure for its extinction. Since the condition appears early, the patients die earlier, and they have low fertility [7] [8] [9]. Such persistence can be explained evolutionarily as a trade-off between the extreme lopsided temperament that confers vulnerability to schizophrenia, on the one hand, and the advantageous creative ability conferred by this very extreme temperament, on the other [10]. The Aristotelian adage that "there is no genius without a touch of madness" is correct. Indeed, the presence of an extreme temperamental type in patients acts as an enabling factor in expressing creativity. It liberates these individuals from the constraints of social algorithms. Now, the individual is able to think in alternatives, to discern novel patterns in science, to create emotionally stirring pieces of art and music. Others of this type even become notable social leaders and politicians who recruit obedience and loyalty of the masses [11]. Not all geniuses become schizophrenic, and not all patients who have a "lopsided" temperament become geniuses. For that, they need intellect, curiosity, and persistence of effort. It is important to note that the above points are applied similarly to OCD, bipolar affective disorder, and severe anxieties [12].

III. RESULTS AND CONCLUSIONS

In taking into consideration the postulates presented above can act as facilitating guides in research for delineating the baffling major mental disorders [13]. To recapitulate: first, the clinical manifestations of schizophrenia constitute periodic epiphenomena on a pre-existing, extreme temperamental variance at least in the beginning.

Second, in addition, such clinical manifestations are the results of the phase shift of the overall operating mode of brain function—again overlooked in its significance which normally confers elegance, subtlety, ability to accommodate ambiguity shifting to a mode of an either/or pathological expression of symptoms made up of antithetical substitutes such as ambivalence, apathy alternating with explosive emotional outbursts, and gross inappropriate responses to environmental demands. They are readily recovered to the normal mode temporarily with the application of electroshock. The third manifestation made up of the psychotic phenomenon is comprised of delusions, and hallucinations which are similar to those expressed in any assault on brain function, such as brain trauma, high fever, and toxicity and yet, currently, a psychosis is assigned erroneously in its pathomemnonic significance.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

REFERENCES

1. Pediaditakis, N. (2016) An Emerging Natural History in the Development, Me- chanisms and Worldwide Prevalence of Major Mental Disorders. *Open Neurology Journal*, 10, 149-154. https://doi.org/10.2174/1874205X01610010149.
2. Lee, S.H., Ripke, S., Neale, B.M., *et al.* (2013) Identification of Risk Loci with Shared Effects on Five Major Psychiatric Disorders: A Genome-Wide Analysis. *Lancet*, 38, 1371-1379. https://doi.org/10.1016/S0140-6736(12)62129-1
3. Pediaditakis, N. (2012) Origins and Mechanisms in the Development of Major

Mental Disorders: A Clinical Approach. *Journal of Behavioral Brain Science*, 2, 269-275. https://doi.org/10.4236/jbbs.2012.22030.
4. Wilson, E. O. (2012) The Social Conquest of Earth. Liveright Pub Corp., NY.
5. Nowak, M. A., Wilson, E. O. and Tarnita, N. A. (2010) The Evolution of Eusociality. *Nature*, 466, 1057-1062. https://doi.org/10.1038/nature09205
6. Freeman, M. P., Freeman, S. A. and Mc Elroy, S.L. (2002) The Comorbidity of Bipolar and Anxiety Disorders: Prevalence, Psychobiology and Treatment Issues. *Journal of Affective Disorders*, 68, 1-23. https://doi.org/10.1016/S0165-0327(00)00299-8.
7. Leboyer, M., Henry, C., Paillere-Martinot, M.L. and Bellivier, F. (2005) Age at Onset in Bipolar Affective Disorders: A Review. *Bipolar Disorder*, 7, 111-118. https://doi.org/10.1111/j.1399-5618.2005.00181.x.
8. Collingwood, J. (2018) Premature Death Rates Rising in Schizophrenia, Bipolar. *Psychcentral*. https://psychcentral.com/lib/premature-death-rates-rising-in-schizophrenia-bipolar-patients.
9. Giudice, M.D. (2010) Reduced Fertility in Patients' Families Is Consistent with the Sexual Selection Model of Schizophrenia and Schizotypy. *Public Library of Science* (*PLoS ONE*), 5, e16040. https://doi.org/10.1371/journal.pone.0016040.
10. Andreasen, N.C. (1987) Creativity and Mental Illness Prevalence Rates in Writers and their First-Degree Relatives. *American Journal of Psychiatry*, 144, 1288-1292. https://doi.org/10.1176/ajp.144.10.1288.
11. Pediaditakis, N. (2014) The Association Between Mental Disorders and Geniuses. *Psychiatric Times*, 31, No. 9.
12. Pediaditakis, N. (1998) Shared Characteristics in the Clinical Expression and Pharmacological Responses of Mental Disorders and their Possible Collective Signific- ance. *Medical Hypotheses*, 50, 347-352. https://doi.org/10.1016/S0306-9877 (98) 90124-4.
13. Pediaditakis, N. (2016) Revisiting the Major Mental Disorders and Updating the Nosological Schema: A Synthesis. *Journal of Behavioral and Brain Science*, 6, 93-98. https://doi.org/10.4236/jbbs.2016.62010.

Medical Women's Mental Health Factors during the COVID-19 Pandemic

Andrii Trofimov & Miliutina Kateryna

Taras Shevchenko Kyiv National

ANNOTATION

The article is devoted to the study of the fear level of death in young nurses and senior students of medical school, and the role of tolerance to uncertainty in the development of fear of death.

A study of 150 respondents was carried out: 73 people are nurses and paramedics, 72 are medical school students, senior courses. Students underwent practical training in hospitals, but were not directly involved in work with patients with COVID-19. The following methods were chosen: "Fear of Death Scale" by J. Boyar, Templer's Death Anxiety Scale, method "Inclination to suicidal behavior" by T. N. Razuvaev. also the questionnaire" the Multiple Stimulus Types Ambiguity Tolerance Scale-II (MSTAT-II) by McLain in the adaptation of Osin. Women physicians who work directly in hospitals have a higher level of fear of death, but lower suicidal risks than students of medical specialties. Intolerance to uncertainty enhances individual manifestations of fear of death and suicidal risk.

Keywords: medical women, suicide, fear of death, tolerance, COVID-19.

Classification: NLMC Code: F03

Language: English

Great Britain Journals Press

LJP Copyright ID: 392824

London Journal of Medical and Health Research

Volume 23 | Issue 11 | Compilation 1.0

Medical Women's Mental Health Factors during the COVID-19 Pandemic

Andrii Trofimov[α] & Miliutina Kateryna[σ]

ANNOTATION

The article is devoted to the study of the fear level of death in young nurses and senior students of medical school, and the role of tolerance to uncertainty in the development of fear of death.

A study of 150 respondents was carried out: 73 people are nurses and paramedics, 72 are medical school students, senior courses. Students underwent practical training in hospitals, but were not directly involved in work with patients with COVID-19. The following methods were chosen: "Fear of Death Scale" by J. Boyar, Templer's Death Anxiety Scale, method "Inclination to suicidal behavior" by T. N. Razuvaev. also the questionnaire " the Multiple Stimulus Types Ambiguity Tolerance Scale-II (MSTAT-II) by McLain in the adaptation of Osin. Women physicians who work directly in hospitals have a higher level of fear of death, but lower suicidal risks than students of medical specialties. Intolerance to uncertainty enhances individual manifestations of fear of death and suicidal risk.

Keywords: medical women, suicide, fear of death, tolerance, COVID-19.

Author α: PhD in Psychology, Associate Professor Department of Psychology, Taras Shevchenko Kyiv National University.
σ: Doctor of Psychology, Professor Department of Psychology, Taras Shevchenko Kyiv National University.

Formulation of the Problem: Throughout 2020, due to the COVID-19 pandemic, the workload on medical personnel has increased dramatically. More than any other group, doctors have been infected with COVID-19, work overtime, experience stress and overwork. In this regard, the study of the fear of death and those personal factors that enhance it is of particular importance precisely among medical personnel.

Purpose: To study the level of fear of death in young nurses and senior students of medical school, and the role of uncertainty tolerance in the development of fear of death.

Analysis of Previous Studie: Research on suicidal risks in young people and adolescents has been actively carried out in recent years. Carlos M. Coelho, Panrapee Suttiwan, (2020) in the process of meta-analysis of 28 relevant articles, divided the articles into six groups depending on their content and meaning: fear of the unknown, social isolation, hypochondria, disgust, fears associated with information, and compliance. Given the nature of fear and anxiety, coupled with the characteristics of the current COVID-19 situation, the authors suggested that doctors and other healthcare professionals from multiple specialties, as well as police, firefighters, rescuers, and rapid-response services, might be better able to deal with COVID-19, if they have (a) some tolerance for the unknown, (b) anxiety disorder with a low incidence of illness, (c) tolerance for social isolation; (d) a low level of sensitivity to disgust; (e) the ability to receive financial support, (f) be prioritized when medical attention is needed, (g) exercise caution in media coverage of COVID-19, and (h) be trained to achieve a high level of effectiveness. It also discusses the possibilities of preventive and therapeutic interventions that can help both the medical staff and the general population.

However, the problems of anxiety and suicidal risk of doctors have arisen not only in connection with the pandemic. Christine R. Stehman, Zachary Testo, Rachel S. Gershaw, and Adam R. Kellogg (2019) emphasize that more than 400 doctors die each year, probably due to increasing

depression and emotional burnout. More systemic causes were identified that did not depend on individual doctors. Such systemic reasons include limitations on electronic health records, long working hours and significant education arrears, all in a "no-mistake" culture. Blame and isolation in the face of medical errors and poor outcomes can lead to emotional trauma to the doctor, the so-called "second victim" syndrome, which is both a cause and a consequence of burnout. In addition, emergency physicians (EPs) are also particularly affected by the intensity of clinical practice, a higher risk of litigation, and chronic fatigue due to disturbed circadian rhythm. Burnt-out doctors (from the point of view of these authors) are unlikely to seek professional treatment and to try to cope with substance abuse, depression and suicidal ideation.

In addition to external causes, internal ones can also influence suicidal risks. So, for example, in the study by Nicole S. Smith, Rachel L. Martin Brian, W. Bauer Shelby, L. Bandel Daniel, W. Capron (2020) the authors draw attention to the fact that the risk factors for suicide are panic, fear of death and sleep disturbances. Nocturnal panic attacks that occur outside of sleep represent an intersection of these risk factors. Nowadays, only one study examines this relationship, but consider suicidality as a single construct. The authors found that nighttime panic would be associated with more suicidal thoughts, plans, and attempts in history than daytime fear of death. Participants recruited from a sample of the online community were rigorously screened for a history of fear attacks and panic attacks during the night and day, and completed questionnaires about past suicidal ideation, plans and attempts.

The study of the actual state of medical personnel during the pandemic began in China, against the background of the first wave of coronavirus infection. Haozheng Cai, Baoren Tu, Jing Ma, Limin Chen, Lei Fu, Yongfang Jiang, Quan Zhuang (2020) conducted a study during the recent epidemic in Hubei province. Across China, medical personnel at the forefront were responsible for contact tracing of patients infected with coronavirus disease 2019 (COVID-19). This study was focused on the psychological impact and coping strategies of frontline medical personnel in Hunan Province, adjacent to Hubei Province. The crossover observational study involved doctors, nurses and other hospital staff across Hunan province between January and March 2020. The research questionnaire consisted of five sections and 67 questions (0-3 points). The questionnaires were completed by 534 nursing staff. The responses indicated that they felt they had a social and professional responsibility to continue working overtime. Medical staff worried about their safety and the safety of their families and reported the psychological impact of reported deaths from COVID-19 infection. Having strong infection control guidelines, specialized equipment, hospital and government recognition of their efforts, and reduced reported cases of COVID - 19 improved staff health.

The COVID - 19 outbreak in Hubei has caused increased stress for medical personnel in neighboring Hunan province. The continued recognition of medical personnel by hospital management and government, the provision of infection control guidelines, special equipment and supplies to combat COVID-19 infection should be recognized as factors that can motivate medical personnel to work during future epidemics. A study of pediatric staff working in China was done by Yun Chen,a Hao Zhou,a,b, Yan Zhou,b and Fang Zhoua (2020). The data was collected using an anonymous self-assessment questionnaire. The questionnaire consisted of three parts: basic demographic data, the self-reported depression scale (SDS) and the self-reported anxiety scale (SAS). Subjects who have worked in high-risk areas such as COVID-19 wards, infectious disease wards, emergency departments, pulmonary medicine wards, or X-ray laboratories have been classified as high-risk workers.

105 questionnaires were collected, the average age of the respondents was 32.6 ± 6.5 years. Gender, age, marriage, years of employment, occupation, educational level, and economic income of primary health care workers did not influence anxiety and depression. No significant differences were found in the incidence of anxiety or

depression between respondents with experience with COVID-19 patients and those who did not. In addition, there was no statistically significant difference in the severity of psychiatric symptoms based on work experience. However, respondents with work experience reported higher rates of anxiety accompanied by depression than respondents without such experience (frequency of occurrence 31.6% and 12.6%, respectively; $\chi 2 = 4,1$, $P = 0,042$). The authors note that during the COVID-19 outbreak, the prevalence of self-reported depression and anxiety among pediatric healthcare workers was significantly higher.

Similar studies were carried out in Europe, for example in Poland. Cross-sectional study was conducted nationwide from March 16 to April 26, 2020 in Poland. A total of 2,039 respondents from all health care providers (59.8%) as well as other professionals completed the socio-demographic section, the General Health Questionnaire and the author's exposure-related questionnaire about SARS-CoV. An infection, the presence of protective measures, quarantine, changes in the work schedule and place of work during a pandemic, as well as feelings associated with the state of the pandemic were studies. It was found that healthcare workers were more likely to present corresponding psychopathological symptoms (overall score GHQ-28 (General Questionnaire-28)> 24) than the non-medical group (60.8% versus 48.0%, respectively), such as anxiety, insomnia, and somatic disorders. Male gender and old age were associated with significantly lower overall GHQ-28 scores among healthcare professionals, while among non-medical professionals, male gender was associated with significantly lower overall GHQ-28 scores. Somatic and anxiety symptoms and insomnia are more common among healthcare workers than among workers in other occupations. Ukrainian scientists Ivan Danyliuk (2020) with co-authors, within the framework of an international project, investigated the impact of quarantine and COVID-19 on the psycho-emotional state of Ukrainian citizens.

But the features of the psycho-emotional state of medical personnel have not been sufficiently studied.

II. RESEARCH STRUCTURE AND METHODS

A study of 150 respondents was carried out: 73 people were nurses and paramedics, 72 were students of a medical school, senior courses. Students did internships in hospitals, but were not directly involved in work with patients with COVID-19.

To study the experience of the fear of death, the following methods were chosen: "Fear of Death Scale" by J. Boyar, Templer's Death Anxiety Scale, method "Inclination to suicidal behavior" by T. N. Razuvaev. also the questionnaire " the Multiple Stimulus Types Ambiguity Tolerance Scale-II (MSTAT-II) by McLain in the adaptation of Osin. D. McLaine's method of tolerance to the unknown is a questionnaire that measures the tendency of a person to severely regulate one's own life, determining the desire to know all the conditions of the external environment, as well as the desire to control these conditions. The second version of the adaptation of E.N. Osin's methodology, version of 2004, was selected for the study. The author of the questionnaire defines tolerance to the unknown as a wider range of specifically directed reactions of the individual (from the attractiveness of this spectrum to its complete ignorance) to incentives that one perceives as unknown, complex, changeable, or making it possible to find several fundamentally different interpretations.

In the original questionnaire by D. McLaine, there are twenty-two statements, the agreement with which the respondents are asked to assess on a seven-point Likert scale. The adaptation by E. N. Osin also contains twenty-two statements, but items number three, twenty and twenty-one were excluded from the scale "Attitude to novelty", since they turned out to be statistically insignificant. Also, in addition to the general indicator that is obtained when calculating raw scores, indicators of five subscales are subtracted, concerning two blocks: openness to the unknown or leaving of unknown incentives, attitude to

novelty, attitude to complex tasks, as well as uncertain situations.

In terms of age, the largest number of respondents is from twenty to twenty-four years old. The lowest number of respondents is represented by young and older respondents: eighteen and thirty years old.

By gender, all respondents are women. The predominance of women in the sample is not accidental, it reflects the gender characteristics of the distribution of nursing staff in Ukraine.

A comparative study of the fear of death, anxiety, the level of tolerance to uncertainty was carried out in two groups: students and working doctors. The results are reflected in the table 1.

Table 1: Comparison of Mean Values in two Groups of Medical Women using the Mana-Whitney Test

Scales		N	Average student values	Average values of medical workers	Significance of differences
№	Age	150	22,625	24, 247	Not found
1	Fear of death	150	7,02	11, 28	≤0,05
2	Death anxiety (general)	150	7,583	13,623	≤0,01
3	Cognitive-emotional	150	3,763	7, 295	≤0,01
4	Physical changes	150	0,694	2, 127	≤0,05
5	Time awareness	150	1,097	1,022	Not found
6	Pain and stress	150	2,027	4, 654	≤0,05
8	General tolerance for uncertainty	150	80,375	114,539	≤0,01
9	Novelty	150	12,472	19, 437	≤0,01
10	Complexity of the task	150	29,347	43, 112	≤0,01
11	Uncertainty of the situation	150	34,041	52,045	≤0,01

As can be seen from the table, both the fear of death and intolerance to uncertainty are significantly higher among working doctors. This may be due to the fact that professional activities associated with constant stress, and in the context of coronavirus and high mortality among patients, negatively affects the emotional state of nursing staff.

Considering the dynamics of suicidal tendencies among students and medical workers, the study was carried out using express diagnostics according to the method of T.N. Razuvaeva.

Table 2: Comparative Analysis of Suicidal Tendencies among Doctors

Scales		N	Average Student Values	Average Values of Medical Workers	Significance of Differences
1	Demonstrativeness	150	6,02	5,63	Not found
2	Affectivity	150	5,545	3,125	≤0,05
3	Uniqueness	150	3,112	1,633	≤0,05
4	Insolvency	150	2,524	2,125	Not found
5	Social pessimism	150	1,887	3,458	≤0,05
6	Violation of cultural barriers	150	2,114	2,247	Not found
8	Maximalism	150	5,312	3,2	≤0,05
9	Time perspective	150	1,458	1,802	Not found
10	Anti-suicidal factor	150	2,314	4,311	≤0,05

The demonstrative subscale reveals the subject's desire to draw attention to oneself, as well as to the difficult situation in which one is. At the same time, there is a risk that, from an external position, demonstrative suicidal behavior may be viewed by others as an attempt to manipulate, although to a greater extent this behavior means a desire to help. The combination of demonstrative

suicidal behavior with emotional regency is dangerous, since it will be impossible to fully release and express one's own state in this way. Both students and working physicians have an average level of motivation, which is associated with their professional activities.

The subscale of affectivity reveals that the predominance and dominance of the emotional component over the intellectual control of the subject is quite high. A person will be more willing to demonstrate an emotional reaction to a traumatic situation. In this case, with the highest emotional arousal, an emotional blockade of intelligence may occur. This indicator is higher for students than for working doctors. This is connected both with work (which does not have excessive emotions) and with the age characteristics of the respondents.

The subscale of uniqueness reveals that the subject perceives oneself, one's existence, the situation in which one finds oneself as an exceptionally unique phenomenon, which in no case could arise in someone else. Accordingly, the exit can also be extremely unique, that is suicide. This egocentricity is closely related to the phenomenon of "impenetrability of experience", when a person cannot fully use the acquired samples of one's or someone else's experience when solving emotionally significant situations. Uniqueness is at a low level among students, and even lower among nurses. Working in medicine contributes to the understanding of one's non-unique nature and, due to this, somewhat reduces the suicidal risk.

The insolvency subscale reveals that the subject has a negatively colored conceptual idea of one's personality. This view is characterized by extremely negative descriptive features: the presentation of oneself as incapable of action, an incompetent employee or student, unnecessary either to society or the family. With high indices of this scale, the respondent experiences a severe "disconnection" from life. The subscale of insolvency expresses an intrapunitive radical, which testifies to the tendency of a person to ascribe blame under any circumstances to oneselve's account; this scale is at a low level both among students and doctors. Objective characteristics of success and rational thinking act as prevention of suicide in doctors.

The subscale of social pessimism reveals to the negative concept of not the personality, but the surrounding world as a whole. At high rates of this scale, the subject perceives the world as a hostile environment, and therefore relations with a person cannot be normal or be at a satisfactory level. In turn, social pessimism is closely related to the extrapunitive mechanism of casual attribution. A society will be considered as the primary source of problems of a social nature, which for some reason will not deserve the attention of the subject, which is expressed by doctors and reliably lower by students.

The subscale "violation of cultural barriers" reveals the study of the aspect of cultural and social influence on the perception and attitude of the student towards suicide as a concept. Not only the idea of suicide was studied, but also how attractive this phenomenon is for the respondent. When in the result indicators of the subject there are no other pronounced "peaks" according to the presented subscales, this indicates the presence of the concept of "existence of death". These manifestations are not typical for all of our respondents.

The subscale of maximalism reveals the presence of a certain infantile attitudes in the subject, which become part of one's value-semantic sphere of personality. It means that the generalization of a certain local conflict is possible, which concerns only a specific sphere of the life of an individual in one's life as a whole, as well as the impossibility of compensating for this process. There is an affective fixation on failures, that is characteristic of students and it may be associated with their age and insufficient life experience.

The subscale of the time perspective reveals that, with high rates in this scale, the subject shows the impossibility of constructive planning for the near and distant future. The respondents of both our samples can easily navigate in time.

The anti-suicidal factor subscale reveals a mechanism that neutralizes the high peaks of

other subscales, and therefore significantly reduces suicidal risk. The semantic meaning of this scale is values, significant situations, social groups and people. Particularly strongly influenced by the feeling of self-responsibility regarding the fact that the subject is able to influence certain aspects, as well as the basic religious ideas about the taboo of suicide as a phenomenon. Working physicians have significantly higher indicators on this scale.

In the study of the relationship between intolerance to uncertainty and fear of death, the following relationships were revealed and reflected in the table 3.

Table 3: Impact of Intolerance to Uncertainty on the Fear of Death in Physicians

Indicators	Coefficient Rs	Credibility
Fear of death	0,453	≤ 0,05
Death anxiety (general)	0,582	≤ 0,01
Cognitive-emotional anxiety	0,521	≤ 0,01
Affectivity	0,327	≤ 0,05
Uniqueness	0,358	≤ 0,05

It is noticeable that intolerance to uncertainty increases fear of death, anxiety, and at the same time, individual components of the propensity to suicide. It can be assumed that an increase in awareness, stock of knowledge about coronavirus, vaccination and the rules of behavior of medical personnel can significantly reduce both the fear of death and suicidal risks among female medical personnel.

III. CONCLUSION

Women physicians who work directly in hospitals have a higher level of fear of death (which is associated with both the danger to their lives and the risk of infection of family members), but lower suicidal risks than students of medical specialties. Intolerance to uncertainty enhances individual manifestations of fear of death and suicidal risk in women.

Future Research Perspective: Influence of Gender, Work Organization and Position in Health Care Institutions on Fear of Death in Staff.

LITERATURE

1. Carlos M. Coelho, Panrapee Suttiwan, Nikolett Arato and Andras N. Zsido (2020) On the Nature of Fear and Anxiety Triggered by COVID-19// REVIEW ARTICLE, Front. Psychol., 09 November 2020. https://doi.org/10.3389/fpsyg.2020.581314.
2. Christine R. Stehman, Zachary Testo, Rachel S. Gershaw, and Adam R. Kellogg (2019) Burnout, Drop Out, Suicide: Physician Loss in Emergency Medicine, Part I//West J Emerg Med. 2019 May; 20(3): 485–494. Published online 2019 Apr 23. DOI: 10.5811/westjem.2019.4.40970.
3. Nicole S.Smith, Rachel L.Martin, Brian W.Bauer, Shelby L.Bandel, Daniel W.Capron (2020) The association between nocturnal panic attacks and suicidal ideation, plans, and attempts// Psychiatry Research Volume 291, September 2020, 113280. DOI: 10.1016/j.psychres.2020.113280.
4. Haozheng Cai, Baoren Tu, Jing Ma, Limin Chen, Lei Fu, Yongfang Jiang, Quan Zhuang (2020) Psychological Impact and Coping Strategies of Frontline Medical Staff in Hunan Between January and March 2020 During the Outbreak of Coronavirus Disease 2019 (COVID 19) in Hubei, China// Med Sci Monit 2020; DOI: 10.12659/msm.924171.
5. Yun Chen,a Hao Zhou,a,b, Yan Zhou,b and Fang Zhoua (2020) Prevalence of self-reported depression and anxiety among pediatric medical staff members during the COVID-19 outbreak in Guiyang, China// Psychiatry Res. 2020 Jun; 288: 113005. Published online 2020 Apr 16. DOI: 10.1016/j.psychres.2020.113005.
6. Julian Maciaszek, Marta Ciulkowicz, Blazej Misiak, Dorota Szczesniak, Dorota Luc, Tomasz Wieczorek, Karolina Fila-Witecka,

Pawel Gawlowski, Joanna Rymaszewska (2020) Mental Health of Medical and Non-Medical Professionals during the Peak of the COVID-19 Pandemic: A Cross-Sectional Nationwide Study// Clin. Med. 2020, 9(8), 2527; https://doi.org/10.3390/jcm9082527.

This page is intentionally left blank

Narcolepsy: The Tip of an Iceberg of Neurological Dysfunction

Moshe Turner

ABSTRACT

Here, we demonstrate that a significant reduction in or total silencing of signaling by orexin neurons produces numerous systemic effects of which the symptoms of narcolepsy constitute only a small subset. We then suggest that this broad range of symptoms, having a single cause, be characterized, named, and entered into the taxonomy of diseases as a systemic neurological disorder. We opine that doing so would help to bring clinicians to a better awareness of the many physiological and behavioral manifestations of absent or significantly diminished orexinergic signaling, helping to improve the interactions they have with narcoleptic patients and the quality of the care they provide to them.

Keywords: narcolepsy, orexin.

Classification: NLMC Code: C10.228

Language: English

Great Britain Journals Press

LJP Copyright ID: 392825

London Journal of Medical and Health Research

Volume 23 | Issue 11 | Compilation 1.0

Narcolepsy: The Tip of an Iceberg of Neurological Dysfunction

Moshe Turner

ABSTRACT

Here, we demonstrate that a significant reduction in or total silencing of signaling by orexin neurons produces numerous systemic effects of which the symptoms of narcolepsy constitute only a small subset. We then suggest that this broad range of symptoms, having a single cause, be characterized, named, and entered into the taxonomy of diseases as a systemic neurological disorder. We opine that doing so would help to bring clinicians to a better awareness of the many physiological and behavioral manifestations of absent or significantly diminished orexinergic signaling, helping to improve the interactions they have with narcoleptic patients and the quality of the care they provide to them.

Keywords: narcolepsy, orexin.

Author: Executive Director of The NICER Foundation, Inc. Mailing address: 4002 Brookhill Road, Baltimore. e-mail: mturner@nicer.ngo.

Authorship: This article was conceived, written, edited and prepared for submission entirely by Moshe Turner with no assistance of any kind from anyone else.

Financial Support: There was no financial support of any kind.

Conflict of Interest: None

INTRODUCTION

Narcolepsy is classified as a central disorder of hypersomnolence in both the ICSD-3 (1), and the DSM-5 (2). People with narcolepsy have difficulty maintaining the waking state (3, 4, 5, 6), a function primarily of a small number of hypothalamic cells called both orexin, and hypocretin neurons (7, 8). Regardless of the still uncertain etiology of the disorder (9), abundant research has shown that the symptoms of narcolepsy result from the nearly complete loss or significant disabling of orexinergic signaling, manifesting as type 1 narcolepsy, with cataplexy, and type 2, without cataplexy (10, 11, 12).

Orexin neurons do more than stabilize arousal, and the pentad (formerly tetrad) of narcolepsy symptoms (13) comprise only the more visible or easily identifiable tip of the iceberg of dysregulation caused by disrupted orexinergic signaling. Orexin neurons integrate afferent limbic and autonomic signals (14, 15, 16, 17) and efferently direct fast physiological and behavioral responses to changing conditions. They regulate or modulate: locomotion and spontaneous physical activity (18, 19), mood and emotion (20, 21, 22), reward-seeking/addictive behavior (23, 24, 25, 26, 27), autonomic response to allostatic challenges (28,29), appetitive behaviors (food seeking and satiety) (30, 31, 32, 33, 34, 35), gastrointestinal function (36,37), nociception (38, 39), sex drive (40, 41), the micturition reflex (42), thermoregulation/ thermogenesis (43, 44), energy storage and expenditure (45, 46, 47, 48, 49), fear learning (50, 51, 52, 53), executive function and cognitive flexibility (54, 55, 56), memory formation (57), decision making (58, 59), olfaction (60) and other functions. They do this by signaling with the orexin peptides in conjunction with several other excitatory and inhibitory transmitters also expressed on orexin neurons (61, 62, 63).

Reading an ever-changing score, so to speak, orexin neurons direct the members of the neural orchestra (64,65,66) to play their parts on time and in key . Without this direction the music becomes discordant. Some members might try to play the piece on their own; for example, histamine neurons in the tuberomammillary nucleus of the posterior basal hypothalamus can assist with wakefulness (67, 68). Others might

elect to play an entirely different tune. The result is disharmony that increases over time. While the specific symptoms of narcolepsy are not progressive, the cumulative effects of consistently poor nighttime sleep and the systemic effects of the sustained loss of orexinergic signaling over time eventually manifest as problems such as hypertension, obesity, diabetes, depressive behaviors, etc. (69, 70, 71, 72, 73, 74).

That's a lot to unpack from a box labeled "sleep disorder". As demonstrated above, the symptoms of narcolepsy are only a subset of symptoms that belong to a much wider, encompassing disorder of disrupted orexinergic signaling. That larger disorder is neither named nor characterized in the taxonomy of diseases.

Regardless of how we got here, it is necessary to ask if it is wise or appropriate to allow the situation to persist. Should a disorder which causes such extensive physiological and behavioral dysfunction to remain classified as a hypersomnia? As mentioned in a previous article (75), general care providers and most specialists not working specifically in sleep medicine can go for a long time without coming across a narcoleptic patient. They are generally not trained to recognize narcolepsy at all, let alone to consider the interconnected nature of the many discrete physiological dysfunctions that defective orexinergic signaling gives rise to. Misclassifying a systemic disorder as a hypersomnia contributes to a lack of awareness that keeps it off the minds of most clinicians. That lack of awareness can cause difficulties to develop in the interactions between clinicians and narcoleptic patients.

Consider what might happen when even a person with an existing diagnosis of narcolepsy appears in a clinical setting presenting with one or more of these other symptoms not obviously related to narcolepsy. Sometimes such a patient will present with a baffling grab bag of apparently disconnected complaints. When that happens (and it does) the clinician could easily be forgiven for rendering a diagnosis of dysautonomia (76), or for simply finding the patient to be a bit hysterical, or depressed. Having a disorder of disturbed orexinergic signaling in the literature would help to bring clinicians to a greater awareness of its systemic effects beyond narcolepsy. That would surely help to improve the interactions that people with narcolepsy have with clinicians and the quality of the care they receive.

"Narcolepsy" has served well as a name for a sleep disorder since it was named by the French physician Jean-Baptiste-Edouard Gélineau in 1880 (77), and it still does. It is not necessary to undo over a century's worth of association of its symptoms with that name. However, now that the group of symptoms which constitute narcolepsy are known to be part of an encompassing disorder, that encompassing disorder should be named and entered into the literature as a distinct entity.

REFERENCES

1. American Academy of Sleep Medicine International Classification of Sleep Disorders - Third Edition (ICSD-3). Darien, IL American Academy of Sleep Medicine, 2014.
2. American Psychiatric Association. Sleep-Wake Disorders; Narcolepsy. In: Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5). Arlington, VA: American Psychiatric Association, 2013:372-8.
3. Mochizuki T, et al. Behavioral State Instability in Orexin Knock-Out Mice. J Neurosci. 2004 Jul 14; 24(28): 6291–6300.
4. Alexandre C, Andermann ML, Scammell TE, Control of arousal by the orexin neurons. Curr Opin Neurobiol. 2013 Oct; 23(5): 752–759.
5. de Lecea L, Sutcliffe JG, The hypocretins and Sleep. FEBS Journal 272 2005 5675-5688
6. Scammell TE, Arrigoni E, Lipton JO, Neural Circuitry of Wakefulness and Sleep. Neuron 93 2017: 747- 765
7. de Lecea L, Kilduff TS, Peyron C, et al. The hypocretins: hypothalamus specific peptides with neuroexcitatory activity. Proc Natl Acad Sci U S A. 1998;95(1):322–327.
8. Sakurai, T., et al Amemiya Orexins and orexin receptors: a family of hypothalamic

neuropeptides and G protein-coupled receptors that regulate feeding behavior. Cell 1998, 92(4), 577-586.
9. Slowik JM, Collen JF, Yow AG. Narcolepsy. [Updated 2022 June 21]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2023 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK459236/
10. Siegel JM, et al. A Brief History of Hypocretin/Orexin and Narcolepsy. Neurop sychopharmacology. 2001 November ; 25(5 Suppl): S14–S20.
11. Hara, J., Sakurai, T., Yamanaka, Y., Ishii, T., & Nakazato, Y. . Orexins mediate wakefulness and REM sleep through activation of hypothalamic neurons. Neuron 2001, 30(2): 345-356.
12. Prober, DA. Discovery of hypocretin/orexin ushers in a new era of sleep research. Trends Neurosci. 2018 February ; 41(2): 70–72.
13. Quaedackers L, Pillen S, Overeem S. Recognizing the Symptom Spectrum of Narcolepsy to Improve Timely Diagnosis: A Narrative Review. Nat Sci Sleep. 2021 Jul 7;13:1083-1096.
14. Li, J., Hu, Z. and de Lecea, L. (2014), Orexins integrate physiological functions. Br J Pharmacol, 171: 332-350.
15. Villano I, et al. Physiological Role of Orexinergic System for Health. Int J Environ Res Public Health. 2022 Jul 8;19(14):8353.
16. Mahoney CE, Cogswell A, Koralnik IJ, Scammell TE. The neurobiological basis of narcolepsy. Nat Rev Neurosci. 2019 Feb;20(2):83-93.
17. Soya S, Sakurai T. Evolution of Orexin Neuropeptide System: Structure and Function. Front Neurosci. 2020 Jul 10;14:691.
18. Karnani MM, Schöne C, Bracey EF, González JA, Viskaitis P, Li HT, Adamantidis A, Burdakov D. Role of spontaneous and sensory orexin network dynamics in rapid locomotion initiation. Prog Neurobiol. 2020 Apr; 187: 101771.
19. Perez-Leighton C, Little MR, Grace M, Billington C, Kotz CM. Orexin signaling in rostral lateral hypothalamus and nucleus accumbens shell in the control of spontaneous physical activity in high- and low-activity rats. Am J Physiol Regul Integr Comp Physiol. 2017 Mar 1;312(3):R338-R346.
20. Nevárez N, de Lecea L. Recent advances in understanding the roles of hypocretin/ orexin in arousal, affect, and motivation. F1000Res. 2018 Sep 6;7:F1000 Faculty Rev-1421.
21. Abbas MG, Shoji H, Soya S, Hondo M, Miyakawa T, Sakurai T. Comprehensive Behavioral Analysis of Male Ox1r (-/-) Mice Showed Implication of Orexin Receptor-1 in Mood, Anxiety, and Social Behavior. Front Behav Neurosci. 2015 Dec 10;9:324.
22. Siegel JM. Hypocretin (orexin): role in normal behavior and neuropathology. Annu Rev Psychol. 2004;55:125-48.
23. James MH, Mahler SV, Moorman DE, Aston-Jones G. A Decade of Orexin/ Hypocretin and Addiction: Where Are We Now? Curr Top Behav Neurosci. 2017;33: 247-281.
24. Moorman DE. The hypocretin/orexin system as a target for excessive motivation in alcohol use disorders. Psychopharmacology (Berl). 2018 Jun;235(6):1663-1680.
25. Aston-Jones G, et al. Lateral hypothalamic orexin/hypocretin neurons: A role in reward seeking and addiction. Brain Res. 2010 Feb 16;1314:74-90.
26. Mahler SV, Smith RJ, Moorman DE, Sartor GC, Aston-Jones G. Multiple roles for orexin/hypocretin in addiction. Prog Brain Res. 2012;198:79-121.
27. Pantazis CB, James MH, Bentzley BS, Aston-Jones G. The number of lateral hypothalamus orexin/hypocretin neurons contributes to individual differences in cocaine demand. Addict Biol. 2020 Jul;25(4):e12795.
28. Carter ME, Schaich Borg J, de Lecea L. The brain hypocretins and their receptors: mediators of allostatic arousal. Curr Opin Pharmacol. 2009 Feb;9(1):39-45.
29. James MH, et al. Exercise reverses the effects of early life stress on orexin cell reactivity in male but not female rats. Front Behav Neurosci. 2014 Jul 23;8:244.

30. Lee J, Raycraft L, Johnson AW. The dynamic regulation of appetitive behavior through lateral hypothalamic orexin and melanin concentrating hormone expressing cells. Physiol Behav. 2021 Feb 1;229:113234.
31. Kirchgessner AL. Orexins in the Brain-Gut Axis. Endocrine Reviews 2002 23(1):1–15
32. Tsujino N and Sakurai T. Orexin/Hypocretin: A Neuropeptide at the Interface of Sleep, Energy Homeostasis, and Reward System. Pharmacological Reviews June 2009, 61 (2) 162-176.
33. Sellayah D, Sikder D. Food for Thought: Understanding the Multifaceted Nature of Orexins, Endocrinology, Volume 154, Issue 11, 1 November 2013, Pages 3990–3999.
34. Inutsuka A, et al. Concurrent and robust regulation of feeding behaviors and metabolism by orexin neurons. Neuropharmacology 85 2014 451-460.
35. Barson JR. Orexin/hypocretin and dysregulated eating: Promotion of foraging behavior. Brain Res. 2020 Mar 15;1731: 145915.
36. Grabauskas G, Moises HC. Gastrointestinal-projecting neurones in the dorsal motor nucleus of the vagus exhibit direct and viscerotopically organized sensitivity to orexin. J Physiol. 2003 May 15;549 (Pt 1): 37-56.
37. Romański KW, Goździewska-Harłajczuk K. Role of orexins in regulation of gastrointestinal motility. Journal of Pre-Clinical and Clinical Research, 2009, Vol 3, No 2, 071-075.
38. Inutsuka A, Yamashita A, Chowdhury S, Nakai J, Ohkura M, Taguchi T, Yamanaka A. The integrative role of orexin/hypocretin neurons in nociceptive perception and analgesic regulation. Sci Rep. 2016 Jul 7;6:29480.
39. Kang X, Tang H, Liu Y, Yuan Y, Wang M. Research progress on the mechanism of orexin in pain regulation in different brain regions. Open Life Sci. 2021 Jan 20;16 (1):46-52.
40. Tyree SM, Borniger JC, de Lecea L. Hypocretin as a Hub for Arousal and Motivation. Front Neurol. 2018 Jun 6;9:413.
41. Pallav Sengupta P, et al. Orexins: the 'multitasking' neuropeptides in the energy metabolism and immune regulation of male reproduction. Chem. Biol. Lett., 2021, 8(4), 202-212.
42. Kobayashi M, et al. Involvement of orexin-A on micturition reflex in normal and cyclophosphamide-induced cystitis bladder in rat. Peptides. 2009 Dec;30(12):2348-56.
43. Zhang W, et al. Orexin neurons are indispensable for stress-induced thermogenesis in mice. J Physiol. 2010 Nov 1;588 (Pt 21):4117-29.
44. Sellayah D, Bharaj P and Sikder D. Orexin Is Required for Brown Adipose Tissue Development, Differentiation, and Function. Cell Metabolism 14, 2011 478–490 .
45. Teske JA, Mavanji V. Energy expenditure: role of orexin. Vitam Horm. 2012;89:91-109.
46. Milbank E, López M. Orexins/Hypocretins: Key Regulators of Energy Homeostasis. Front Endocrinol (Lausanne). 2019 Dec 10;10:830.
47. Goforth, P.B., Myers, M.G. (2016). Roles for Orexin/Hypocretin in the Control of Energy Balance and Metabolism. In: Lawrence, A., de Lecea, L. (eds) Behavioral Neuroscience of Orexin/Hypocretin. Current Topics in Behavioral Neurosciences, vol 33. Springer, Cham.
48. Goforth PB, Myers MG. Roles for Orexin/Hypocretin in the Control of Energy Balance and Metabolism. Current Topics in Behavioral Neurosciences. 2017;33:137-156.
49. Blais A, Drouin G, Chaumontet C, et al.. Impact of Orexin-A treatment on food intake, energy metabolism and body weight in mice. PLoS ONE, 2017, 12 (1), pp.1-14.
50. Soya, S., Takahashi, T.M., McHugh, T.J. et al. Orexin modulates behavioral fear expression through the locus coeruleus. Nat Commun 8, 1606 (2017).
51. Sears R, Fink A, Wigestrand MB, LeDoux JB. Orexin/hypocretin system modulates amygdala-dependent threat learning through the locus coeruleus. PNAS 2013 110 (50) 20260- 20265.
52. Yamashita, A., Moriya, S., Nishi, R. et al. Aversive emotion rapidly activates orexin neurons and increases heart rate in freely moving mice. Mol Brain 14, 104 (2021).

53. Flores A,et al. Facilitation of Contextual Fear Extinction by Orexin-1 Receptor Antagonism Is Associated with the Activation of Specific Amygdala Cell Subpopulations, International Journal of Neuropsychopharmacology, Volume 20, Issue 8, August 2017, Pages 654–659.
54. Durairaja, A, Fendt, M. Orexin deficiency modulates cognitive flexibility in a sex-dependent manner. Genes, Brain and Behavior. 2021; 20:e12707.
55. Naumann A, Bellebaum C and Daum I. Cognitive deficits in narcolepsy. Journal of Sleep Research, 2006 15: 329-338.
56. Freeman LR, Aston-Jones G. Activation of Medial Hypothalamic Orexin Neurons during a Go/No-Go Task. Brain Res Vol. 1731, 2020, 145928.
57. Aitta-aho T, Pappa E, Burdakov D, Apergis-Schoute J. Cellular activation of hypothalamic hypocretin/orexin neurons facilitates short-term spatial memory in mice. Neurobiology of Learning and Memory Vol.136, 2016, Pages 183-188.
58. Summers CH, et al. Orexin/hypocretin receptor modulation of anxiolytic and antidepressive responses during social stress and decision-making: Potential for therapy. Brain Res Vol. 1731, 15 March 2020, 146085
59. Bayard S, et al. Decision Making in Narcolepsy with Cataplexy. Sleep, Volume 34, Issue 1, January 2011, Pages 99–104.
60. Baier PC, et al. Olfactory dysfunction in patients with narcolepsy with cataplexy is restored by intranasal Orexin A (Hypocretin-1). Brain, Volume 131, Issue 10, October 2008, Pages 2734– 2741.
61. Chou TC, et al. Orexin (Hypocretin) Neurons Contain Dynorphin. The Journal of Neuroscience, 2001, Vol. 21 RC168.
62. Crocker A, et al. Concomitant loss of dynorphin, NARP, and orexin in narcolepsy. Neurology Oct 2005, 65 (8) 1184-1188
63. Furutani N, et al. Neurotensin Co-Expressed in Orexin-Producing Neurons in the Lateral Hypothalamus Plays an Important Role in Regulation of Sleep/Wakefulness States. PlosOne April 2013 | Volume 8 | Issue 4 | e62391.
64. Graebner AK, Iyer M, Carter ME. Understanding how discrete populations of hypothalamic neurons orchestrate complicated behavioral states. Front Syst Neurosci. 2015 Aug 4; 9:111.
65. Lee I, et al. The acclimatization of Haenyeo to a cold environment and occupational characteristics evaluated by orexin and irisin levels. Ann Occup Environ Med. 2022 Oct 13;34:e28.
66. Eriksson KS, Sergeeva OA, Haas HL, Selbach O. Orexins/hypocretins and aminergic systems. Acta Physiol (Oxf). 2010 Mar;198 (3):263-75.
67. Shan L, Dauvilliers Y, Siegel JM. Interactions of the histamine and hypocretin systems in CNS disorders. Nat Rev Neurol. 2015 Jul;11(7):401-13..
68. Scammell TE, Jackson AC, Franks NP, Wisden W, Dauvilliers Y. Histamine: neural circuits and new medications. Sleep. 2019 Jan 1;42(1):zsy183.
69. Jennum PJ, Plazzi G, Silvani A, Surkin LA, Dauvilliers Y. Cardiovascular disorders in narcolepsy: Review of associations and determinants. Sleep Med Rev. 2021 Aug; 58:101440. doi: 10.1016/j.smrv.2021. 101440. Epub 2021 Jan 23. PMID: 33582582.
70. Dauvilliers Y, Jaussent I, Krams B, Scholz S, Lado S, et al. (2012) Non-Dipping Blood Pressure Profile in Narcolepsy with Cataplexy. PLOS ONE 7(6): e38977.
71. Hampton T. Narcolepsy and Weight Gain. JAMA. 2011;306(21):2315.
72. Tsuneki H, Wada T, Sasaoka T. Role of orexin in the central regulation of glucose and energy homeostasis. Endocr J. 2012;59(5): 365-74.
73. Rani M, Kumar R, Krishan P. Role of orexins in the central and peripheral regulation of glucose homeostasis: Evidences & mechanisms. Neuropeptides. 2018 Apr; 68: 1-6.
74. Kapella MC, Berger BE, Vern BA, Vispute S, Prasad B, Carley DW. Health-related stigma as a determinant of functioning in young adults with narcolepsy. PLoS One. 2015 Apr 21;10(4):e0122478.

75. Turner M. The Treatment of Narcolepsy With Amphetamine-Based Stimulant Medications: A Call for Better Understanding. J Clin Sleep Med. 2019 May 15;15(5):803-805.
76. Klein G, Burghaus L, Vaillant M, Pieri V, Fink GR, Diederich N. Dysautonomia in narcolepsy: evidence by questionnaire assessment. J Clin Neurol. 2014 Oct;10 (4):314-9.
77. Gélineau J, De la narcolepsie. Gazette des Hôpitaux Civils et Militaires 1880 ; part a, 53 : 626-628, part b, 54; 635-637.

Great Britain Journal Press Membership

For Authors, subscribers, Boards and organizations

Great Britain Journals Press membership is an elite community of scholars, researchers, scientists, professsionals and institutions associated with all the major disciplines. Great Britain memberships are for indivi - duals, research institutions, and universities. Authors, subscribers, Editorial Board members, Advisory Board members, and organizations are all part of member network.

Read more and apply for membership here:
https://journalspress.com/journals/membership

For Authors

Author Membership provide access to scientific innovation, next generation tools, access to conferences/seminars/ symposiums/webinars, networking opportunities, and privileged benefits. Authors may submit research manuscript or paper without being an existing member of GBJP. Once a non-member author submits a research paper he/she becomes a part of "Provisional Author Membership".

For Institutions

Society flourish when two institutions Come together." Organizations, research institutes, and universities can join GBJP Subscription membership or privileged "Fellow Membership" membership facilitating researchers to publish their work with us, become peer reviewers and join us on Advisory Board.

For Subscribers

Subscribe to distinguished STM (scientific, technical, and medical) publisher. Subscription membership is available for individuals universities and institutions (print & online). Subscribers can access journals from our libraries, published in different formats like Printed Hardcopy, Interactive PDFs, EPUBs, eBooks, indexable documents and the author managed dynamic live web page articles, LaTeX, PDFs etc.

GO GREEN AND HELP
SAVE THE ENVIRONMENT

JOURNAL AVAILABLE IN

PRINTED VERSION, INTERACTIVE PDFS, EPUBS, EBOOKS, INDEXABLE DOCUMENTS AND THE AUTHOR MANAGED DYNAMIC LIVE WEB PAGE ARTICLES, LATEX, PDFS, RESTRUCTURED TEXT, TEXTILE, HTML, DOCBOOK, MEDIAWIKI MARKUP, TWIKI MARKUP, OPML, EMACS ORG-MODE & OTHER

support@journalspress.com
www.journalspress.com

*THIS JOURNAL SUPPORT AUGMENTED REALITY APPS AND SOFTWARES