



WJMER

World Journal of Medical Education and Research

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Predictive Markers for Surgical Site Infection in Laparoscopic Appendicectomy

Undergraduates or Under Stress: A Study from an Indian Medical School's Perspective

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Successes and Limitations of Community-Based Education Service at Moi University School of Medicine, Eldoret, Kenya

Constructing the Human Face: Learning Anatomy Through Sculpture

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Introduction

The World Journal of Medical Education and Research (WJMER) (ISSN 2052-1715) is an online publication of the Doctors Academy Group of Educational Establishments. Published on a quarterly basis, the aim of the journal is to promote academia and research amongst members of the multi-disciplinary healthcare team including doctors, dentists, scientists, and students of these specialties from around the world. The principal objective of this journal is to encourage the aforementioned, from developing countries in particular, to publish their work. The journal intends to promote the healthy transfer of knowledge, opinions and expertise between those who have the benefit of cutting edge technology and those who need to innovate within their resource constraints. It is our hope that this will help to develop medical knowledge and to provide optimal clinical care in different settings. We envisage an incessant stream of information flowing along the channels that WJMER will create and that a surfeit of ideas will be gleaned from this process. We look forward to sharing these experiences with our readers in our editions. We are honoured to welcome you to WJMER.

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WELCOME

It is with great pleasure that we bring you the sixteenth edition of the World Journal of Medical Education and Research (WJMER). This edition coalesces numerous pioneering and informative articles which explore salient areas of research. It offers the reader an insight into the innovative and promising research that is currently being undertaken throughout the world.

In the opening article, Darwin conducts a retrospective study in an attempt to examine predictive markers for surgical site infection following a laparoscopic appendectomy. The study, carried out in Sydney, Australia, divulges that the pre-operative use of serum albumin represents a significant predictor for surgical site infection. The article thus advocates that the tendency to use serum albumin pre-operatively should be further investigated.

Govindaraja and colleagues endeavour to determine the primary instigators of angst amongst undergraduate students of a medical school in the Tamil Nadu region of India. In addition, an effort is made to identify mechanisms implemented by students to manage such feelings. The results reveal a correlation between pressure related to academic progression and stress amongst medical students.

The following article seeks to determine if a relationship between socio-demographic factors and depression amongst nurses at the Moi Teaching and Referral Hospital in Kenya exists. Nyamwata and colleagues conclude that the connection between the two aspects is significant and thus propound that the hospital implements strategies to prevent instances of depression amongst its nurses.

Varahabhatla, Sharmila, Mithilesh and Nataliya aim to discern effective methods for the treatment and prevention of psoriasis. The article infers that the use of topical corticosteroids can reduce the clinical manifestation of the condition, as well as alleviate other associated effects such as anxiety.

Virajitha and colleagues analyse the plasma content of pro-ANP and NT-pro-BNP in order to deduce the impact on the neuro-hormonal auto-regulatory mechanism leading to the development of arterial hypertension and stiffness. The study evinces a close positive correlation between pro-ANP, NT-pro-BNP and pulse wave velocity.

In an effort to foreground the challenges that emerge with the implementation of the SPICES model at Moi University College of Health Sciences in Kenya, Katwa and colleagues examine the responses of students, lecturers and administrative staff. The results evidence that, in instances where resources are limited, the enactment of the SPICES model poses challenges.

Katwa, Ayiro, Kei and Baliddawa evaluate the strengths and limitations of a Community-Based Education Service at Moi University School of Medicine in Kenya. The article proposes that this model has the potential to encourage students to practice community-based health care. Yet, it seems that difficulties arise where resources are finite.

Bechar provides a review of a facial sculpture course that was recently conducted in Birmingham. The review highlights the immense value of the course for surgical trainees and, indeed, any individual who is interested in facial reconstruction.

We sincerely hope that you find each article in this edition enlightening, intellectually-stimulating, and enjoyable to read.

With very best wishes,

Ms Karen Au-Yeung
Editor

Ms Rebecca Williams
Associate Editor

Professor Stuart Enoch
Editor-in-Chief

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Predictive Markers for Surgical Site Infection in Laparoscopic Appendicectomy

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Abstract

Background: The risk of surgical site infection (SSI) is considered one of the most serious issues following laparoscopic appendicectomy (LA). This study seeks to analyse the predictive value of commonly ordered routine admissions laboratory tests for SSI in LA.

Methods: This retrospective study was conducted among patients at least 18 years of age with acute nonperforated appendicitis who underwent LA at a tertiary care hospital in Sydney, Australia between 1 July 2015 and 30 June 2016. Utilising patients' records, results of routine admissions laboratory tests were collected. The collected preoperative lab results included white blood cell count (WBC), red blood cell count (RBC), and serum albumin (S. alb) levels. The patients were then divided into two groups based on the occurrence of an SSI.

Results: A total of 166 laparoscopic appendicectomies were performed during the study period. Of these, 148 were for non perforated appendicitis, and 144 had patient records suitable for statistical analysis. The mean WBC was 8.17×10^3 cells/mm³ (range = 5.8-12.1). The mean RBC was 4.99×10^3 cells/mm³ (range = 3.8-6.2). S. alb showed a mean of 3.79 g/dL (range = 2.8-5.1). Only a minority of patients (n=7, 4.9%) suffered from a SSI. 6 patients had superficial incisional infections, and 1 patient had an organ/space infection.

Conclusion: Among the laboratory tests investigated, only preoperative serum albumin was identified as a significant predictor for SSI (P = 0.008). As SSI can be a serious postoperative morbidity, the possible use of preoperative S. alb as a screening tool for preventable SSI should be further investigated.

Key Words

Surgical Site Infection; Appendicectomy; Predictive Markers; General Surgery; Nosocomial Infection

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Introduction

Postoperative surgical site infections (SSI) remain a major cause of morbidity among surgical patients. A study by Graves (2009)¹ estimated that over 21,000 cases of SSI occur annually in Australia, and other studies show an overall SSI incidence of 2-12%^{2,3,4}. A similar study in the United States determined that approximately 500,000 cases occur annually, among 27 million surgical procedures⁵. SSI accounts for approximately one quarter of nosocomial infections⁶, and is known to impose serious burdens on patients, increasing morbidity and mortality rates, as well as lengthening hospitalisation and increasing costs^{7,8}.

As such, any predictive markers that have a potential to identify and prevent the risks for this situation would be hugely beneficial, but are rarely utilised on a clinical basis⁹. This study seeks to analyse the value of commonly ordered routine admissions laboratory tests in predicting SSI risk in

patients undergoing laparoscopic appendicectomy (LA) for nonperforated appendicitis.

Method

The pathologic state of the appendix has been shown to be the most important determinant of postoperative infection^{10,11}. Incidence of SSI is four to five times higher following appendicectomy for perforative or gangrenous appendicitis. Hence, this study analysed only appendicectomies for nonperforated appendicitis. In addition, since its introduction in 1983, LA has been conducted much more frequently than open appendicectomy due to its minimal invasiveness¹². As such, only procedures performed by LA were considered.

The study was conducted retrospectively, with patients of at least 18 years of age with acute nonperforated appendicitis who underwent LA at a tertiary care centre in Sydney, Australia between 1 July 2015 and 30 June 2016. The results of routine

admissions laboratory tests were collected utilising the patients' medical records, and the results for white blood cell count (WBC), red blood cell count (RBC), and serum albumin levels (S. alb) were extracted. Any patients that did not have results for these laboratory tests in their medical records were not included.

The LA procedures were carried out using three ports, as per Society of American Gastrointestinal and Endoscopic Surgeons guidelines¹³: one 10 mm camera port at the umbilicus, and two 5 mm secondary ports placed at the left lower quadrant and suprapubic regions respectively.

The state of nonperforated appendicitis, and the presence of SSI, was determined through the final pathologic reports. SSI classifications were defined according to Centre for Disease Control guidelines¹⁴. Statistical analyses were performed using IBM SPSS Statistics for Macintosh, Version 23.0.0 (IBM Corp., Armonk, NY, USA), and logistic regression analysis was applied. A P-value of <0.05 was deemed to be statistically significant.

Results

A total of 166 laparoscopic appendicectomies were performed during the study period, with 148 performed for nonperforated appendicitis. Of these, 144 had records suitable for statistical analysis.

The average age of the patients was 27.4 (range = 6-67), with 54.2% (n=78) of the patients being male. The mean preoperative WBC was 8.17 x10³ cells/mm³ (range = 5.8-12.1). The mean preoperative RBC was 4.99 x10³ cells/mm³ (range = 3.8-6.2). Preoperative S. alb showed a mean of 3.79 g/dL (range = 2.8-5.1). Only a minority of patients (n=7, 4.9%) suffered from a SSI. 6 patients had superficial incisional infections, and 1 patient had an organ/space infection.

Of the measured parameters, only preoperative S. alb was significantly different between the SSI group and the non-SSI group (P = 0.008). WBC (P = 0.433), RBC (P = 0.534), and age (P = 0.374) showed no statistical significance (Table 1).

	Mean	SD	P-value
Preoperative WBC			
SSI	7.96	1.78	0.433
Non-SSI	8.18	1.27	
Total	8.17	1.29	
Preoperative RBC			
SSI	4.87	0.57	0.534
Non-SSI	5.00	0.65	
Total	4.99	0.64	
Preoperative S. alb			
SSI	3.20	0.51	0.008
Non-SSI	3.83	0.55	
Total	3.80	0.54	
Age			
SSI	27.3	8.42	0.374
Non-SSI	27.4	12.3	
Total	27.4	12.1	

Table 1: Parameters predicting surgical site infection.

Discussion

This study focussed on identifying a routine admission laboratory test that could be used for predicting susceptibility to postoperative surgical site infection. The only statistically significant predictor of SSI in laparoscopic appendectomies was preoperative serum albumin ($P = 0.008$). This finding is in keeping with previous literature^{15,16,17,18,19}, and in contrast to a previous study that reported that preoperative total lymphocyte count was the only predictor of delayed wound healing²⁰.

It has previously been shown that serum albumin is a reliable indicator of nutritional status, and low serum albumin can be indicative of preoperative nutritional depletion. Matar et al have suggested the use of nutritional biomarkers as screening tests for preventing surgical site infection²¹, and measures taken to counteract nutritional deficiency have been shown to successfully decrease the incidence of SSI from 12.9% to 1.9%⁹. This study has shown that serum albumin is an effective biomarker for SSI, and could potentially play a role in identifying patients for the implementation of nutritional support protocols to reduce infection rates.

Conclusion

The results of routine laboratory admissions were retrospectively examined to determine if any results could be used as a predictive biomarker for susceptibility to postoperative surgical site infection. Preoperative serum albumin level was identified as the only statistically significant predictor of surgical site infection ($P = 0.008$). As surgical site infection is a serious and preventable cause of postoperative morbidity, this study indicates that using preoperative serum albumin as a screening measure to identify patients at risk of SSI could be beneficial, and should be investigated further.

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Undergraduates or Under Stress: A Study from an Indian Medical School's Perspective

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Abstract

Background: Medical students experience considerable academic challenges which make them vulnerable to stress and depression. Parental pressure and the traditional educational system with curriculum overload also keep stress snowballing among them with little time for co-curricular activities. It is imperative to determine the prevalence and sources of stress and identify the coping strategies adopted by the students to handle stress.

Methods: 250 medical students participated in the study. Constructs from three questionnaires were used to formulate the self-reporting questionnaire. Mean and bivariate regression analysis were performed to examine the association between stressors and incidence of stress. The COPE Inventory was used to examine the coping strategies.

Results: The prevalence of stress among medical students was 59.3%. Mean scores: high for academic pressure, mild to moderate for inter, intrapersonal and financial factors while mild for clinical environmental factors. Academic pressure was significant among females, increasing years of education. Intra and interpersonal issues caused stress in Year 4. Coping strategies used did not exhibit any relationship with stress.

Conclusion: Academic pressure appears to have a strong influence on medical students' stress. Coping styles did not show a significant influence on stress.

Key Words

Medical Students; Stress; Coping Styles

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Introduction

Stress is described as perception of a stressor and response to it. For medical students, it is an ongoing process commencing from admission to medical school, continuing in clinical practice¹. It is a major social and mental health concern that needs to be addressed.

Rigorous academic and clinical work compounded with high tuition fees and long hours of study make medical education stressful². Students perceiving stress in the learning environment may or may not resort to appropriate coping strategies. Coping strategies are of two types. Problem-focused coping addresses the source of stress and emotion-focused coping underpins the emotional response to it³. In this study we resort to find out the prevalence and sources of stress with coping strategies adopted by medical students.

The purpose of this study:

1. To examine the prevalence of stress among undergraduates in a private medical institute in India.
2. To identify the important stress factors among medical students in India.
3. To identify the coping styles of students and the effects on stress.

Methods:

The study was conducted among 250 undergraduate medical students aged 18 years and above in a private medical institute in Tamil Nadu, India. The study and questionnaire were in accordance with the ethical guidelines outlined by the University (Ethics number: INBS366). Students were briefed about the study, informed consent was obtained, confidentiality of information and anonymity were assured with freedom to withdraw from the study at any given point.

This study is unique in terms of the nature of defining and grouping of variables. Therefore, no one suitable validated questionnaire could be used. An indigenous, descriptive research questionnaire was devised by adapting statements or constructs from various available stress survey questionnaires.

The constructs focusing on academic pressure and inter and intrapersonal issues were adapted from the Medical Student Stress Questionnaire (MSSQ) by⁴constructs examining the effect of financial problems were derived from Students' Stress Study Questionnaire⁵ and Student Stress Questionnaire⁶ to examine the prevalence of stress among students in clinical environment. The COPE Inventory⁷was used to examine the coping strategies among medical undergraduates.

The reliability and validity of the constructed questionnaire was tested prior to the study. Pearson's correlation was used to evaluate the strength of the relationship between the variables. A multiple regression was carried out to examine the relationship between the proposed stressor factors and the stress. A p-value of less than 0.05 was considered to be significant.

A questionnaire with 58 questions in two sections was used to achieve the research objectives. The first included demographic information, while the second section comprised statements on academic related stressors¹³, interpersonal and intrapersonal stressors⁷, financial problems⁴ and environmental factors⁶. In total, 30 statements encompassed four variables and were graded on a Likert scale from 0= no stress, 1= mild stress, 2= moderate stress, 3= high Stress and 4= severe stress. The average family income of students was categorizes as 1= < Rs 10000, 2= Rs 10000 – 50000, 3= Rs 50000 - Rs100000 and 4= > Rs 100000.

In addition, a COPE inventory measured coping strategies with 28 constructs, 9 for problem-based coping and 19 on emotion-based coping. The dependent variable, stress was measured using 4 constructs. Nominal, ordinal and interval scale were used in the questionnaire.

Significance of Stress scores

A high score in a category indicated that medical students perceive events or activities in that respective category as stressful. Perceived stress was categorised under four major groups, ranging from mild, moderate (reasonable stress but manageable), high (disturbed emotions with mild compromise in daily activities) and severe stress (disturbs emotions badly with much compromise in daily activities.)

Statistical Package for the Social Science (SPSS) software was utilised to perform the data analysis. *P-value* of 0.05 was considered significant. Therefore, in order to ascertain reliability and validity, Cronbach Alpha, Kaiser -Meyer-Olkin (KMO) and the Bartlett's Test were performed. Prior to analysis, data was checked for normality. Frequency distribution was used to analyse the demographic details of respondents and descriptive mean analysis was used to analyse the factors influencing stress. The level of stress was determined from the cumulated stress score of the four separate constructs measuring stress as whole. Pearson's correlation was done to evaluate the strength of the relationship between the variables. Next, a multiple regression was carried out to examine the relationship between the proposed independent variable and the dependent variable. In addition, One-way ANOVA was also performed to examine the relationship between the demographic variables and the independent variables.

Results:

Mean Analysis

The likert scale employed in this study was from 0-4 where 0 indicated no stress, 1 denoted mild stress, 2 referred to moderate stress, 3 equated to high stress and 4 implied severe stress. The highest overall mean stress score was observed with academic pressure, Interpersonal/intrapersonal issues recorded mild to moderate stress and financial problems caused mild stress in these students. Interestingly, clinical environmental issues imposed the least stress. The frequency of coping strategies used was tested in a separate inventory with 0-3 scale, where 0 referred to 'not at all doing' and 3 corresponded to 'doing very frequently.

Relationship between variables

Pearsons' Correlation was used to analyse the strength of a linear relationship between variables. The coefficient values were statistically significant between all variables (p -value < 0.01) indicated positive, mediocre relationship between the variables (Table 2).

Multiple regression analysis revealed that academic pressure, interpersonal and intrapersonal issues, financial problems and clinical environmental pressure have a strong influence on stress. Interestingly, the findings also show that financial pressure has the strongest influence on stress followed by interpersonal and intrapersonal issues, academic pressure and clinical environmental pressure (Table 3).

Variables	Mean	Standard Deviation	Rank	Skewness	Kurtosis
Academic Pressure (AR)	2.23	0.72	1	-0.22	0.30
Interpersonal and Intrapersonal Issues (IR)	1.31	0.85	3	0.58	0.29
Financial Problems (FP)	1.16	1.00	4	0.69	0.32
Clinical Environmental Pressure (EP)	0.99	0.78	5	0.85	0.30
Coping Strategy (CP)	1.33	0.43	2	-0.22	0.16
Stress (S)	1.38	0.67	-	0.92	0.49

Table 1: Descriptive Analysis of Tested Variables.

Variables	AR	IR	FP	ER	CP	Stress
AR	1	0.536**	0.308**	0.404**	0.250**	0.480**
IR	0.536**	1	0.338**	0.379**	0.349**	0.516**
FP	0.308**	0.338*	1	0.335**	0.239**	0.614**
ER	0.404**	0.379**	0.335**	1	0.325**	0.446**
CP	0.250**	0.349**	0.239**	0.325**	1	0.311**
Stress	0.480**	0.516**	0.614**	0.446**	0.311*	1

** Correlation significant at 0.01 level (2-tailed)

AR, Academic Pressure; IR, Interpersonal and Intrapersonal Issues; FP, Financial Problems; ER, Clinical Environmental Issues; CP, Coping Strategies

Table 2: Pearsons' Correlation Coefficient Analysis.

Independent Variables	Model 1		Model 2	
	Standardised coefficients β	t statistics	Standardised coefficients β	t statistics
AR	0.160	3.05**	0.149	3.07**
IR	0.212	3.97**	0.176	4.27**
FP	0.434	9.24**	0.290	9.37**
ER	0.149	3.02**	0.137	3.26**
CP	0.048	1.02 ^{ns}	-	-
Constant	0.271	2.29*	0.345	3.713**
R ²	0.537		0.535	
Adjusted R ²	0.528		0.528	
F test	59.31**		73.87**	

** p-value < 0.01 ; * p-value <0.1 ; ns p-value >0.1

Table 3: Regression Analysis.

	AR	IR	FP	ER	CP
Gender	20.753**	1.411	0.040*	0.075	0.318
Age	3.689*	2.008	6.735*	1.466	0.021
Marital Status	3.408*	0.347	11.201**	2.743	0.382
Nationality	0.902	1.867	1.368	0.520	0.319
Year of study	4.560**	2.940*	4.670**	1.157	0.083
Average family income	2.301*	1.630	8.882**	0.679	4.749**

** p-value < 0.01; * p-value <0.1; ns p-value >0.1

AR, Academic Pressure; IR, Interpersonal and Intrapersonal Issues; FP, Financial Problems; ER, Clinical Environmental Issues; CP, Coping Strategies

Table 4: Summary of one-way ANOVA results.

Variables	Classification	AR	IR	FP	ER	CP
Gender	Male	2.00		1.15		
	Female	2.40		1.17		
Age	18 – 20	2.17		1.05		
	21 – 23	2.35		1.39		
Marital Status	Single	2.22		1.15		
	Married	3.16		3.50		
Nationality	Indian					
	Others					
Year	Year 1	2.16	1.44	1.24		
	Year 2	{ 2.14	{ 1.13	{ 0.88		
	Year 3	{ 2.32	{ 1.33	{ 1.23		
	Year 4	{ 2.56 }	{ 1.54	{ 1.50		
Average Family Income	< 10 000	2.10		1.95		
	10000 -50 000	{ 2.40		{ 1.58		
	50000-100 000	{ 2.24		{ 1.07 }		
	Above 100 000	{ 2.11		{ 0.89 }		

** p-value < 0.01 ; * p-value <0.1 ; ns p-value >0.1

Table 5: Summary of Post-hoc Bonferroni Test.

Relationship between demographic variables and stressor factors

An additional one-way ANOVA was conducted on gender, age, marital status, nationality, year of study and average family income and results are shown in Table 4. One-way ANOVA indicated a significant difference between academic pressure experienced by males and females. However, for variables with more than two categories such as Year of study and average family income, the relationships which were found to be significant were further individually tested using a post-hoc Bonferroni's test (Table 5).

Note: Values representing individual means for categories within the listed variables indicate significant difference between respective groups AR, Academic Pressure; IR, Interpersonal and Intrapersonal Issues; FP, Financial Problems; ER, Clinical Environmental Issues; CP, Coping Strategies. Academic pressure appears to be a very interesting variable for further exploration. This test suggests that female students or students aged 21 to 23, students in Year 4 and students from lower family income experienced significantly more pressure. Intrapersonal and interpersonal issues led to stress with increasing year of education, highest being in Year 4.

Discussion

Prevalence of stress: The prevalence of stress in undergraduate medical students in this study was an appalling 59.3%. Among the stress factors, financial pressure was high, interpersonal, intrapersonal pressure and academic pressure was mild to moderate and clinical environmental pressure was mild.

The learning environment in a medical school often imposes psychological strain for students. Several studies across the globe have reported stress, burnout, anxiety and psychological morbidity among students^{8,9}.

The prevalence of stress in this study was high and similar to the findings of other researchers^{10, 11, 1, 12}. The challenges specific to medical undergraduates include a rigid educational structure, taxing curriculum, long training hours, expectations of the society and chronic exposure to emotionally stressful situations such as death¹³. In Singapore, it was found that 49.6% of medical undergraduates encountered significant stress and 64.6% reported that more than 60% of their total life stress was due to medical school^{14, 15}. From India have reported stress culminating in suicidal ideation in students. These alarming facts indicate that there is increased prevalence of physiological and psychological morbidity in medical students.

Factors affecting stress in medical students:

Among these factors, financial pressure was found to be the strongest variable contributing to stress. This is in confirmation with the findings of other researchers^{16, 17, 18}. Upsurge in the number of medical students in classrooms has resulted in competition for the limited financial aid available. In addition, tuition fees and living expenses have escalated steadily adding to the burden¹⁹.

The second most influential variable on stress was interpersonal and intrapersonal issues. This was in agreement with authors reporting that psychosocial problems are often a major concern contributing to stress in medical students^{13, 20, 21}. Competitive, arrogant classmates, insulting and rude residents are among the causes of interpersonal stress. In addition, interaction with patients can also be stressful to students. Not all patients give consent to be examined by medical students. Often, their credibility are questioned and cynical remarks are passed. Interestingly, in this study, among the statements measuring stress due to interpersonal and intrapersonal issues, communication, presentations and discussions held in class recorded the lowest mean, implying that these activities did not impose a significant stress. Communication or language was not a barrier in these students and explained their participative and peer-learning involving discussions and presentations.

Academic pressure: It was also found to be significantly inducing stress in medical students in India. This was akin to several studies emphasizing that academic pressure was an important stressor occurring in medical students^{22, 21}. Medical education in India follows the traditional curriculum with no apparent mechanism for horizontal and vertical integration of disciplines. Didactic lectures are verbose conveying facts with no emphasis on broader concepts often leading to failure of understanding the subject²³.

Clinical environmental pressure: Interestingly in this study, this recorded the lowest mean (Rank 5) indicating mild stress to students. This could be due to inclusion of students from Year 1 to Year 4 and not focussed on a particular year. Reduction in stress owing to clinical environment is possible over time as students who initially expressed marked distress eventually deliberated adjustment to the experience and tended to be more reflective and less reactive at a later stage²⁴.

Coping strategies: The frequency of coping strategies however did not have a significant effect on stress in medical students. This was contradictory to prior studies with a strong positive

relationship between the effectiveness of coping strategies and stress^{25,26,27}. This was probably due to absence of awareness of available active coping strategies. Coping among students was mostly emotion-focussed and had only served as a temporary measure to allay stress. Seeking counselling is often associated with a negative connotation in the general population. Therefore, medical students resorted to conservative coping strategies such as family, friends and religion.

Limitations:

1. The sample population of medical students may not be representative of the whole medical students' community in India.
2. The questionnaires were self-reported.

Conclusion

Stress in medical education may generate an impetus to learn or could translate into an unbearable mental burden. This study emphasises that academic pressure, interpersonal and intrapersonal issues, financial pressure and clinical environmental issues led to significant stress. Financial pressure demonstrated the strongest influence on stress. Coping strategies resorted to, did not appear to alleviate stress. Therefore, it is imperative that students be made aware of coping strategies to transform to a healthier learning environment. Counselling should advocate a more problem-focussed approach where the situation is analysed, problem identified and necessary action taken to mitigate stress.

Recommendations

Stress reduction efforts in medical schools is utmost important to prevent burnout among students and to make the course more attractive in the eyes of the younger generation.

Personal-level

- Mindfulness-based stress reduction.
- Medical schools often educate students how to care for their patients, but does not equip them with the knowledge of caring for themselves. Physicians and students can share coping strategies in Ballint groups.

University administrators

- "REACHOUT" programs to primarily incorporate counselling service as well as stress reduction classes.
- A 24-hours hotline should be available for students who intend to seek help.
- A wellness elective should be incorporated into their medical curriculum, preferably into the Year 1 curriculum to facilitate in their adaptation into the new environment alleviating initial shock.

Medical Education Board

- Revamp the traditional curriculum.
- Focus on blending education strategies with the curriculum to achieve both horizontal and vertical integration. This underpins the basis for a spiral curriculum model suggested by University of Dundee which aims to mould medical students into better individuals by the time they leave medical school with better attitude, cognitive thinking and skills.

Government & Financial institutes

- Pragmatic solutions through proposals where physicians pays for medical school education after completion of residency or fellowship over a 10-year time interval.
- The Government scholarships should also be extended to deserving candidates on merit basis.

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Association between Depression and Socio Demographic Factors among Nurses Working in Moi Teaching and Referral Hospital, Eldoret, Kenya

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Abstract

Objectives: To determine the relationship between socio demographic factors and depression among nurses working at Moi Teaching and Referral Hospital.

Methods: A cross-sectional design was employed. Stratified sampling technique was used to select 281 participants from the population. A structured questionnaire was used to collect information on the socio-demographic characteristics of the nurses, Beck's Depression Inventory to assess the symptoms of depression among nurses and Interview Schedules with the heads of nursing departments on factors associated with depression among nurses. STATA version 13 was used to analyze data. Descriptive statistics was used to summarize the data. Bivariate and multivariate statistics was applied to examine relationships between dependent and independent variables. The findings were presented using tables and graphs. The study sought approval by MMUST Institutional Review Board and Institutional Research and Ethics committee of Moi Teaching and Referral Hospital, Moi University School of Medicine. Informed consent of participants was adhered to during the study.

Results: Gender showed a statistically significant relationship with $P < 0.000$, age $P < 0.015$, marital status $P < 0.007$ while religion showed an insignificant relationship with $P < 0.718$. Work-related factors had a strong relationship with the depression status, these included education level, department, shift, income and religion. Majority of these variables showed a statistically significant relationship, i.e. education level had a $P < 0.002$, department had a $P < 0.014$, shift had a $P < 0.013$, income $P < 0.008$, responsibility $P < 0.001$ while work experience showed an insignificant relationship evidenced by the $P < 0.553$.

Conclusion: On the basis of the study findings, the researcher recommends that the policy makers at MTRH should formulate policies that will help prevent depression among nurses and improve service delivery

Key Words

Depression; Nursing; Stressors; Adaptation

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Introduction

Depression is a significant public health concern worldwide and has been ranked as one of the illnesses having the greatest burden for individuals, families, and society (WHO, 2002). The socio demographic factors of age, gender, marital status, education and religion have consistently been identified as important factors associated with depression. Previous research has found that age is one of the demographic characteristics that is associated with depression. Many people with depression also have symptoms of anxiety, a situation referred to as co-morbidity. There can be physical symptoms too, such as feeling constantly tired, sleeping problems, having no appetite or sex drive and complaining of various aches and pains and the severity of the symptoms varied (A. T Beck, 2013). At its mildest level, one could feel

persistently low in mood, while at its most severe depression could make one feel suicidal and that life was no longer worth living (ibid). Depression was not just the result of a chemical imbalance in the brain and it was not simply cured with medication. Depression was caused by a combination of biological, psychological and social factors.

Poor mental health among nurses not only hinders professional performance but also affects the quality of healthcare provided. Nurses are indispensable to the healthcare system and their well-being and work performance has a considerable effect on the quality of hospital healthcare. Nursing is invariably considered a stressful occupation within the healthcare system, and nurses experience a variety of occupational stressors

Being in the medical field, nurses are faced with heavier pressure and psychological stressors and medical practice. They are at a higher risk for depression as other professions in the same field (Ibrahim, Kelly, Adams, & Glazebrook, 2013). Nurses are likely to come up with occupational stress and the ambiguities of the profession, who most directly and frequently interact with patients and affect those patients by their behavior and attitudes. Therefore, their wellbeing cannot be taken lightly. Some studies have indicated that depression may decrease the function of nurses and disturbs the nurse-patient's relationship (Uras, Gennaro, Aparo, & Tabolli, 2012).

Depression among nurses has attracted great attention from hospital and society. There are limited studies on depression regarding prevalence and correlates among nurses in Kenya.

Data revealing specific socio-demographic factors associated with the manifestation of depressive symptoms among nurses may be useful in identifying the symptoms. Moreover, targeted interventions may be formed in order to assist in both early identification as well as address the specific characteristics.

Additionally, studies found that there was an association between stress and the physical wellbeing factors: feeling tired easily, getting nervous, poor sleep and chest tightness, loss of appetite, reduced or increased psychomotor speed and weight changes (Decker, 1997).

In Kenya, there is limited evidence relating to mental health problems among nurses. There are no reported studies that investigate the relationship between stress, anxiety and depression among nurses, and researchers have paid little attention toward factors associated with mental health problems. Therefore, the findings of this study could be used in nursing profession and counselling activities. Owing to a paucity of data, this study aimed to examine the relationship between depression and socio demographic characteristics.

Research Methodology

This study applied a cross-sectional research design. The design involved the collection of data at one point in time. Phenomena under study are captured during one period of data collection. This design is

appropriate for describing the status of phenomena or for describing relationships among phenomena at a fixed point in time. One can test the hypothesis, using cross-sectional data (Mugenda & Mugenda, 2003).

Cross-sectional data can most appropriately be used to infer time sequence under two circumstances; when there is evidence or logical reasoning indicating that one variable preceded the other and when a strong theoretical framework guides the analysis. Cross-sectional studies can also be used to infer about processes evolving over time. Cross-sectional studies are easy to do and are relatively economical (ibid).

The study was conducted at Moi Teaching and Referral Hospital which is located in Eldoret town, 310 kilometers Northwest of Nairobi. Nurses working at Moi Teaching and Referral Hospital constituted the study population. The number of nurses working in this hospital is 1050. These nurses work in various departments in the hospital. Both male and female nurses are employed by the hospital and they work on different shifts. The male nurses are 164 and females are 886.

Beck's Depression inventory (BDI-II) was used to collect data on the dependent variable. The Beck's Depression Inventory (BDI) is a 21-item; self-report rating inventory that measures characteristic attitudes and symptoms of depression (Aaron T Beck, 1967).

A score of 1-10 is considered normal, 11-16 is mild mood disturbance, 17-20 is borderline clinical depression, 21-30 is moderate depression, 31-40 is severe depression and over 40 is extreme depression. A persistent score of 17 or above indicates that one may require medical treatment. A structured questionnaire incorporating socio demographic was used to harvest data on study participants. Socio-demographic characteristics included age, gender, marital status, level of education and religion. The STATA statistical software was used to analyze the data. Descriptive statistics was used to summarize the data. Bivariate and multivariate statistics was applied to examine relationships between the independent and dependent variables. The findings were presented using tables.

Background characteristics	Total		Females		Males	
	N	%	n	%	N	%
Age (years)						
20-29 years	71	25.36%	42	22.11%	29	32.22%
30- 39years	143	51.07%	96	50.53%	47	52.22%
40 – 49years	45	16.07%	33	17.37%	12	13.33%
>50years	21	7.5%	19	10.00%	02	2.22%
Total	280	100%	190	100%	90	100%
Education						
Certificate	40	14.34%	27	14.21%	13	14.61%
Diploma	170	60.93%	112	58.95%	58	65.17%
Degree	64	22.94%	48	25.26%	16	17.98%
Masters	5	1.79%	3	1.58%	2	2.25%
Total	279	100%	190	100%	89	100%
Marital status						
Married	205	73.21%	140	73.68%	65	72.22%
Widowed	11	3.93%	11	5.79%	0	0%
Single	61	21.79%	36	18.95%	25	27.78%
Divorced/separated	3	1.07%	3	1.58%	0	0%
Total	280	100%	190	100%	90	100%

Table 1: Distribution of Nurses by their background characteristics.

Results

The distribution of respondents by age was displayed in Table 1. From the results, it was observed that the majority 143 (51.07%) of the respondents were aged 30-39 and 71 (25.36%) of the respondents were aged 20-29 years. Less than a quarter of the respondents, 45(16.07%) were aged 40-49 years while only 21(7.5%) of the respondents were aged above 50 years. This meant that the study was not biased in terms of age representation of its sample population that was key for this study. The findings further revealed that, more than half 170 (60.93%) of the respondents had diploma level

of education, slightly less than a quarter, 64(22.94%) of the respondents had attained degree level of education, 40(14.34%) of the respondent had attained certificate level of education while only 5(1.79%) had attained masters level.

Seven in ten 205 (73.68%) of the respondents were married, 11(3.93%) of the respondents were widowed, 61(21.79%) of the respondents were single while only 3(1.58%) of the respondents were divorced or separated. By gender there was no big difference in the proportion for those who are married, single and divorced.

Variable	Frequency	Depression levels (%)					
	(n)	Normal	Mild mood disturbance	Borderline	Moderate	Severe	Extreme
Gender							
Females	190	14	11	34	37	3	1
Males	90	69	16	10	6	0	0
Total	280			56			
			$\chi^2= 99.8421$	P = 0.000			
Age group							
20-29	71	6	12	23	58	1	0
30-39	143	10	14	30	43	1	8
40-49	46	63	24	7	4	2	0
>50	21	57	24	5	5	5	5
				66			
Total	281						
			$\chi^2= 78.3350$	P =0.015			
Religion							
Christian	271	32	13	26	27	2	1
Muslim	7	29	0	57	14	0	0
Atheist	3	33	0	0	67	0	0
Total	281			56			
			$\chi^2= 7.0770$	P =0.718			
Marital status							
Married	206	50	33	6	11	0	0
Widowed	11	9	9	36	36	9	0
Single	61	10	7	34	48	0	2
Divorced/ separated	3	0	0	0	33	33	33
Total	281			35			
			$\chi^2=56.8865$	P = 0.007			

Table 2: Depression levels of Respondents by socio-demographic characteristics.

Table 2 shows the prevalence of depression to be 56%. This implies that 5 in 10 of the respondents exhibited symptoms of depression. Otherwise there was significant relationship between gender and depression levels status ($P < 0.000$, $\chi^2 = 99.8421$). The results of the comparison of depression levels by age showed that the proportion of depression was decreasing by age but for the ages below 39 years of

age, the results showed a higher depression rate compared to the older ages. The overall prevalence of depression by age stood at 66%. The explanation for this was that most of the nurses' staff above 40 years were used to their work compared to the younger nurses. The differences among depression by age was statistically significant ($P < 0.015$, $\chi^2 = 78.3350$).

Table 2 also showed that there was no significant relationship between religion and depression ($p < 0.718$, $\chi^2 = 7.0770$). However, this study registered a high depression prevalence of 56%, attributable to more than 96% of the respondents being Christian and 2.5% being Muslim, while only 1.5% were atheist

A cross tabulation of marital status and the level of depression indicated that more of those who experienced symptoms for depression were widowed, single, divorced and separated, making marriage a protective factor against depression among nurses in Kenya. There was a statistically significant relationship between marital status and depression level ($p < 0.007$, $\chi^2 = 56.8865$).

Variables		Depression levels (%)					
	Freq (n)	Normal	Mild mood disturbance	Borderline	Moderate	Severe	Extreme
Educational level							
Certificate	40	5	3	28	63	3	0
Diploma	171	34	12	26	25	2	1
Degree	64	44	38	9	8	2	0
Masters	5	40	20	20	20	0	0
Total	280			51			
			$\chi^2 = 69.8226$	$P = 0.002$			

Table 3: Educational level and depression.

Table 3 shows that the prevalence of depression level in relation to the level of education in this study was at 51%. The study further showed that a higher level of depression was noted among lower levels of education at certificate and diploma levels. This study also showed a statistically significant relationship between the lower level of education and depression ($p < 0.002$, $\chi^2 = 69.8226$).

Discussion

Table 2 shows the prevalence of depression to be 56%. This implies that 5 in 10 of the respondents exhibited symptoms of depression. Otherwise there was significant relationship between gender and depression levels status ($P < 0.000$, $\chi^2 = 99.8421$). These findings were at variance with those of Maslach who revealed that since the Nightingale era, nursing had been seen as a predominantly women's work, and therefore, males who found themselves in the field went through a lot of stress (Maslach, Schaufeli, & Leiter, 2001). Further, Jinks & Bradley, (2004; Genua (2005); Grady *et al.*, (2008) also reported that when males chose a traditionally female occupation, they had a tendency of experiencing role conflict. Men were less satisfied at nursing than women (Lambert & Lambert, 2001;

Sochalski, 2002) and male nurses had greater turnover intentions than their female counterparts. However, a recent study by Vahedi, (2009), on depression among nurses at the universities of medical sciences affiliated hospitals, it was discovered that depression occurred in approximately 25% of women. The study also showed that there was significant relationship between sex and the level of depression, implying that women were more susceptible to depression than men.

The results of the comparison of depression levels by age showed that the proportion of depression was decreasing by age but for the ages below 39 years of age, the results showed a higher depression rate compared to the older ages. The overall prevalence of depression by age stood at 66%. The explanation for this was that most of the nurses' staff above 40 years were used to their work compared to the younger nurses. The differences among the diabetics by age was statistically significant ($P < 0.015$, $\chi^2 = 78.3350$).

The findings were concurrent with those of Mostafa, et al (2013) who found out that the highest

prevalence rate of probable clinical cases of anxiety (23%) was reported among the age group 20 to less than 30 years, while the highest prevalence level of probable clinical cases of depression (10.9%) was reported among the age group 30-40 years among the nurses.

Table 2 showed that there was no significant relationship between religion and depression ($p < 0.718$, $\chi^2 = 7.0770$). However, this study registered a high depression prevalence of 56%, attributable to more than 96% of the respondents being Christian and 2.5% being Muslim, while only 1.5% were atheist

A cross tabulation of marital status and the level of depression indicated that more of those who experienced symptoms for depression were widowed, single, divorced and separated, making marriage a protective factor against depression among nurses in Kenya. There was a statistical significant relationship between marital status and depression level ($p < 0.007$, $\chi^2 = 56.8865$). This was concurrent with the findings of Kaplan (2001) who documented that depression was observed more among the divorced and those lacking inter personal relationship. Moreover Asad (2011) revealed that single and employed women were more likely to develop depression than married employed women. It can be stated that in this regard that social support, including family relations diversely affected the stress rates and married nurses experienced depression considerably lower than the unmarried because they enjoyed higher level of support from their families

Table 3 shows that the prevalence of depression level in relation to the level of education in this study was at 51%. The study further showed that a higher level of depression was noted among lower levels of education at certificate and diploma levels. This study also showed a statistically significant relationship between the lower level of education and depression ($p < 0.002$, $\chi^2 = 69.8226$).

Conclusion and Recommendations

In conclusion, the study revealed that there was a strong relationship between socio-demographic factors and depression among nurses working at

Moi Teaching and Referral Hospital

In socio-demographic factors, gender, age and marital status of the respondents showed a strong statistical relationship between these factors and depression.

Basing on the study findings, the following recommendations were made:

1. Continuous mentorship to the young nurses' on best practices in handling their services.
2. The management should introduce Continuous Medical Education (CMEs) sessions to address the gaps identified in the long run this will be able to bring the young nurses up to speed with their work and improve performance.
3. Formulation of policies that will help prevent depression among nurses working at the hospital this will then improve service delivery and patients' wellbeing.

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Development of Novel Strategies in Management and Prevention of Psoriatic Disease Exacerbation

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Abstract

Introduction: The primary choice of topical corticosteroids in the treatment of the progressive stage of psoriasis is due to their pronounced anti-inflammatory, anti-spasmodic, anti-proliferative, anti-allergic and immunosuppressive effects. The usage of topical corticosteroids have a complex effect on different pathogenetic parts of psoriasis which needs more interpretation.

Aim: The purpose of our work was to identify effective methods for the prevention and treatment of psoriatic patients.

Methods and materials: We included 65 patients with psoriasis aged 45 to 64 years in the study. The control group consisted of 40 healthy individuals of similar age. Patients with psoriasis were divided into 2 groups. The first group (28 people) received basic treatment of the disease approved by the Ministry of Health of Ukraine, using the topical treatment with corticosteroids and third class activity drugs. The second group (37 patients) received similar basic treatment, but as a means of external therapy - clobetasol propionate. Assessment of quality of life in patients with psoriasis generally conducted by questionnaire DLQI. We used ukrainian version of the PASI index.

Results: We evaluated the severity of psoriasis in patients. Thus, in patients examined at baseline PASI index averaged $17,1 \pm 0,71$ points, and the index was BSA $22,1 \pm 1,88\%$. Scoring change in the nail plate before treatment averaged $0,25 \pm 0,03$ points, and scoring excoriation was $0,34 \pm 0,08$ points. In addition, patients with psoriasis skin itch intensity was assessed a 10-point visual analogue scale. On average, they estimated itching to $4,48 \pm 0,51$ points.

Conclusions: These data suggest a significant positive effect on the use of topical corticosteroid clobetasol propionate how to reduce the clinical manifestations of psoriasis and indirectly to improve the quality of life, reduce anxiety, depression and neurotic patients.

Key Words

Psoriatic Disease; Prevention; Treatment; Topical Corticosteroids; Quality of Life

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Introduction

To date, psoriasis is one of the most urgent medical and social problems. The consequence of the disease on psoriasis is a significant decline in the quality of life, disability and disability of the patients, difficulties in creating a family and worsening family relationships, significant psychological discomfort.

The prevalence of psoriatic disease in the population is rather high and, according to various authors¹, is 0.1 to 3% of the world's population. In the general structure of morbidity with dermatological diseases, the specific weight of patients with psoriasis is 8-15%, and among stationary patients, the skin sections of dispensaries - from 7 to 22%^{2,3}. In Ukraine, in recent years, there has been an increase in the incidence of psoriasis. Also increases the number of patients with severe

disabling forms of psoriatic disease, resistant to various methods of therapy^{4,5}. This is due to many factors, including urbanisation and negative environmental impact, especially among inhabitants of large industrial cities, environmental or social disadvantages (chronic stress), the widespread use of chemical products by man, xenobiotics, malnutrition^{6,7,8}. At the same time, the pace of man-made changes in the biosphere is ahead of the adaptive capacity of the human body and require more and more strain of adaptive mechanisms.

There are numerous theories of psoriasis, but none of them can be the only cause. The main theories of the emergence and development of psoriatic disease are: genetic, neurogenic, infectious, parasitic, viral, endocrine-metabolic and others. However, the emergence and progression of psoriatic disease play

a role and many other trigger factors, most of which require appropriate research to further develop measures to control psoriasis.

To date, there are many classifications of psoriatic disease, depending on clinical manifestations, course, degree of severity of the disease. Allocate plaque and non-stick forms of psoriasis, as well as out-of-skin forms of psoriatic disease. To plaque forms include vulgar, inverse, exudative, intertriginous psoriasis, psoriasis of the scalp, psoriasis of palms and soles. Non-block forms of psoriasis include droopy psoriasis, follicular psoriasis, psoriatic erythroderma, pustular psoriasis. Psoriatic arthritis, nail psoriasis, lesions of the mucous membranes, and internal organs form out-of-skin forms of psoriatic disease.

Each of the forms and stages of psoriatic disease requires a certain treatment tactic, which will lead to regression of rash and without any systemic and local side effects. Standard treatment for psoriasis is approved by the Order of the Ministry of Health of Ukraine dated May 8, 2009, No. 330 "On Approval of Clinical Protocols for the Provision of Medical Aid to Patients with Dermatovenereological Diseases" and includes diet No.15, sedatives, anti-stress adaptogens, tranquilizers (if necessary), detoxification agents, vegetotropic (25% magnesium sulfate), hyposensibilizing drugs (sodium thiosulfate, calcium gluconate, magnesium sulfate), antihistamines, drugs that improve peripheral blood Big hepatoprotectors, vitamins (A, E, C, B), non-specific stimulant therapy, physical therapy measures, in severe cases - cytostatics and Immunosuppressants⁹. External treatment of psoriatic rashes is, first of all, in applying to the affected areas of skin topical corticosteroids, in some cases, in combination with keratolytics. Subsequent topical therapy includes the use of indifferent creams (for example, Delaskin cream) or preparations containing keratolytic agents, namely urea 10-12% (for example, ureotope ointment).

The primary choice of topical corticosteroids in the treatment of the progressive stage of psoriasis is due to their pronounced anti-inflammatory, anti-spasmodic, anti proliferative, anti-allergic and immunosuppressive effects. Thus, proving that the topical corticosteroids have a complex effect on different pathogenetic parts of psoriasis. The mechanism of anti-inflammatory, anti-proliferative and immunomodulatory action for all corticosteroids (according to generally accepted ideas) in the schematic simplified form can be represented as follows: corticosteroid molecules form complexes with corticosteroid receptors of cells - bind to separate genes of hormone-reflexive elements. This induces the transcription of specific

m-RNA molecules that take part in the synthesis of lipocortin-proteins on ribosomes. Lipocortins inhibit reactions that arise in the case of physical, chemical, toxic, immunogenic effects or microbiological pathogen exposure that occur between phospholipase A2 and phospholipids and provide release of arachidonic acid. Delay or inhibition of the process of release of arachidonic acid normalises, reduces or blocks the release of prostaglandins, leukotrienes, FAT and thromboxanes, which act as inflammatory mediators on vessels, leukocytes, macrophages, their chemotaxis, and migration^{10,11}.

One of the important effects of topical corticosteroids is the increased binding of histamine and serotonin to the skin and a decrease in the sensitivity of nerve endings to neuropeptides and histamine. In addition, corticosteroids have anti-mitotic effects and inhibit the synthesis of nucleic acid and protein, suppressing the proliferation of the epidermis and stabilising parakeratosis. Topical corticosteroids also inhibit collagen synthesis and proliferation of fibroblasts, stabilise membranes of migrating immunocompetent cells, tissue basophils and endothelium, suppress the migration of eosinophils and proliferation of T-lymphocytes.

According to the European classification of topical corticosteroid activity, the first proposed by J. A. Miller, D. D. Munro, there are four classes of topical corticosteroids: I with the lowest activity, IV with the highest activity. In this case, one of the main principles of topical corticosteroid therapy is to favour the short-term use of strong topical corticosteroids before prolonged use of weak topical corticosteroids of the 1st and 2nd grade. In addition, it is best to prescribe long-acting drugs that can be used once a day, which will increase compliance and, accordingly, the effectiveness of therapy. Thus, the most suitable for use in patients with psoriatic disease is a topical corticosteroid of the IV class - clobetasol propionate.

However, it should be kept in mind that the effectiveness of the treatment of steroid susceptible dermatoses depends not only on the choice of the optimal active ingredient, but also on the use of the appropriate form of drug release according to the clinical picture of the disease. After all, the choice of inappropriate form of the drug may lead to ineffective therapy and possible side effects. The depth of penetration of topical corticosteroids is maximal when applied in the form of ointments, much less - in the form of a cream and completely insignificant in the form of a solution. According to the basic principles of therapy with topical corticosteroids, in the chronic course of psoriasis, it is recommended to give preference to ointment

forms, with acute inflammatory process - creams, for application on the scalp of the head - to solutions.

Unfortunately, most manufacturers of topical corticosteroids prefer to release one to two main forms of the drug (most often it is a cream and ointment), without taking into account the needs of persons with severe course of chronic dermatoses (with pronounced lichenification, dryness, peeling of the skin), and also those with defeat the hair part of the head (Figures 1, 2).



Figure 1: Patient K. plaque form of psoriasis

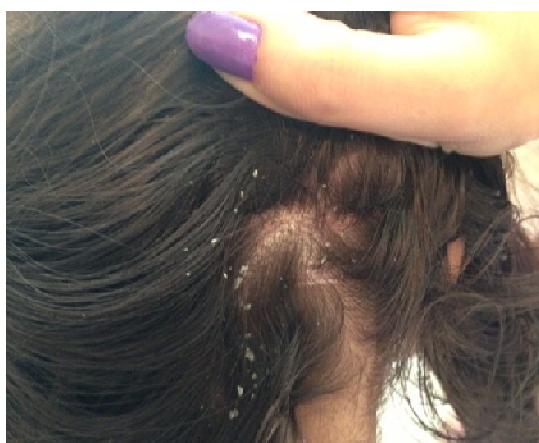


Figure 2: Patient S. psoriasis of the scalp

Consequently, the topical corticosteroid, which is represented by a full spectrum of forms of release necessary for clinical practice - solution, cream, ointment, oily ointment, is of great benefit. The presence of these forms of the drug clobetasol propionate provides the opportunity to choose at

different stages of the inflammation process and damage to various areas of the skin.

However, given that clobetasol propionate is the topical corticosteroid with the highest activity, it should adhere to the established rules and doses when applied:

1. clobetasol propionate should be applied once a day, with a thin layer;
2. the total area of application should not exceed 20% of the entire surface of the body;
3. the course of treatment is no more than 2-3 weeks.

Compliance with these rules will prevent possible side effects and provide high effectiveness of therapy for psoriasis and other steroid-sensitive dermatoses.

However, psoriasis is a chronic recurring disease that requires not only an adequate clinical picture of systemic and topical treatment, but also the use of certain preventive measures. To date, the basic etiological factors and pathogenetic links of psoriatic disease have been investigated. However, insufficient attention is paid to the risk factors of exacerbations of psoriasis and the possibility of avoiding them.

Aim

The purpose of our work was to identify effective methods for the prevention and treatment of psoriatic patients.

Materials and Methods

We included 65 patients with psoriasis aged 45 to 64 years in the study. The control group consisted of 40 healthy individuals of similar age. Patients with psoriasis were divided into 2 groups of therapeutics:

The first group (28 people) received basic treatment of the disease which was approved by the Ministry of Health of Ukraine using the topical treatment with corticosteroids and third-class activity drugs;

The second group (37 patients) received similar basic treatment, but as a means of external therapy - clobetasol propionate. If a large number of dense layers of dry scales on the surface of the "old" psoriatic plaques (Figure 3) on the affected skin, ointment clobetasol propionate was applied. The presence of typical psoriatic plaques with signs of moderate or severe infiltration and silvery white peeling (Figure 4) was the indication for clobetasol propionate ointment. In acute inflammation with lesser signs of infiltration and peeling of the skin (Figure 5) clobetasol propionate cream was used. In the presence of psoriatic lesions of the scalp (Figure



Figure 3: Patient B. plaque form of psoriasis, and, a- before treatment, b- after the topical treatment of psoriatic lesions on the upper extremities oily ointment Clobetasol propionate.



Figure 4: Patient A. plaque form of psoriasis: a - before treatment, b - after topical treatment of psoriatic lesions on the back ointment Clobetasol propionate.



Figure 5: Patient N. Nummular form of psoriasis: a - before treatment, b - after topical treatment of psoriatic lesions on the trunk cream Clobetasol propionate.



Figure 6: Patient S. scalp psoriasis: a - before treatment, b - after external treatment solution clobetasol propionate.

6) clobetasol propionate solution was used. The drug regardless of its form, it was used 1 time per day, a thin layer was applied. The term use defined individually depending on clinical disease and its changes in the dynamics of treatment, did not exceed 20 days.

The patients were assessed on the severity of psoriasis. We evaluated the prevalence of psoriatic process in a standardised index BSA, which determines the percentage of affected psoriasis body surface and install the seriousness of psoriatic disease index PASI, which determines the severity (erythema, infiltration and desquamation) and the affected area individually in 4 zones (head and neck, upper limbs, trunk, lower limbs)¹³. PASI index changes during treatment is an objective indicator of the results of therapy. Therefore, to assess the

effectiveness of our proposed treatment of psoriasis defined percentage reduction index PASI (Δ PASI.%), Δ PASI-50 (which corresponds to a reduction of the index PASI 50%).

Assessment of the severity of itching skin held a ten visual analogue scale where 0 points - a total absence of itching, and 10 points - its maximum intensity. In addition, an assessment was objective evidence that itch like excoriation and nail plate changes (their polished surfaces, thinning of the free edge). Each objective evidence of pruritus was assessed us point scale, where 0 points - the lack of signs, 1 point - its weak expression, 2 points - moderate severity, 3 points - a significant expression.

In order to establish mental characteristics and

psychological state of patients with psoriasis, we have conducted a survey using standardised questionnaires and developed personally. We have developed a questionnaire containing questions about education, social status, presence of occupational hazards, stress at work, smoking cigarettes, drinking alcohol, marital status, psychological climate in the family, living conditions, the average income for a family member, dietary habits (consumption of milk and dairy products, fish and seafood, meat and meat products, fruits and vegetables, pasta and potatoes), vitamins, self-assessment of health status, care about their health.

Assessment of quality of life in patients with psoriasis generally conducted by questionnaire DLQI. Changes index DLQI the treatment is an objective indicator of the results of therapy. Therefore, to assess the effectiveness of treatment of psoriatic disease defined percentage reduction index DLQI (Δ DLQI,%)¹⁴.

Changes in mental status was showed in men using the questionnaires. The level of anxiety was studied on a scale self Spielberger-Hanin. This test is a reliable and informative method of self-assessment of situational (reactive) anxiety (anxiety in a given time)^{15, 16}. The results measured in points.

The level of neuroticism assessed by the method of diagnosing L. Wassermann. For the purpose of scoring neuroticism, 40 judgments and situations were provided and studied how patients responded to them positively or negatively. After that interpretation of neuroticism levels were made. High levels of neuroticism indicate a strong emotional excitability. Low levels of neuroticism, by contrast, speaks of emotional stability, positive feelings background (calm, optimism), as well as initiative, independence, a sense of dignity and ease in communication¹⁷.

In addition, the survey was conducted using a questionnaire "Beck Scale for severity of depression, self-esteem," which consisted of 21 groups allegations¹⁶. Each group had to choose the one that best reflected the health of the person included in the study. This made it possible to identify states sub-depression and depression in patients. Also it is important to assess how cognition is affective with the somatic component of depression due to two sub scales of Beck.

All the received data in the work was processed statistically. In order to compare the indicators in the groups for recovery and after healing, Student-t test or the criterion of Wilcoxon's signed rank

test depending on the normality of the distribution of the differences in the SPSS software were applied. Normality of data distribution was verified using the Shapiro-Wilk criterion at the significance level of 0.01. In the application of all statistical methods, in addition to the Shapiro-Wilk criterion, the significance level was taken to be $P < 0.05$.

Results

Through the survey we found that among patients, those with psoriasis had a greater number of people who believe their relationship in the family poor and noted the adverse psychological climate in the family. If healthy individuals psychological climate in the family considered unfavourable 16.3% of respondents, among patients with psoriasis, this percentage is 21.9% of cases. Frequent stress at work were more predominantly in patients with psoriasis (at 39.4%) compared with the group of healthy persons (26.5%).

Patients with psoriasis are more likely than in the population as a whole met habits. For example, among patients with psoriasis 50.1% smoked cigarettes, and among healthy individuals 41.4% were smokers. A similar trend was noted and other bad habits - drinking alcohol. Among patients with psoriasis 26.6% weekly or more frequently consumed alcohol. At the same time among healthy individuals 18.3% compared often used alcohol.

We also paid attention to healthy eating habits in people with psoriasis. As a result, the survey found that patients with psoriasis are rarely consumed dairy products. Thus, only 18.6% of patients consumed dairy products more than 2 days a week. Among healthy individuals percentage of persons for more than 2 days per week consumed dairy products amounted to 25.2%. Most patients with psoriasis rarely ate fish and seafood - 72.1% ate fish and seafood only 1-2 days per week or no take. The percentage of persons who are 5-7 days per week ate fish and seafood among patients with psoriasis was low at 5.1%. In patients with psoriasis also experienced the lowest percentage of people who 5-7 days a week, ate meat and meat products - 16.3%. Less than 3 days a week meat and meat products consumed 31.9% of patients with psoriasis and 22.1% of healthy individuals. It should be emphasised that patients with psoriasis had insufficient food and use fruits and vegetables. Fruits and vegetables were consumed by 29.7% of healthy people and only 20.1% of patients with psoriasis for 5-7 days a week; 58.4% of patients 5-7 days per week ate pasta and potatoes. Infrequent eating of pasta and potatoes (1-2 times per week or complete rejection of them) were reported in 9.6%

of healthy people and only 2.1% of patients with psoriasis. While questioning can not be too careful to characterise the nutritional status, but traced a clear trend towards imbalance in receipt of food ingredients with a prevalence of receipt of carbohydrates and not enough protein and vitamins use in patients with psoriasis.

An interesting fact was that despite their health, more than half of patients with psoriasis only occasionally takes care of their health. Constant care about their health shows only 18.7% of patients. The percentage of people who do not care about their health status among patients with psoriasis is 31.3%.

Improper care of their health, lack of nutrition, frequent stress at work and the adverse psychological climate in the family and habits may contribute to the development of psoriatic disease and therefore can be considered as possible risk factors of psoriasis. That is why they need to conduct appropriate correction - changes in lifestyle, smoking cessation cigarettes and drinking alcohol, move to a balanced diet, eating vitamins (especially, biotin and Dexpanthenol) avoidance of stress or psychological training to improve stress resistance.

We evaluated the severity of psoriasis patients. Thus, in patients examined at baseline PASI index averaged $17,1 \pm 0,71$ points, and the index was BSA $22,1 \pm 1,88\%$.

Unlike healthy people, some patients with psoriasis in clinical examination were found with objective evidence itching, excoriation such as nail plate and change (their polished surfaces, thinning of the free edge). Scoring changes in the nail plate before treatment averaged $0,25 \pm 0,03$ points, and excoriation score was $0,34 \pm 0,08$ points. In addition, patients with psoriasis skin itch intensity was assessed a 10-point visual analogue scale. On average, they estimated itching to $4,48 \pm 0,51$ points.

The deterioration of the skin in general, the presence of pathological lesions on the skin, subjective evidence of disease in the form of itching leads to reduced quality of life in patients with psoriasis. This caused the growth in the DLQI index. On average DLQI index in patients with psoriasis before treatment was $12,2 \pm 0,24$ points.

In the study, we also paid great attention to the definition of psychological features of patients with psoriasis. Our results are given in Table. 1. As the table shows, the average value of the integral index

Indexes:	The control group	Patients before Treatment	Patients after treatment:	
			First group	The second group (using clobetasol propionate)
The level of situational anxiety on a scale Spielberger-Hanin, points	$40,2 \pm 0,21$	$46,1 \pm 0,33\Delta$	$45,7 \pm 0,5$	$45,2 \pm 0,2 * \notin$
The level of neuroticism by Wassermann, points	$5,58 \pm 0,23$	$13,9 \pm 0,31\Delta$	$12,6 \pm 0,42$	$11,9 \pm 0,38 * \notin$
The level of depression on the Beck scale, scores	$6,23 \pm 0,32$	$11,5 \pm 0,29\Delta$	$10,1 \pm 0,51$	$9,97 \pm 0,30 *$

Table 1: Levels of situational anxiety, depression and neuroticism in the dynamics of treatment

Notes: Δ - significant difference ($P < 0.05$) when compared to the corresponding rates in patients with psoriasis to treatment and control groups; * - significant difference ($P < 0.05$) when compared with those of a group of patients to treatment; \notin - significant difference ($P < 0.05$) when compared with those of patients in the first group after treatment.

of situational anxiety in patients with psoriasis consistent high level of anxiety due to the high situational stress, concern, anxiety. Thus, patients with psoriasis are inadequately responsive to environmental factors, resulting in mental stress and changes in the nervous system and, in turn, to the persistence and recurrence of the disease.

Discussions:

In patients with psoriasis, we observed significantly higher levels of neuroticism compared with a group of healthy subjects (Table 1). If the integral index of neuroticism L.I.Wassermann for the control group corresponded to a low level, the patients with psoriasis showed moderate neuroticism. This indicates a growth in their emotional excitability, resulting in negative emotions such as anxiety, tension, irritability, confusion. There hypochondriacal fixation on physical sensations and personal shortcomings, including those related to clinical manifestations of psoriasis. This leads to psoriatic disease progression and worsening of quality of life.

In patients with psoriasis also observed significantly higher levels of depression integral index on a scale Beck compared with a group of healthy subjects (Table 1). Healthy patients on an average showed no signs of depression. This score for Beck's scale in patients with psoriasis is regarded as the sub depression consistent state. On one hand, it is the result of chronic psoriasis on the psychological state of the patient, but on the other hand, the presence of sub-depression state by precipitating factors of psoriasis. Thus, there is formation of pathological vicious circle where the presence of psoriasis leads to increased anxiety, neuroticism and depression patient, and this, in turn, is a precipitating factor of the disease.

We analyzed the survey results in patients with psoriasis receiving late treatment. First of all, it should be noted good tolerability solution, cream, ointment and fatty ointment clobetasol propionate. Rate external application of topical corticosteroids does not exceed 20 days, and during that time we have not observed either their local or systemic side effects. Although it should be remembered that prolonged and intensive treatment highly active corticosteroids can lead to increased surface blood vessels, thinning of the skin, forming atrophic bands on it, hypertrichosis and other side effects. Thus, the data demonstrate the safety of use in dermatological practice solution, cream, ointment of clobetasol propionate for 20 days.

Through the use of clobetasol propionate there was a fast regression of psoriatic lesions (Figures 3-6). In patients with psoriasis during treatment the area of affected skin, and scoring index PASI were varied. The results of the definition given in the Table. 2. As the table shows, after treatment in patients with both therapeutic groups a significant reduction index BSA, and PASI index compared with the group of patients before treatment that depicts about the improvement of clinical disease, reducing the area of skin lesions regress erythema, infiltration and peeling were noted. It is observed that the index PASI was lower in patients with psoriasis who used various forms of preparation clobetasol propionate, Compared to the therapeutic group of patients. The ΔPASI (%) indicator at the end of treatment was significantly lower in the patients and therapeutic group compared with the group of patients in the treatment of psoriasis using various forms of preparation clobetasol propionate.

In addition, to the patients who were in the treatment for psoriasis using various forms of

Indexes:	Patients before Treatment	Patients after treatment	
		First group	second group (clobetasol propionate)
PASI index	17,1 ± 0,71	11,4 ± 1,1 *	9,3 ± 0,8 *
Δ PASI,%		58,1 ± 3,6	64,9 ± 2,0€
Δ PASI> 50%		60.3	69.1
index BSA,%	22,1 ± 1,88	17,3 ± 1,12 *	14,1 ± 1,36 *

Table 2: Indices PASI and BSA in patients with psoriasis during treatment

Notes: * - significant difference (P <0.05) when compared with those of a group of patients to treatment; € - significant difference (P <0.05) when compared with those of patients in the first group after treatment.

Indexes:	Patients before Treatment	Patients after treatment	
		First group	The second group (using clobetasol propionate)
DLQI index, points	12,2 ± 0,24	9,4 ± 0,29 *	8,6 ± 0,17 *€
ΔDLQI		38,1 ± 1,6	43,6 ± 1,2€

Table 3: Dynamics DLQI index in patients with psoriasis during treatment

Notes: * - significant difference (P <0.05) when compared with those of a group of patients to treatment; € - significant difference (P <0.05) when compared with those of patients in the first group after treatment.

preparation, clobetasol propionate observed a higher percentage of patients who achieved PASI 50 (i.e, where the PASI index fell by 50%) in comparison with the therapeutic group of patients. This indicates a positive clinical effect of the drug clobetasol propionate in the treatment of psoriasis.

In the treatment of the patients with psoriasis (regardless of therapeutic group) a decrease itching of the skin and its objective characteristics - changes in the nail plate and the presence excoriation was noted. We obtained significant difference in scoring itching between the group of patients before treatment and after its completion in both experimental groups. When comparing scores among themselves and severity of itching his objective evidence that patients with different therapeutic groups after treatment we found that patients who used different forms of preparation "clobetasol propionate" end of treatment were lower scoring itching and excoriation compared to And individuals with therapeutic groups.

We also assessed the impact of the use of various forms of preparation "clobetasol propionate" the quality of life of patients with psoriasis. As evident from the table 3, the patients with both therapeutic groups against the background of the treatment DLQI index significantly decreased, indicating improvement in their quality of life, compared with patients before treatment. It should be noted that the index DLQI at the end of treatment was significantly higher in the group of patients and therapeutic, compared with its value in patients in treatment applied different forms of preparation clobetasol propionate. In addition a significant difference for ΔDLQI (%) between the first and second therapeutic groups of patients was established. These data once again underline the efficacy of drugs clobetasol propionate in the treatment of patients with psoriasis.

The rapid improvement of clinical disease and regression of scars on visible parts of the body (including the scalp) against the background external application of topical corticosteroids clobetasol propionate, had a positive impact on the psychological state of patients. The results are presented in Table. 1. As it is evident from the obtained data, the use of clobetasol propionate helped reduce levels of situational anxiety, neuroticism and depression. After treatment, patients who used topical corticosteroids (clobetasol propionate) had significantly lower levels of situational anxiety and neuroticism compared not only with patients before treatment, but also therapeutic groups and end of treatment. The level of depression in patients clobetasol propionate used in treatment of psoriasis was significantly lower compared with the group of patients before treatment. These data suggest a significant positive effect on the use of topical corticosteroid clobetasol propionate how to reduce the clinical manifestations of psoriasis and indirectly to improve the quality of life, reduce anxiety, depression and neurotic patients.

Conclusions

Review of current literature and conducted study lead us to the following conclusions:

1. Frequent stress at work and the adverse psychological climate in the family, bad habits (smoking cigarettes and drinking alcohol), lack of nutrition, poor care of their health are possible risk factors for the progression of psoriatic disease.
2. The effectiveness of psoriasis treatment depends not only on the correct choice of systemic therapy and the use of appropriate clinical picture means of external action and their specific dosage forms.
3. The use of topical corticosteroids clobetasol propionate in various forms of release is an effective treatment for psoriasis, which causes rapid

regression of psoriatic lesions, reduction in PASI index and BSA, reduce itching and its objective evidence, and indirectly improves the quality of life, reduction in situational anxiety, depression and neurotic patients.

Ethical committee approval: This study was approved by the local expert committee.

Informed consent: An informed consent was taken from all patients that took part in the study, in absence of contact with the patient, a verbal consent was obtained from the patient/ relatives.

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Conflict of Interest: None to declare.

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The Significance of proANP and NT Pro-BNP Levels Measurement in Patients with Arterial Hypertension.

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Abstract

Introduction: Despite the existence of sufficient information about how to contact progression of AH on the violation of metabolites NP, in particular pro-ANP and NT-pro BNP, the impact of these neuropeptides on the structural- functional state of vessels under the influence of combined anti-hypertensive therapy remains debatable and contradictory.

Aim: The aim of this research is to study the plasma content of pro-ANP and NT pro-BNP and their impact on neuro-humoral auto-regulatory mechanism leading to development of arterial hypertension and stiffness.

Methods and materials: We examined 76 patients with AH I-III stages (43 men and 33 women average age of $46,9 \pm 1,5$ years and duration of the disease $9,1 \pm 1,4$ years). Patients were distributed into groups basing on their degree of hypertension: I stage AH- 16 patients, II stage- 43 and 17 patients with III stage AH. The control group consisted of 22 healthy people comparable with the main group. The systolic blood pressure(SBP), pulse pressure(PP), diastolic blood pressure(DBP), pulse wave velocity (PWV) were measure using the dopplerography (philips "Envisor" frequency 7,5 MHz) on the heart segment of the left radial artery. Statistical processing of the results was carried out using the Statistics 6.0 (StatSoft Inc.).

Results: In the control group, PWV in the BS was 8.14 ± 0.26 m / s, and after muscle work(MW) tended to decrease to 7.68 ± 0.19 m / s ($p > 0.05$), which was 5,7%. Accordingly, on the part of the ABF in the state of rest LLABF was 45.7 ± 3.4 mm Hg, but significantly decreased after MW to 32.3 ± 1.9 mm Hg. Art. ($p < 0,01$), which made up 29,3%. At the same time, ABFR, having formed in the BS was 49.5 ± 3.4 mm Hg and after MW, increased significantly to 58.2 ± 3.0 mm Hg ($p < 0.01$). From the results of proANP and Nt-proBNP metabolites, their plasma content in patients with hypertension was 1598 ± 54 fmol / ml and 445.8 ± 16.9 fmol/ml and 67.9% and 110.7% higher than in the control group (952 ± 51 fmol / ml and 211.6 ± 31.3 fmol / ml, respectively, $p < 0.001$).

Conclusions: In patients with hypertension, an increase in the levels of proANP and NT-pro-BNP in plasma is observed parallel to the increase in arterial hypertension. A close positive correlation was found between the values of proANP, NT-pro-BNP and PWV.

Key Words

Arterial Hypertension; Pulse Wave Velocity; Arterial Stiffness; Natriuretic Peptides.

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Introduction

The generally accepted idea of arterial hypertension (AH) is that, it morphologically restructures (structural remodeling) almost all vessel departments. The important markers of structural damage of the vessels after their remodeling are abnormal thickening in the wall, accompanied by an increase in pulse wave velocity. In addition, structural remodeling of the arterial vessels is closely associated with the mechanism of auto-regulation of blood flow (ABF)^{1, 2}. Arterial hypertension (AH) is accompanied by a violation of the ABF shift range causing the increase in intravascular pressure³. In addition, changes in the

lower limit of the ABF (LLABF) are marked with the smallest size intravascular pressure below which the ABF gets ineffective⁴, increase in which significantly causes the development of hypertensive crisis⁵ and vascular complications¹. on the other hand, an important role in the pathogenesis of AH is played by the neuro-humoral factors. In recent years more attention is paid to the systemic natriuretic peptides (NP)⁶. NP in humans are divided into three peptides – Pro-Atrial Natriuretic peptide (Pro-ANP), Brain Natriuretic Peptide(BNP) and peptide type S. The most significant role in cardiovascular diseases manifestation is played by ANP and BNP levels that are closely correlated with the size, function and

weight of the left ventricle⁷. Anti-hypertensive treatment reduces the structural remodeling of vessels and leads to a lowering of ANP concentration in blood⁸. However, despite the existence of sufficient information about how to contact progression of AH on a violation of metabolites NP, in particular pro-ANP and NT-pro BNP, the impact of these neuropeptides on the structural- functional state of vessels under the influence of combined anti-hypertensive therapy remains debatable and contradictory.

Aim

The purpose and the objectives of this research is to study the plasma content of pro-ANP and NT pro-BNP and their impact on neuro-humoral auto-regulatory mechanism leading to development of arterial hypertension and stiffness.

Materials and methods

We examined 76 patients with AH I-III stages (43 men and 33 women with average age of 46.9 ± 1.5 years and duration of the disease being 9.1 ± 1.4 years). Patients were distributed into groups basing on their degree of hypertension: I stage AH-16 patients, II stage- 43 and 17 patients with III stage AH. The control group consisted of 22 healthy people comparable with the main group. The systolic blood pressure(SBP), pulse pressure(PP), diastolic blood pressure(DBP), pulse wave velocity (PWV) were measure using the dopplerography (philips "Envisor" frequency 7,5 MHz) on the heart segment of the left radial artery. The ABF of the forearm was studied by the tetrapolar rheography method with occlusal breakdown and simultaneous registration of pressure in the occlusion cuff using the computer diagnostic complex "Rheocom", VO HAI-Medica, Kharkiv (Patent for Utility Model No. 36087). The recording of the differential rheoplethysmogram (RPG) of the forearm was carried out when the air compressor was injected into the occlusive cuff on the shoulder at a speed of 10 mm Hg for 2-3 cardiac contractions.

With the increase in occlusion,more distal to the imposed occlusive cuff, the blood pressure decreased, in response to the RPG, according to the mechanism of the ABF, recorded an increase in the amplitude of the rheographic complexes. The following indicators of the ABF were studied:

1. The lower limit of the ABF (LLABF) is the smallest intravascular pressure below which the growth of the RPM amplitude ceased. The intravascular pressure was calculated as the difference between the SAT and the pressure in the cuff according to the formula $LLAR = SBP - P_{max}$, (mm Hg), where P_{max} is the pressure in the occlusion cuff with the maximum increase

in the amplitude of the RPG.

2. The ABF range was measured from the beginning of the increase in the amplitude of the RPG to its maximum recovery by the formula: The ABF range (ABFR) were $P_{max} - R_{poc}$, (mm Hg), where R_{poc} is the pressure in the occlusive cuff at the beginning of increasing the amplitude of the RPG complexes. The ABF and PWV study was performed in the basal state (BS) and after the muscle work (MW) of the forearm in the amount of 70% of the maximum.

The content of proANP and Nt-proBNP in blood plasma was determined by immune enzyme method. According to the design of the study, 29 patients with AH 1-2 are. (13 males and 16 females) received combination therapy with amlodipine at a dose of 5 mg / day with losartan at a dose of 50 mg / day once a day. If during a week the target values of blood pressure were not achieved (SBP <140, DBP <90 mm Hg), hypothiazide 12.5 mg / day was added to the resulted scheme. Duration of treatment was 12 weeks.

Statistical processing of the results was carried out using the Statistics 6.0 (StatSoft Inc.). The significance of the differences between the investigated values was determined by the t-student test, which was considered to be reliable at $p < 0.05$. The degree of interconnection between the pairs of independent signs was evaluated using the P. Spearman rank correlation coefficient.

Results

As the study showed, in the control group, PWV in the BS was 8.14 ± 0.26 m / s, and after MW tended to decrease to 7.68 ± 0.19 m / s ($p > 0.05$), which was 5,7%. Accordingly, on the part of the ABF in the state of rest LLABF was 45.7 ± 3.4 mm Hg, but significantly decreased after MW to 32.3 ± 1.9 mm Hg. Art. ($p < 0,01$), which made up 29,3%. At the same time, ABFR, having formed in the BS was 49.5 ± 3.4 mm Hg and after MW, increased significantly to 58.2 ± 3.0 mm Hg ($p < 0.01$).

Thus, the received data testify that PWV is not a constant value, which essentially influences the functional state of vessels. In healthy people,it was found that there is a decrease in PWV by 5.7% after MW. Along with the expansion of ABFR due to the reduction of LLABF, it says about the decrease of tone (stiffness) of vessels, as a manifestation of adaptation to muscular work.

In the main group (patients with hypertension) the index of PWV in the BS with hypertension was equal to $8,45 \pm 0,31$ m/s and did not differ from such in healthy people, but in groups AH 2 stage

and 3 stage, it has probably increased to 9.08 ± 0.42 ($p < 0.05$) and 10.33 ± 0.50 ($p < 0.02$) m / s, respectively. Similarly LLABF in the BS with AH stage 1 and 2 was 43.4 ± 6.2 and 53.0 ± 5.9 mm Hg respectively, that did not differ significantly from such in healthy people ($p > 0.05$). But in the group AH 3 stage it has risen to 55.3 ± 4.4 mmHg ($p < 0.05$). More significant changes in these indicators were observed after MW.

So, the value of PWV with AH 1 stage was equal to 8.58 ± 0.40 m/s and practically did not differ from the resting state ($p > 0.05$), whereas in the case of AH stage 2, there has been a tendency towards its growth to 9.45 ± 0.42 (an increase of + 4.1%, $p > 0.05$), which exceeded the probabilities for AH 3 stage reaching 11.16 ± 0.50 m/s with an increase of + 8.0%, ($p < 0.05$). Similarly, after MW in groups with AH stage 2 and 3, parameters of LLABF increased significantly to 63.3 ± 7.4 mm Hg and 86.8 ± 9.2 mm Hg ($p < 0.001$), which was an increase of + 18.4% and + 62.7%, respectively. In this case, the absolute value of ABFR in patients with AH stage 1, 2 and 3 remained without probable changes 57.1 ± 4.0 , 62.4 ± 5.0 and 58.5 ± 4.9 mm Hg respectively.

However, comparing the ABFR with the resting index showed a 19.7% reduction compared to an increase of 47.3% in healthy people. Thus, in contrast to the control group, in the group of patients with AH, the progression of hypertension is accompanied by an increase in PWV, in patients with AH stage 1 and 2. Even more significant changes were observed after MW with an increase in the rate (up to 8.0% with AH stage 3). From the results of ABF in the main group, there was a shift of LLABF toward a higher level of blood pressure with a decrease in the ABF range and the restriction of regulatory adaptive vascular mechanisms, which manifested as much as possible in muscle load.

From the results of proANP and Nt-proBNP metabolites, their plasma content in patients with hypertension was 1598 ± 54 fmol / ml and 445.8 ± 16.9 fmol/ml and 67.9% and 110.7% higher than in the control group (952 ± 51 fmol / ml and 211.6 ± 31.3 fmol / ml, respectively, $p < 0.001$). An analysis of proANP and NT-pro-BNP values in patients with AH depending on the degree of hypertension, showed a significant increase in the level of peptides in parallel with the growth of arterial pressure. Thus, the difference between the indicators in the control group and the groups with AH stage 1, 2 and 3 for proANP 22.0%, 69.2% and 98.6% respectively, and for NT-pro-BNP were 39.4%, 118.2% and 158.0% respectively. The obtained data indicate a significant activation of the NP system with an increase in the content of proANP and NT-

pro-BNP in blood plasma parallel to the increase in hypertension.

Subsequently, in order to determine the relationship between proANP and NT-pro-BNP values with violations of ABF and stiffness of the muscular type arteries, in the group of patients with hypertensive disease in general, the rank correlations of P. Spearman were studied. In patients with AH in the BS, a weak positive relationship was observed between proANP and NT-pro-BNP with SFX ($r = + 0.34$ and $r = + 0.34$, respectively, $p < 0.05$), the degree of which after MW increased significantly ($r = + 0.56$ and $r = + 0.61$ respectively, $p < 0.02$). Similarly, in the resting state, there was no relationship between the values of proANP and NT-pro-BNP from LLABF and ABFR, but after MW there was a close relationship between these indices. In LLABF difference between proANP and NT-pro-BNP was $r = + 0.47$ and $r = + 0.54$ ($p < 0.05$) respectively, and ABFR proANP and Nt-pro-BNP was $r = + 0.53$ and $r = + 0.58$ respectively ($p < 0.01$).

Discussions

The results of 12 weeks study of treatment with the combination of amlodipine and losartan showed that in patients with hypertension, a significant decline in SBP from 157.8 ± 4.2 mmHg to 134.9 ± 2.3 mmHg was noted. (by-16.2%, $p < 0.01$), DBP 95.2 ± 2.3 mm to 83.8 ± 1.8 mm Hg (-11.9%; $p < 0.05$) and PP 63.6 ± 1.6 mmHg to 49.1 ± 1.4 mmHg. (-22.8%; $p < 0.001$). At the same time, LLABF with a respectable decrease of 91.4 ± 2.0 mm Hg was found to 71.4 ± 1.4 mm Hg (-21.9%; $p < 0.001$), which occurred in parallel to positive changes in the structural and functional state of vessels. Thus, PWV in the BS tended to decrease from 9.45 ± 0.61 m / s to 8.54 ± 0.45 m / s (-9.6%, $p > 0.05$), but after the MW, PWV decreased (by -2.4%; $p > 0.05$). Also, the levels of proANP and NT-pro-BNP were reduced by 43% and 76%, respectively, $p < 0.01$.

Therefore, the study has shown that the progression of hypertensive disease is accompanied by a disruption of the metabolites pro-ANP and NT-pro-BNP, whose content increased parallelly with the increase of hypertension. At the same time, a close positive correlation was found between the values of proANP and NT-pro-BNP with PWV and ABF indicators, which was substantially influenced by a functional test with physical activity. It should be recalled that representatives of natriuretic peptides, which include proANP and NT-pro-BNP metabolites, are referred as the depressors of the regulatory system of arterial pressure. It is found that the increase in the magnitude of NT-pro-BNP in patients with AH,

in fact, is a marker of structural and functional changes not only from the heart, but also from the peripheral arteries of the muscular type. Significantly, the positive relationship between NT-pro-BNP and ABF and its growth after muscular work has been revealed. This proves the prognostic role of the peptides studied in the sense of possible functional vascular disorders in the unfavorable course of AH.

Conclusion

1. The PWV index is a constant value, and it is substantially affected by the functional state of the vessels. The progression of hypertension is accompanied by an increase in it and is effected by a shift in the range of auto regulation causing higher levels of intravascular pressure and a decrease in range of auto-regulation, which manifests itself as much as possible after muscle load.
2. In patients with hypertension, an increase in the levels of proANP and NT-pro-BNP in plasma plasma is observed parallel to the increase in arterial hypertension. A close positive correlation was found between the values of proANP, NT-pro-BNP and PWV and the violation of the forearm blood flow auto regulation, which increased after muscular loading, makes it possible to talk about the high sensitivity of the peptide as a marker of lesions of the muscular type arteries.
3. A 12-week hypertensive treatment with amlodipine 5 mg/day and losartan 50 mg/day in patients with arterial hypertension significantly improved the mechanisms of auto-regulation and elastic properties of muscular vessels while reducing the levels of proANP and NT-pro-BNP in plasma.
4. The application of functional tests with muscle loading and determination of the level of metabolites of natriuretic peptides proANP and NT-pro-BNP allows a more accurate assessment of the degree of structural and functional lesions of muscular arteries against hypertension.

Conflicts of Interest: None declared by the authors.

Informed consent and ethical committee approval: An informed consent was taken from the patients for their participation in this study and a local ethics committee permission was also obtained.

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Challenges Faced in Implementing SPICES Model at Moi University College of Health Sciences, Eldoret, Kenya

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Abstract

Background: The foundation of SPICES Model of teaching and learning is in its facilitation skills and resources which are vital to student learning. SPICES Model is a mode of teaching in the undergraduate medical curriculum at the Moi University College of Health Sciences.

Objectives: The objective of this study was to outline the challenges facing innovative teaching and learning method at the College of Health Sciences.

Methods: 274 students, 65 lecturers and 9 administrators were recruited into the study. Self-administered questionnaires with both qualitative and quantitative were used in data collection. Questionnaire utilized a five point Likert scale (1-Totally disagree, 2-Disagree, 3-Not Sure 4-Agree and 5-Totally Agree). Cronbach's alpha, median and inter-quartile range (IQR) was calculated in SPSS 22. P-value less than or equal to 0.05 was taken as statistically significant. Ethical approval was obtained from the Institutional Review and Ethics Committee (IREC) of Moi University and Moi Teaching and Referral Hospital.

Results: 58 (23%) of students said that the program is confusing; rarely do we know what is expected of us. Others, 72 (29%) said it demands a lot from the student; while 58 (23%) hold the view that this system gives excuse to the lazy lecturers to avoid going to class to teach in the name of the students doing self-directed learning. Sixty two students (25%) think that tutorials are overcrowded. Majority of the lecturers 40 (62 %) said that SPICES Model is not improving with a large number of them 26 (40 %) saying all members of staff should be re-trained on SPICES Model of teaching and learning in order to improve it, however some of them 5(8 %) wanted SPICES Model to be abolished. There was no statistical significance between the number of years the lecturers who have been teaching and whether SPICES Model was improving or not as the p-Value (0.138) this result was not statistically significant at $p < 0.05$.

Conclusions: The main challenges were the inadequate teaching and learning resources and training in SPICES Model of teaching and learning to both staff and students. There is overcrowding in all courses in the College, to mitigate on that, management should consider reducing intake until such a time that new facilities are in place.

Recommendations: The college should organize annual workshops; separately for both students and lecturers to refresh on SPICES Model of teaching and learning and this will increase acceptability of this program moreover there is need to increase teaching and learning resources; such as teaching space, laboratories and library; whiteboard, LCD projectors, computers, e-books and internet connectivity and reduce intake until such a time that new facilities are in place.

Key Words

SPICES Model; Lecturers; Challenges; Students

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Introduction

Innovative Teaching and Learning Method

Innovative teaching and learning method called SPICES Model; commonly referred to as problem-based is a program or series of events which the teacher implements to assist the student to remain focused on what that individual is doing. It stimulates the students' ability to engage in problem-solving activities that make a student an expert in

his/her area of concentration. This process makes a student an active learner and the teacher a facilitator (Zhu, Wang, Cai, & Engels, 2013).

Due to the shortfalls of lecture method in teaching and learning, constructivists searched for a solution to the existing problem (Cotič & Zuljan, 2009). Constructivists emphasized a collaborative approach whereby both the lecturer and the student will participate. Yew and Schmidt argue that the

constructivists were looking for approaches whose instruction method would emphasize collaborative and self-directed learning. They wanted an approach which is flexible to the teacher and the student (Yew & Schmidt, 2012).

They considered several approaches such as problem-based, student-centered, project-based and self-directed programs. In all these programs, the lecturer becomes a facilitator and the student is the tutor. They wanted programs which would make students work in groups using a designed problem that is tailor-made to meet their individual academic needs. This was meant to assist every student study at the level that meets students' ability (Groff & Mouza, 2008).

Innovative approach to learning was facilitated by the growth of technology in 19th century the introduction of instructional media in teaching facilitated various innovative opportunities (Hmelo-Silver & Barrows, 2006). To meet the needs of innovative teaching and learning method, majority of the institutions who adopted it opted for problem-based teaching and learning method. problem-based teaching and learning method became increasingly popular in educational institutions because of actively being able to engage students in constructing knowledge (Rezende-Filho, da Fonseca, Nunes-Souza, da Silva Guedes, & Rabelo, 2014).

Innovative method of teaching and learning adopted by medical colleges is the problem-based learning. Problem-based learning has been introduced to improve the quality of graduating health professionals. They argue that graduates taught using problem-based learning method are more competent and systematic compared to the ones trained using traditional lecture method.

Inception of Innovative Teaching and Learning Method

At the beginning of 19th century, medical students were attached to a qualified doctor to learn the practical skills after going through the theory in class but towards the end of the same century Hopkins Medical School made changes that brought in radical transformation in medical education and the practice of medicine by dividing the course to cover basic sciences and practical in the hospital wards. Medical schools used small classes to enable students to use innovative methods such as Problem-based learning.

When Americans were making changes in their training of doctors and medical education as a course, Britain was also reviewing the way of training doctors. They had realized that training of

doctors was not good enough in that it emphasized on factual recall at the expense of higher level of cognitive functions such as evaluation, synthesis and problem solving (Dennick & Exley, 1997).

Perspective of Moi University College of Health Sciences

In 1990, Moi University Faculty of Health Sciences, now the College of Health Sciences was started. In 1994, it became WHO Problem-Based Learning collaboration center (Kangethe, 1999).

This College had her first intake of medical students in 1990 (Daily Nation, February 8th, 1995) and adopted SPICES Model in its teaching and learning programs. This model use Problem- Based Learning (PBL) as a strategy for teaching and learning.

Currently the College of Health Sciences use innovative method to teach, with the acronym SPICES which has the following meaning:-

S = Student Centered Learning

P = Problem – Based Learning

I = Integrated Learning

C = Community Based Education and Service

E = Electives

S = Systematic

Student-centered

SPICES model makes a student the center of learning. The student is the one taking the initiative to learn. It makes the student be a self-directed and learner-centered. It also makes the student a task-based person with the student taking the lead; one owns the findings and retains them for long (Abraham & Azaje, 2013).

Problem-based

This method uses formulated problems as a stimulus for a teaching process; whereby students go through a tailored problem seeking for a solution. The solution students arrive at enables them internalize the process of solving problems the student will recall this knowledge content in future. Lecturers facilitate the student to do self-directed learning and the student expects the lecture to be a resourceful individual.

Integrated

All the courses start with the basic sciences then it moves to the clinical; are taught in interrelated or unifying disciplines. Students are taught in a way that each relates to the other. In this program, students are exposed to the whole aspect of medicine from the beginning to the end; and for a student to move to the next class, must pass the current course, because this course builds to the course.

Community-Based (oriented) Education Services

Students are taught community-based issues by allowing them to take time off from the college to stay in the community and participate in solving health-related problems. During COBES students are allowed to go and study medicine in the community using the community as a teaching laboratory; and that kindles the desire to go back to them after graduation to serve the community.

Elective

An elective is when a student is allowed to go and practice his/her health professionalism in another institution other than the one that has been teaching that individual. It can be an institution within or outside the country.

Systematic

The whole curriculum is taught systematically. Each unit leads to the other and students can understand the interrelationship of the course one course leads the student to the next one; able to allow the student to relate with what he/she had learned earlier. To reinforce systematic course presentation, no student is allowed to proceed to the next course before passing an earlier one.

Challenges in the Implemented SPICES model

Availing Funds to Run the Program

A major disadvantage of using SPICES Model is that it is costly in all aspects. To start with there is need for more lecturers to conduct tutorials and practical in laboratories. When one compares SPICES Model and lecture method, lecture method is the cheapest in that one lecturer can teach a large group of students. SPICES Model, requires small tutorial groups of 7-10 students in a group. In lecture method, one lecturer can teach a large group of about 200 students (Prince & Felder, 2006).

Human Resource

Human Resource comprises lecturers who teach, and support staff who ensure that students are facilitated in their studies. They include library, transport and all non-teaching staff who provide services to students.

Challenges Encountered by Students

Though SPICES Model is built on principles of adult learning, still there is a possibility that the experiences of students in a given class differ; others are slow learners while others are fast enough to understand the content. The slow learners then will take home very little content in a tutorial. Prior learning experiences at times do not prepare students well; yet SPICES Model is based on the foundation that all students have the same

experiences. This raises the need to induct both lecturers and students in SPICES Model of teaching and learning because some join the program without prior knowledge (Smith, Sheppard, Johnson, & Johnson, 2005).

The real problem comes in that prior learning experiences do not prepare students for SPICES Model. Students are moved from passive class work to hands on one without making adequate preparations in orientating them. Smith suggests that every institution should have strategies for overcoming student resistance to SPICES Model by training them to appreciate. Once they appreciate it, group dynamics takes over to stimulate the group into seeking solutions (Smith *et al.*, 2005).

At Moi University College of Health Sciences, first year students are taught how to use SPICES Model of teaching and learning. Newly appointed lecturers are invited to join first years when they are being instructed on the way to use this model.

Negative attitude held by both the students towards SPICES Model is a constraint in appreciating this program one's attitude affects the outcome of what that individual is working on. If a lecturer does not present SPICES Model positively to the students; then students develop negative attitude towards it (Kang'ethe, 2013).

The other challenge that might arise is that of learning to work in groups such as tutorial groups. All along students have been sighted in large groups, but now the said student is told to work in a group of between 7-10 students as this student will feel exposed because every individual in a small group has to be an active participant. Such students revert back to their comfort zone of desiring to be taught using lecture method (Sweller, 1988)

Challenges Encountered by Lecturers

Failure to train lecturers might make some lecturers to avoid participating in the program. This was encountered by a University in Uganda when they introduced COBES program, yet the institution had not trained lecturers to know what was expected of them in supervising students during COBES. Some of the lecturers decided to keep away from joining students during COBES.

Jinadu warns of the teaching institutions getting into a crisis of missing lecturers as time goes by; if training them is not continuous. This is caused by attrition and moving to better paying opportunities. Even where lecturers have not moved to other institution; death and retirements are unavoidable (Jinadu, Davies-Adetugbo, Ogunbodede, & Adetugbo, 1997).

Challenges Encountered by Administrators Serving Students

Lack of trained personnel affected several universities in West Africa. It made some administrators render services half-heartedly in that they did not understand the system. Others decided to be skeptical about the new SPICES model. When administrators start serving students half-heartedly or skeptically; it is a sign of failure on the entire program service providers who harbor suspicions in the program ends up causing friction in the system resulting into bringing it to a halt (ten Cate, Snell, & Carraccio, 2010).

Lack of Teaching Rooms

Corrigan opines that infrastructure put up for a particular number of students; soon government policy change and decide to increase the number of students to be admitted. An example is The Federal Democratic Republic of Ethiopia which faced a challenge of increased number of students to be admitted to join university, they exceeded available space. Veitia argues that increased intake beyond the available infrastructure in the third world reduces SPICES model of teaching and learning to mixed or even back to lecture method. This might remain as a setback in the third world for a number of years because government policies are not pegged on revenue.

Double intake exerts pressure to all available resources resulting in graduating low quality students. This leads to overcrowding in teaching rooms and a higher student ratio to the lecturers. Tutorial groups will be overcrowded too, hence complains by lecturers concerning overcrowding and excess workload.

Lack of Instructional Media Apparatus

Concerning instructional media, at times they are not enough to serve all the students. This results in overcrowding of students to one projector. Erickson urges that implementers should note that instructional media is based on the population of the students in that they are like text books (Ericsson, 2008).

Overcrowding is brought about by the lack of funds to buy more instructional media apparatus. Kei affirms this by arguing that the cost of buying instructional media is high, that they are very

expensive for institutions struggling to get funding (Kei, 2011). Due to scarcity of resources available lecturers are left to improvise the best way to teach without instructional media; resulting in reducing innovative teaching and learning method to a mixed one (Veitia, McCarty, Kelly, Szarek, & Harvey, 2001).

The few instructional media apparatus that are functional are faced with interruptions on electricity line, yet almost all instructional media apparatus use electricity all contractors contracted to install electricity to consider installing them with backups.

Lack of Vehicles to Transport Students and their Goods

Transportation of both students and their goods is faced with shortage of vehicles. Institutions whose programs include COBES face another challenge of funding it when University decides to take students for COBES, which is the time they faced quite a number of challenges such as funds to pay for their expenses, transport, housing, and supervision of students. At times, students have to walk long distances to do their assignments. Housing may not be to the students' standard some lack basic necessities, such as running water and electricity.

Results Students

When students were asked to name the weaknesses of SPICES Model; 58 (23%) of them said that the program is confusing; rarely do we know what is expected of us. Others, 72 (29%) said it demands a lot from the student; while 58 (23%) hold the view that this system gives excuse to the lazy lecturers to avoid going to class to teach in the name of the students doing self-directed learning. Sixty two students (25%) think that tutorials are overcrowded, as per table 1

Challenges of SPICES Model as viewed by Lecturers

Lecturers agree with students that this system creates room for some of them to absent themselves from going to class in the name of students doing self-directed learning 15 (30%). While 25 (38%) of them said that the program needed a lot of resources. Others, 20 (32%) said that the system lacked supervision as a result some lecturers failed to attend classes, as per table 2

Ser.	Responses	Percentage
	Students	
1	It is confusing rarely do we know what is expected from us	23%
2	Demands a lot from the student	29%
3	Creates excuse for lecturers absenteeism that students are doing SDL	23%
4	Overcrowded tutorial groups	25%

Table 1: Challenges of SPICES Model as viewed by students

	Responses	
	Lecturers	
1	Creates room for absenteeism among the lecturers	30%
2	Needs a lot of resources	38%
3	Needs a lot of supervision which is lacking	32%
4	As the College ages, which direction is the program taking?	
	More SPICES model	17%
	More lecture method	15%
	More mixed method	66%

Table 2: Challenges of SPICES Model as viewed by lecturers

Majority of the lecturers 40 (62 %) said that SPICES Model is not improving with a large number of them 26 (40 %) saying all members of staff should be re-trained on SPICES model of teaching and learning in order to improve it, however some of them 5(8 %) wanted SPICES Model to be abolished. There was no statistical significance between the number of years the lecturers has been teaching and whether SPICES Model was improving or not as the p-Value (0.138) this result was not statistically significant at $p < 0.05$.

Conclusions

The main challenges were the inadequate teaching and learning resources and training in SPICES Model of teaching and learning to both staff and students. There is overcrowding in all courses in the College, to mitigate on that, management should consider reducing intake until such a time that new facilities are in place.

Recommendations

Emanating from the findings of this study, it is recommended that the College management should:

1. Organize annual workshops; separately for both students and lecturers to refresh on SPICES Model of teaching and learning and this will increase acceptability of this program.
2. There is need to increase teaching and learning resources; such as teaching space, laboratories and library; whiteboard, LCD projectors, computers, e-books and internet connectivity and reduce intake until such a time that new facilities are in place.
3. Supervision of lecturers, students and administrators should be intensified by having monthly administrative meetings to receive progress reports on the challenges of teaching and learning and hence solutions would be agreed upon.

4. Further research on performance of the graduates in the job market should be done.
5. Lastly, further research be done on administrators' poor understanding of SPICES Model, whether it affects the services they offer to students.

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Successes and Limitations of Community-Based Education Service at Moi University School of Medicine, Eldoret, Kenya

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Abstract

Background: Community-based education has been introduced in many medical schools around the globe, but evaluation of instructional quality has remained a critical issue. Community-based education is an approach that aims to prepare students for future professional work at the community level. Instructional quality should be measured based on a program's outcomes. The purpose of this study was to evaluate the successes and limitation of COBES.

Methods: 274 students, 65 lecturers and 9 administrators were recruited into the study. Self-administered questionnaires with both qualitative and quantitative were used in data collection. Questionnaire utilized a five point Likert scale (1-Totally disagree, 2-Disagree, 3-Not Sure 4-Agree and 5-Totally Agree). Cronbach's alpha, median and inter-quartile range (IQR) was calculated in SPSS 22. P-value less than or equal to 0.05 was taken as statistically significant. Ethical approval was obtained from the Institutional Review and Ethics Committee (IREC) of Moi University and Moi Teaching and Referral Hospital.

Results: The response rate among students was 250 (91%), 65 (48%) among lecturers and 9 (100%) among administrators. 77% of students accepted that the college is short of vehicles for COBES. Majority of the students felt that COBES provides an opportunity to meet real life problems of the community and is challenged to provide solutions to the existing health problems. Participant 098 stated that "COBES Provides different approach to solving problems and alternative and realistic approach in seeking answers to actual health problems".

Conclusions: Community based education motivates students to practice community health care. In addition, their motivation is increased by the health education activity. Participating in this activity probably produces a positive effect and improves the instructional quality of the program based on its outcomes.

Policy Implications: Community based education during medical school has a positive effect on students. However, the adoption has been met with some concern, primarily because of the substantial manpower and means of transport. COBES becomes a major concern when there are limited resources available.

Key Words

Community-Based Education; COBES; Community Healthcare

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Background

Community-based education is effective in fostering health personnel who are responsive to community needs. Community-based education has been started in many medical schools around the globe as an innovative approach to medical education. Students are taught community-based issues by allowing them to take time off from the college to stay in the community and participate in solving health-related problems. During COBES students are allowed to go and study medicine in the community using the community as a teaching laboratory; and that kindles the desire to go back to them after graduation to serve the community as argued by (Bojuwoye, 2011). This is in line with

Kenyan government reason of starting Moi University aimed at graduating personnel who could work in rural areas. Taking students to the community makes them more likely to seek for meaning to the community's health problems and how to solve them. This method is more informative as opposed to lecture method which is theoretical. A student who has attended COBES is more informed about community's health problems as opined by Lonka (Lonka, 2013). This approach was introduced to enable students learn community's health problems as per community's perspective.

The strength of SPICES model; is that of taking

students through COBES program is a way of training health professionals in the community. This program helps students to relate hospital based diseases and the community the patient comes from. It is a way of training health professionals in a holistic approach in medical education (Baliddawa, Undated).

The importance of COBES is that it inculcates community medicine in the training of health professionals in a practical way, promotes preventive health and research as a way of finding solutions to community's health problems (ibid). Courses are taught in an integrated approach whereby subject matter interrelates and even students from all the four schools learn together. Though interrelated, all the teaching is systematic. Students participate in COBES by going to the community and staying there for a period of six weeks. They undertake electives by going to partner hospitals both within the country and foreign partnering Universities. One has to participate in a COBES program every academic year. Students study about community's health problems and seek to solve them.

The main objectives of COBES are to train health care professionals who are sensitive to the health needs of the community. This gives students an opportunity to learn health problems of the community, their nature and the magnitude of these problems; then seek to offer solutions to them. This is how the course is designed:-

1. During first year, students are introduced to community health, and what they will encounter when they go to the community. They are taught the basic principles of epidemiology, structure of health care delivery systems and the role of health care providers. This will help students identify problems when they go for COBES, refer them to the relevant health care provider.
2. In their second year, they do community diagnosis by going to the community for a period of six weeks; mainly to learn from the community. They get to know community's health problems; attempt to offer solutions assisted by their lecturers and officers in charge of the centers.
3. In the third year students prepare a COBES proposal to be researched in fourth year as COBES IV. In this research, they identify special features that affect health in urban communities. They facilitate community self-reliance by using research to look for sustainable solutions to community's health problems.

4. In fourth year, students conduct data collection, analyze, write and submit a report. This is aimed at using research as a tool in seeking solutions to community's health problems.
5. In fifth year, they go to County hospitals to learn Health Management; this enables them to learn various aspects of health services offered at the County hospitals. Students whose programs run for 4 years, COBES 4 and 5 are all undertaken in the fourth year of study.

The reason why students are exposed to research methods in first year; before going for COBES in second year is to equip them with the skills to seek for empirical solutions to community's health problems. In second year, they have the opportunity to identify the community's health problem, in third year one is expected to develop a proposal aimed at seeking solutions to the existing community's health problems. In fourth year, students do their research; and in COBES five, one can disseminate the findings, By use of research it helps students use evidence based solutions to community's health problems, and this is achieved by introducing students to community health problems in first year; in the second year they are introduced to community diagnosis. In third year students prepare research proposal of a health problem they can identify to be implemented in fourth year, as presented by Baliddawa (Undated: 2-3). At this time the student who is conducting research, has vast experience with community's health problems owing to COBES program.

In all these activities, students are given time to conduct self-directed learning which includes conducting research to find solutions to their identified problems as explained in the Moi University College of Health Sciences (2015:3).

That majority of the basic sciences courses which are taken by all Schools; students are taught at the same venue by the same lecturers. This approach makes the student relate each course to the other as argued by (Majumder, D'Souza, & Rahman, 2004). It means that when courses are integrated, students from the schools of Medicine, Public Health, Nursing and Dentistry can be taught together and that improves students' view about human health dimensions. But it is worth noting that it is only COBES and basic sciences courses which are taught together; because all health professional trainees spend much of their first and second years doing basic sciences. After basic sciences the only course that runs throughout their curricula in an integrated manner is COBES. That helps them relate their courses to actual practices in their field of study. As such, their teaching will be multi-professional and

multi-disciplinary. But where courses are interrelated; they are taught following each other starting with the one that has the basics of the other courses.

Mixing students from the four schools during COBES fosters team-work among themselves; and this helps them in getting to know that community health problems need a teamwork approach. That community's health problems are better solved using all dimensions of health professionals such as public health officers, nursing officers, dentists, medical practitioners, mental health specialists and physiotherapists.

Sending students to the community to stay within the community and learn the community's health problems is a combination of practical experience which a student encounters when serving a patient in the rural areas as opined by van den Wiel (van de Wiel, 1997). As such, the student gets relevant knowledge and aspires to research for a solution to the identified community's health problems.

It does not only expose the student, but it makes the trainees desire to be posted in the rural areas because they already have experienced community's needs (Friedman et al., 1990) opines that such graduates who had COBES in their curriculum do not resist being posted to rural areas, and this achieves one of the objectives of establishing Moi University to train personnel who can work in rural areas they cite Nigeria and Ethiopia as examples that have used that program and realized that their graduates are not opposed to taking up postings to rural centers.

Resources for COBES

Transport is a key factor in facilitating COBES success; and this is in line with WHO (2013:13) guidelines that institution using innovative teaching and learning must include COBES in their curriculum (WHO, 2013).

Universities in West Africa such as University of Ilorin, Obafemi Awolowo University and Ile-Ife Ogun University, all in Nigeria who included COBES in their curriculum faced a challenge of having to transport students to the community as opined by (Jinadu, Davies-Adetugbo, Ogunbodede, & Adetugbo, 1997). COBES is one of the ways students will come in contact with the actual health problems and needs of the community during their training. It should be seen as an integral part of problem-based method of teaching and learning; innovative learning especially problem-based learning must include COBES in her curriculum as opined by (Friedman et al., 1990).

It will be more difficult if the people in authority do not understand what COBES is all about. even if they try to find a way of transporting students to COBES centers they will be doing it half-heartedly (Kangethe, 1999).

Apart from the problem of getting vehicles to transport students to the community, Democratic Republic of Ethiopia was faced by poor road network in the rural areas. This demands that transport required ought to be one that can withstand impassable roads in the rural areas, which are encountered in almost all developing countries (Jinadu et al., 1997).

Results

The study established that teamwork among students in all the four Schools has been facilitated through electives and community-based education and service (COBES). Majority of the student participants said that COBES and electives had helped them to improve in their academic performance. They said that the COBES programs had enhanced their performance because students were integrated from four schools enabling them to learn from one another. When medical students put their expertise together, they are able to tackle difficult health problems from all dimensions as observed by both Bojuwoye and van den Wiel (Bojuwoye, 2011; van de Wiel, 1997).

The other benefit of electives and COBES is that they provide an opportunity for medical students to encounter real health problems of the community. During COBES and electives; students were challenged to provide solutions to existing community's health problems. This provided an alternative, practical and realistic approach to learning and problem-solving as supported by (van de Wiel, 1997).

Students identified COBES and field trips as the most ineffective programs due to lack of sufficient vehicles. This particular problem has also been registered in reports by Chang (Chang et al., 2011). To alleviate this problem, more vehicles need to be procured for COBES and field trips. The University administrators and lecturers must see COBES as part of the curriculum that requires full support like others courses in the curriculum. However, if programs such as COBES and field trips are seen as extra-curricular activities, procurement of the needed vehicles will not be given the priority it deserves. This view has been shared by Kang'ethe (1998:31), Kiguli-Malwadde et al (2006:10), Jinadu et al (1997:20) and the Federal Democratic Republic of Ethiopia (2015:4).

Conclusions

Community based education motivates students to practice community health care. In addition, their motivation is increased by the health education activity. Participating in this activity probably produces a positive effect and improves the instructional quality of the program based on its outcomes. Institutions of higher learning need to invest more in COBES and not look at it as an extra curricular activity.

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Constructing the Human Face: Learning Anatomy Through Sculpture

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Abstract

A good appreciation of complex facial anatomy is critical for head and neck surgeons. Facial anatomy and its subtle nuances is not taught adequately at a junior surgical level and comprises a small niche in the Membership of the Royal College of Surgeons (MRCS) examinations. Learning facial anatomy through sculpture is a novel way for trainees to fully appreciate not only the anatomy, but also the subtleties and variations of the ageing patient. In this article, the author describes his experience of a 5 day course teaching facial anatomy through sculpture.

Key Words

Education; Sculpture; Face, Anatomy

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The meticulous retrieval of evidence at the scene, the interview of suspects, the officers' best objectivity when analysing such a violation of nature. But most importantly, the crux of the investigative process is identification of the victim. And that's the trouble in a small proportion of murders where the body may not be identifiable, with only the skull to lend clues to the victim's identity.

And that's how it starts, "with just a skull", tells Richard Neave (a retired forensic artist and anatomist). During the five-day course, Richard and a faculty of expert consultant surgeons take a group of 8 trainees through reconstruction from a bare skull, to a complete bust of a live model. The course is run annually in Birmingham and is convened by senior plastic surgeon Francis Peart. It is designed to teach participants the anatomical approach to reconstruction. This involves building layer upon layer over the skull- from accurate muscular attachments, glands and arteries, to discrete fat pads of the face and finally the skin.

Richard starts by explaining the context and importance of skills we are about to learn, choosing an exemplar from his past. He describes in detail how the reconstruction of a skull led to the identification of a young murdered woman in the 1980's. We start from a bare skull with the eyes, observing the bony prominences and foramina that compose the orbit after an informative lecture from an expert oculoplastic surgeon (Fay Mellington). As

a surgeon in training, I spent the lion's share of my learning using the powerful tool of observation- a tool that can go only so far in augmenting and consolidating new knowledge. Such is the power of this course: having learned the anatomy of the orbit, we start by sculpting the delicacy of the tarsal plate and canthal ligaments, out of wax, with careful reverence of their insertions.

At this stage, the sculptures look nothing more than skulls with strangely expressive eyes, disturbingly staring just behind you into the distance. Later in the day we move to the nose, observing and sculpting the shape from wax formed by numerous complex discrete cartilages. Some moments can be frustrating as you realise that your keen sense of observation may not have been as accurate as you'd first envisaged. Missing a detail leads to your nose looking strangely odd. Fortunately, Richard is quickly at hand to correct your mistake and explain the subtlety in the anatomy before we move on to sculpting the many muscles of the face (including the longest named levator labii superioris alaeque nasi muscle).

Sculpting is not the only interest of this course. For each discrete area of the face, sessions are interspersed with seminars and tutorials from experts. This year, Demetrius Evriviades (a military head and neck surgeon), gave an outstanding lecture on the application of anatomy when reconstructing severe facial injury from the Afghanistan and Iraq

wars. An autologous ear reconstruction surgeon from Hull (Cher Bing Chuo) gave her practical experience when sculpting the key cartilaginous components for a new ear from a harvested rib graft. Interestingly, Francis Peart also gave his excellent guidance on the anatomical variations of the face when aging, and the rationale for surgical intervention for improved cosmesis.

Participants on the course were from all grades and backgrounds, from University students to junior registrars and senior consultants. Not everyone was new to sculpting, with the opportunity to learn from those who had sculpted regularly. For all participants, the course provided the opportunity to kindle the love of human anatomy form through wax sculpture in an environment away from the pressures of clinical practice- a luxury which I certainly very much appreciated. By the end of the course everyone had a great sense of achievement on completion of their sculpture. Each person had

created a unique model, with the individual style and freedom to display key parts of anatomy important or new to them (Figure 1 and 2).

I would whole heartedly recommend this course to anyone interested in surgery or anatomy. Or simply those who are interested in the artistry of how the face is affected by deeper structures. Indeed, one participant was a student artist who used the anatomy learned to create more realistic characters in the film industry.

I think as a plastic surgery trainee, it is imperative to not only appreciate the anatomy but also the beauty and form of the face. The cost of the 5 day course a not unreasonable £600 for trainees and includes artistic material and gourmet hot lunches by the hotel. The course is endorsed by the Royal College of Surgeons of Edinburgh and attracts 29.5 CPD points (www.buildingthebody.co.uk).

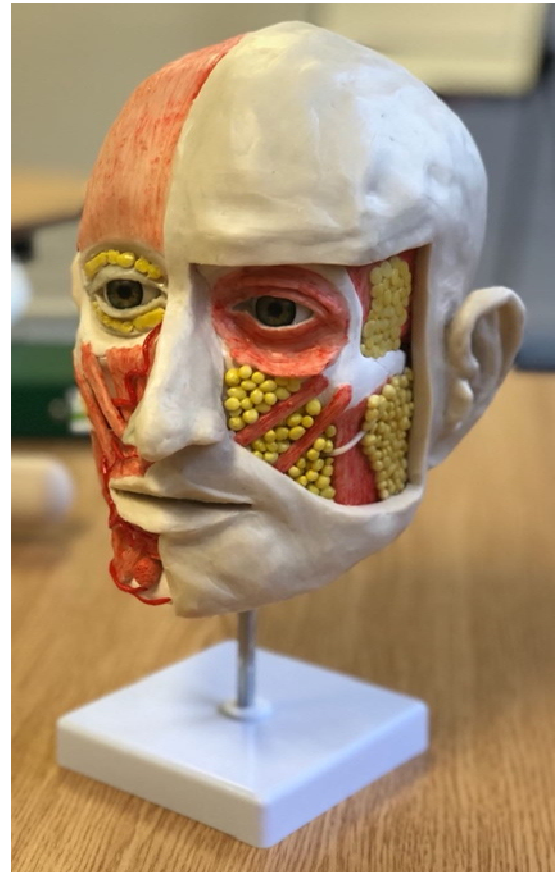
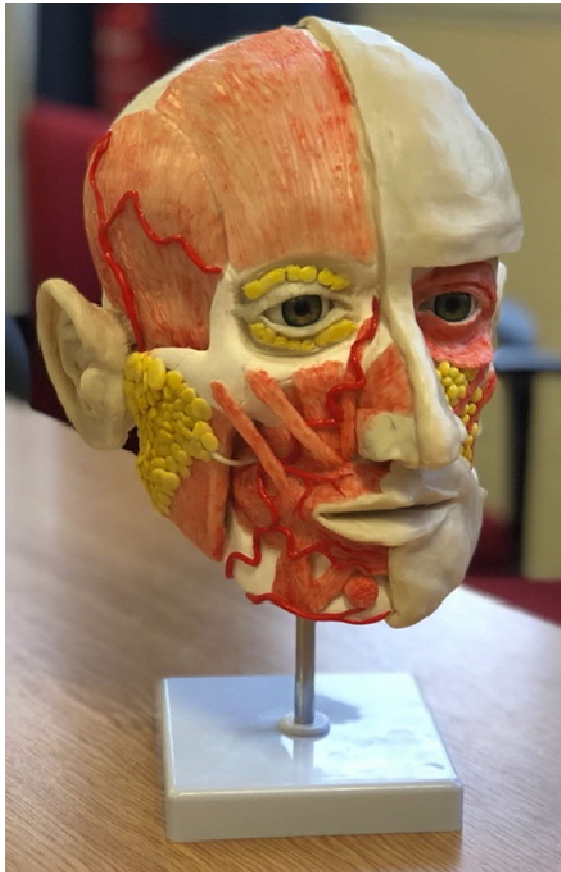


Figure 1 and 2: My completed sculpture

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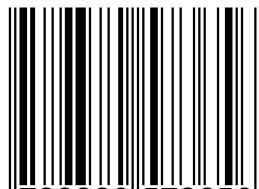


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