WJMER

World Journal of Medical Education and Research

An Official Publication of the Education and Research Division of Doctors Academy

DOCTORS ACADEMY

BETTER EDUCATION. BETTER HEALTH.

ISSN 2052-1715

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.

Volume 21, Issue 1, 2019, World Journal of Medical Education and Research (WJMER). An Official Publication of the Education and Research Division of Doctors Academy Group of Educational Establishments.

Electronic version published at	:	Doctors Academy UK, 189 Whitchurch Road, Cardiff, CF14 3JR, South Glamorgan, United Kingdom
Print version printed and published at	:	Abbey Bookbinding and Print Co., Unit 3, Gabalfa Workshops, Clos Menter, Cardiff CF14 3AY
ISBN	:	*978-93-80573-69-4.*
Designing and Setting	:	Doctors Academy, DA House, Judges Paradise, Kaimanam, Trivandrum, 695018, Kerala, India
Cover page design and graphics	:	Sreekanth S.S
Type Setting	:	Lakshmi Sreekanth
Contact	:	wjmer@doctorsacademy.org.uk

WELCOME

It is our great pleasure to bring you the twenty-first edition of the World Journal of Medical Education and Research (WJMER). This edition assembles a variety of intellectually-stimulating articles in an attempt to offer the reader an insight into the innovative research that is being conducted throughout the world.

The opening article by Morris et al. assesses the impact of focused small-group teaching on undergraduate medical students through an annual ENT OSCE course based on the ENT UK curriculum. The authors conclude that such small-group teaching sessions are effective in helping students to improve their knowledge and confidence in ENT.

The following article by Allhelo considers the awareness and use of evidence-based medicine (EBM) resources among physicians in Jordan, illustrating how the employment of such resources may benefit healthcare. Allhelo identifies the most common EBM resources and maintains that there is a good awareness of EBM among Jordanian physicians, which subsequently benefits healthcare.

In the third article, Tomkins and Gilbert explore the impact of coaching on individuals who have failed two or more of the same postgraduate examination. They found that referrals for coaching improved concentration, enhanced examination and revision techniques, and built confidence in the exam. However, the authors highlight that the distance to coaching sessions remains a barrier to the service that needs to be overcome. Nyarko et al. examine the role of research in the Basic Medical Education (BME) of undergraduate medical students in Sub-Saharan Africa (SSA). The authors discuss how BME in SSA largely focuses on basic medical sciences and clinical training rather than the development of research competencies. They contend that developing research competencies is beneficial to solving contemporary challenges in SSA communities and that this can be attained by enforcing a multidisciplinary approach via a reform of the BME to become more research-oriented.

In the penultimate article, Wani et al. discuss Internet/digital usage amongst medical college students of King Khalid University, Saudi Arabia. Their findings suggest a worrying trend regarding the time spent by students on the internet, evidence of dependence in a subset of students, and potentially-associated health issues such as sleep disturbance, anxiety, dry eye, headaches, and visual disturbance.

In the final article, Chege considers the challenges experienced in Sub-Saharan Africa (SSA) regarding recruitment and retention of doctors in rural and remote areas. The article also explores how community-based medical education (CBME) may influence the choice of rural practice in Kenyan-trained doctors. Chege concludes that CBME plays a positive role in the choice of rural practice, with exposure to rural Kenya in early life, during training, and in early career posting also proving important.

We sincerely hope that you find each article in this edition informative, interesting, and enjoyable to read.

Ms Karen Au-Yeung
Editor

Ms Rebecca Williams
Associate Editor

Professor Stuart Enoch
Editor-in-Chief

Table of Contents

World Journal of Medical Education and Research:
An Official Publication of the Education and Research Division of Doctors Academy

Focused Small-Group Teaching in ENT: 3 Years' Experience in 159 Medical Students

Morris S*, Ross T**, Roderick M***, Yang D****

Institution
**Morriston Hospital, Heol Maes Eglwys, Morriston, Cwmrhydyceirw, Swansea SA6 6NL, United Kingdom*
***Imperial College Healthcare NHS Trust, The Bays, S Wharf Rd, Paddington, London W2 1NY, United Kingdom*
****North Bristol NHS Trust, Southmead Rd, Bristol BS10 5NB, United Kingdom*
*****North Midlands University Hospital, Newcastle Rd, Stoke-on-Trent ST4 6QG, United Kingdom*

WJMER, Vol 21: Issue 1, 2019

Abstract

Objectives: To assess the impact of small-group teaching on undergraduates and to quantify the benefit from a focused teaching course. This was delivered through a student-led ENT society course based on the ENT UK curriculum.
Design: An annual ENT OSCE course ran annually between 2015-2017. Students were given a pre- and post-course questionnaire at each course in order to determine student knowledge and confidence in managing ENT conditions.
Setting: The annual course ran in the institution's medical school teaching rooms.
Participants: Attendees included 159 undergraduate students from the same institution, all of whom were in the final or penultimate year of medical school.
Results: Of the 159 attendees, 82% felt that the current delivery of ENT in undergraduate curricula was inadequate. Comparing the pre-course and post-course questionnaires, all participants reported improved confidence in knowledge in all teaching domains: epistaxis, hearing loss, otoscopy, vertigo, and sore throat.
Conclusions: This study is consistent with the current literature by highlighting the dissatisfaction amongst medical students with the representation of ENT in undergraduate curricula. Results show the effectiveness of small-group teaching sessions in helping students improve their ENT knowledge and confidence.

Key Words

Education; Otolaryngology; Curriculum; Students; Peer Group

Corresponding Author:
Mr Simon Morris; E-mail: s.morris@doctors.org.uk

Introduction

ENT conditions form a large proportion of both GP and emergency presentation.[1-4] Despite this, the current literature suggests that as a specialty, ENT is under-represented in undergraduate curricula.[5] Recent surveys of medical students and junior doctors found that a large proportion did not feel confident in managing basic ENT conditions.[6-9] This is particularly concerning given that the majority of ENT emergency clinics around the UK are led by the most junior members of the team: foundation doctors who may be in their first or second year out of medical school.[10]

A systematic review looking at whether current undergraduate programmes adequately prepare medical students for managing ENT conditions identified a need for development in the current curriculum, but also noted that more primary research regarding ENT curricula is required.[5]

ENT UK have recently developed an undergraduate curriculum for ENT, however this curriculum can only be recommended and not imposed on UK medical schools.[11]

In 2015, ENT-SOC (Ear, Nose and Throat Society) was founded by students at a UK medical school. This student-led organisation delivers additional ENT teaching to medical students to supplement the compulsory ENT training in the undergraduate curriculum. The teaching is delivered in liaison with both the medical school's mandatory curriculum and the curriculum suggestions published by ENT UK.

With consideration to the current curriculum gaps demonstrated in the literature, and the consequent limited exposure medical students have to ENT, the authors designed an Objective Structured Clinical Examination (OSCE) revision course at the institution. This initiative was led not only to prepare students for their university examinations but with a view to further expose them to common

ENT presentations, hence improving their confidence prior to their imminent encounter with these during clinical practice.

This study aimed to assess the current quality of ENT teaching at the medical school and quantify the benefit from this additional focused ENT course.

Materials and Methods

Ethical Considerations

Ethical Approval was not considered necessary for this study. Participants were informed that completion of the questionnaires consented to the use of their anonymised data.

Participants and Data Sources

The annual ENT OSCE course ran in May of 2015, 2016 and 2017.

The course was advertised to all fourth (penultimate) and fifth (final) year medical students at the institution via the medical school bulletin. Places were provided to allow maximal attendance within the constraints of providing a small-group teaching setting.

Tutors were selected from a cohort of local junior ENT trainees who had an interest in medical education. Sessions were delivered utilising practical elements and case-based discussions. Taught material was chosen based on the medical school's ENT learning objectives in conjunction with the ENT UK curriculum recommendations; this was to ensure that the course covered the necessary topics likely to be examined in compulsory examinations. Course participants rotated around different clinical stations focused on an individual topic, similar to the format seen in OSCEs. Five areas of basic ENT were covered each year:

- Epistaxis
- Hearing loss
- Otoscopy
- Vertigo
- Acute sore throat

A questionnaire was created for participants to answer pre- and post-course. Questions assessed the students' confidence in the taught topics (above) using a Likert scale graded from 0 (no confidence) to 10 (total confidence). The questionnaire also collected data on students' opinions of the current provision of ENT teaching at the university and the value of future, additional ENT teaching sessions.

Data were entered anonymously to Microsoft Excel (Redmond, WA), which was used to analyse data and create figures. Changes in the mean Likert scale score between the pre-course and post-course questionnaires is indicated as + (improvement) or – (regression).

Results and Analysis

One hundred and fifty-nine (n=159) students attended the OSCE revision course over the 3-year period. In 2016, there were 46 participants, in 2017, 72 participants and 2018, there were 41 participants. All completed the pre-course and post-course questionnaires (100%).

All students were in their fourth or fifth year of a five-year MBChB course at the same medical school which teaches ENT in the fourth year of the course. All students in attendance had completed their ENT attachments at the time of the annual course date in May. On average, each student received 5.7 days of ENT during the 5-year MBChB course (range 0-14 days). Of the students in attendance, 81.90% felt that the amount of mandatory ENT exposure they received was inadequate, 11.10% felt that it was adequate, and 1.38% felt that it was excessive.

Comparing the pre-course and post-course questionnaires, all participants reported improved confidence in knowledge in all teaching domains. **Figure 1** shows the overall compiled data across the 3 years with pre- and post-course confidence mean scores and standard deviation.

At baseline, participants felt that they were most confident in performing otoscopy (mean score 6.04, standard deviation (SD) 1.55) and least confident in managing vertigo (5.11, SD 1.50). Post-course, participants were most confident in managing epistaxis (8.38, SD 1.02). The areas with the greatest improvement in confidence were: hearing loss (+2.52), epistaxis (+2.36), and vertigo (+2.22). **Figure 2** shows the data split by year. In 2016, confidence in managing epistaxis improved from 5.9 to 8.3, hearing loss 5.4 to 7.7, otoscopy 5.6 to 7.6, vertigo 5.3 to 7.4, and acute sore throat 5.1 to 7.2. In 2017, confidence in managing epistaxis improved from 6.4 to 8.5, hearing loss 5.5 to 8.5, otoscopy 6.3 to 8.2, vertigo 5.4 to 7.5, and acute sore throat 5.8 to 7.4.

In 2018, confidence in managing epistaxis improved from 5.7 to 8.4, hearing loss 4.9 to 7.2, otoscopy 6.1 to 7.9, vertigo 4.7 to 7.1, and acute sore throat 5.3 to 7.4.

All participants felt more confident that they had enough knowledge to begin work as a foundation doctor in ENT (mean score improvement 4.66 to 7.09).

Discussion

This study is consistent with the current literature by highlighting the dissatisfaction amongst medical

students with the representation of ENT in undergraduate curricula.[5] However, the authors proposed to ameliorate this problem through the introduction of small-group teaching sessions with a peer-assisted learning facilitator.

The importance of thorough undergraduate ENT training for all doctors cannot be understated. As only a small number of doctors have post-graduate rotations in otolaryngology, knowledge of the specialty for most doctors is gained primarily from their undergraduate experience. Despite this, the average length of time spent in ENT at an undergraduate level is 1.5 weeks, with some medical schools not offering any formal attachment whatsoever.[12] This was reflected in our study where the average ENT attachment lasted 5 days.

Compared to other specialties, UK medical students feel significantly less confident in clinical competencies in ENT (including history taking, examination and management) compared to other specialties such as cardiology.[5,6] This low confidence is also seen at a postgraduate level, with junior doctors often needing further training to successfully manage ENT emergencies in the emergency department.[13]

It is apparent in the literature that the underrepresentation of ENT in medical schools is not a problem confined to the UK. Indeed, a recent US study highlighted the need for increased exposure to the specialty at an undergraduate level and proposed the introduction of a universal otolaryngology medical student curriculum.[14]

The current study cohort reflected this, with over 80% of students feeling that current delivery was inadequate. In addition, pre-course data suggested that all students had poor confidence in their ability to manage basic ENT emergencies and presentations.

The question still remains about the best way to improve ENT undergraduate teaching and which topics should be prioritised. A recent Delphi survey of the current ENT undergraduate curriculum found that the highest scoring areas were history taking and examination, red flag symptoms, common ENT conditions including otitis externa, rhinosinusitis, pharyngeal infection, and airway compromise.[15] Our study addressed the majority of these topics with an added focus on emergencies, recording improvements in all areas: particularly in confidence managing epistaxis and hearing loss.

Although a relatively novel teaching method, the benefit of small-group teaching with a peer-assisted facilitator in the delivery of anatomy to undergraduate medical students has already been demonstrated.[16] In addition, the utilisation of peer-assisted learning, a concept where learning is supported by a peer who has themselves only recently mastered a knowledge set, has been shown to be beneficial to students' learning experiences.[17] This contributes to a more 'collaborative approach' whilst adding benefit for student and teacher alike.

The authors believe that this teaching method could be extended to the delivery of the ENT undergraduate curriculum, particularly because students at this institution do not receive any formal ENT teaching during their curriculum via a standardised approach. ENT is taught during the clinical attachment and thus students may not have received any formal ENT training if they have not engaged with clinical attachment.

Strengths and Limitations

This is the first study known to the authors to look at the value of providing near-peer facilitated small-group teaching to teach medical students ENT. The authors have run the course for three consecutive years to improve the reliability of their results.

These sessions were non-compulsory and thus there may be an element of volunteer bias in the results. This issue could be addressed in the future by making ENT small-group teaching a compulsory part of the medical school curriculum. This could also be combined with the introduction of summative assessments during students' ENT rotation, which has previously been shown to have significantly helped students' learning.[18] Furthermore, as the results of this study come from a single institution, similar studies into ENT small-group teaching would be required at other institutions to further validate these findings.

The authors have demonstrated a valuable improvement in students' confidence in their knowledge, however, a formative post-course assessment would judge this objectively. Further study is required to assess retention.

Conclusion

Our study has shown the effectiveness of small-group teaching sessions in helping students to improve their ENT knowledge and confidence. Given the increased pressure on medical schools and the vast curriculum they have to cover, the authors believe the introduction of these sessions provides a useful and efficient way to deliver ENT teaching to medical students, helping them to

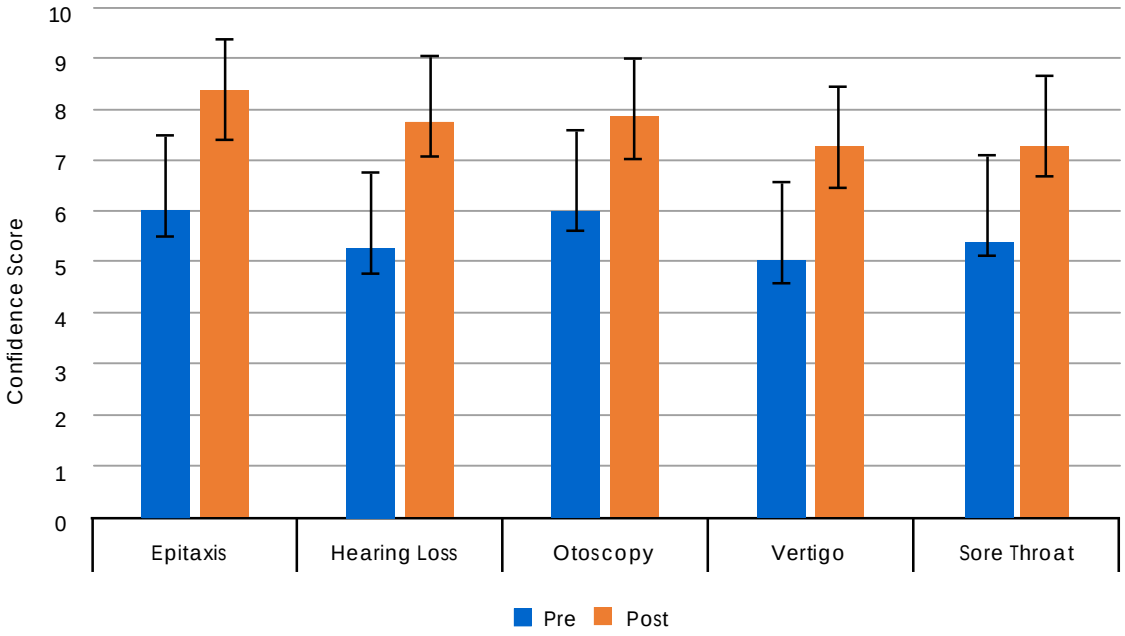

Figure 1: Overall combined pre- and post-course confidence over 3 years in each topic (2016-2018)

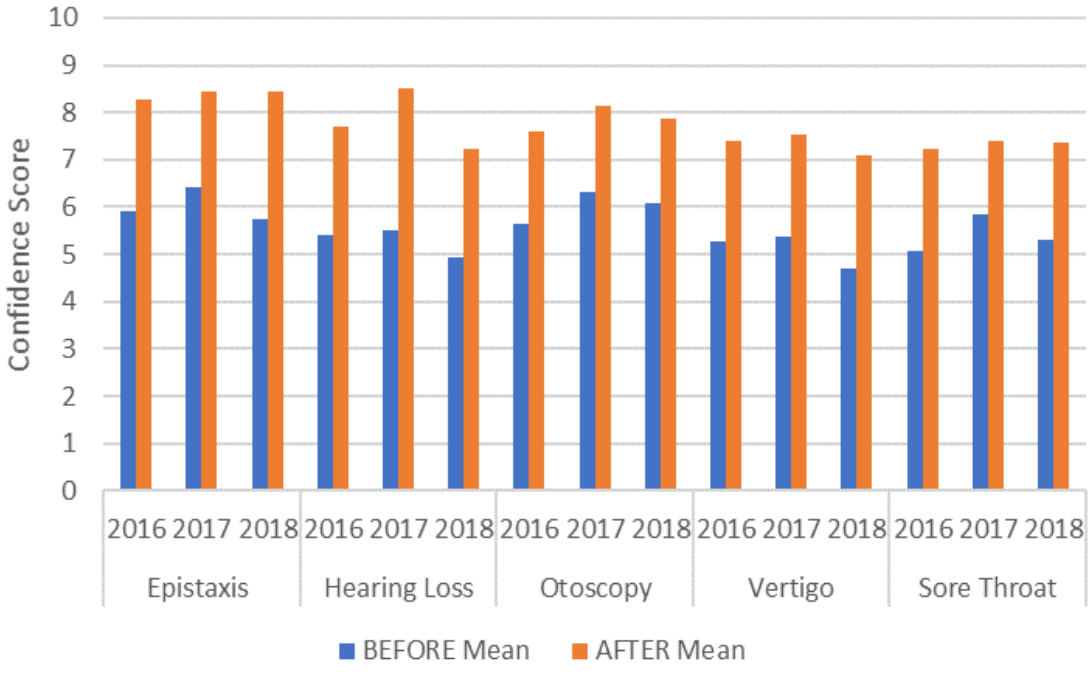

Figure 2: Pre- and post-course confidence split by year and taught topic (2016, 2017, 2018)

References

1. Powell S. So you want to be an ENT surgeon. BMJ 2007;334(7605):205-207
2. Griffiths E. Incidence of ENT problems in general practice. J R Soc Med 1979;72(10):740-2
3. Morris PD, Pracy R. Training for ENT problems in general practice. Practitioner 1983;227 (1380):995-9
4. Donnelly MJ, Quraishi MS, McShane DP. ENT and general practice: a study of paediatric ENT problems seen in general practice and recommendations for general practitioner training in ENT in Ireland. Ir J Med Sci 1995;164 (3):209-11
5. Ferguson GR, Bacila IA, Swamy M. Does current provision of undergraduate education prepare UK medical students in ENT? A systematic literature review. BMJ Open 2016;6(4)
6. Powell J, Cooles FA, Carrie S, Paleri V. Is undergraduate medical education working for ENT surgery? A survey of UK medical school graduates. The J Laryngol Otol 2011;125(9):896-905
7. Chawdhary G, Ho EC, Minhas SS. Undergraduate ENT education: what students want. Clin Otolaryngol 2009;34(6):584-5
8. Clamp PJ, Gunasekaran S, Pothier DD, Saunders MW. ENT in general practice: training, experience and referral rates. The J Laryngol Otol 2007;121(6):580-3
9. Sharma A, Machen K, Clarke B, Howard D. Is undergraduate otorhinolaryngology teaching relevant to junior doctors working in accident and emergency departments? The J Laryngol Otol 2006;120(11):949-51
10. Swords C, Leach L, Kasbekar A, *et al* A multifaceted approach to improving the quality of ENT Emergency Clinic referrals. BMJ Open Quality 2017;6:u206639.w6166
11. Lloyd S. ENTUK Undergraduate Curriculum. 2014. Version 1. http://sfo.entuk.org/services/undergraduate-curriculum [Accessed 19/03/2019]
12. Mace AD, Narula AA. Survey of current undergraduate otolaryngology training in the United Kingdom. The J Laryngol Otol 2004;118 (3):217-20
13. Whitcroft KL, Moss B, McRae A. ENT and airways in the emergency department: national survey of junior doctors' knowledge and skills. The J Laryngol Otol 2016;130(2):183-9
14. Ishman SL, Stewart CM, Senser E, Stewart RW, Stanley J, Stierer KD, *et al*. Qualitative synthesis and systematic review of otolaryngology in undergraduate medical education. Laryngoscope 2015;125(12):2695-708
15. Lloyd S, Tan ZE, Taube MA, Doshi J. Development of an ENT undergraduate curriculum using a Delphi survey. Clin Otolaryngol 2014;39(5):281-8
16. Morris S, Osborne MS, Bowyer D. Head and Neck Anatomy: Effect of Focussed Near-Peer Teaching on Anatomical Confidence in Undergraduate Medical Students. Journal of surgical education. 2018;75(6): 1486-1490
17. Fulford L, Gunn V, Davies G, Evans C, Raza T, Vassallo M. Near peer integrated teaching for final year medical students. Perspect Med Educ 2016; 5(2): 129–132.
18. Woods R, Subramaniam T, Patterson A, Hennessy M, Timon C. Validation and evaluation of new assessments for the otolaryngology undergraduate medical clerkship. The J Laryngol Otol 2015;129(12):1228-33

World Journal of Medical Education and Research:
An Official Publication of the Education and Research Division of Doctors Academy

Evidence-Based Medicine
DAUIN 20190157

Awareness and the Use of Evidence-Based Medicine Resources Among Physicians

Alhelo A

Institution
Ministry of Health, Pr. Hamzah St., Amman, Jordan

WJMER, Vol 21: Issue 1, 2019

Abstract

Aims: To evaluate awareness and the use of evidence-based medicine resources among physicians in Jordan.
Methods: A cross-sectional study of the internet was performed among 517 responsive doctors from a total of 717 doctors; a total of 72.1% response rate. Doctors from all specialties were contacted via a Facebook group called "Doctors Café in Jordan". A questionnaire was given to each individual to measure their awareness and use of evidence-based databases.
Results: Of the 517 physicians who participated, 377 stated that they were using evidenced-based resources frequently, 91 were using resources but not frequently, and 49 were not using evidence-based resources. The resource that was most frequently used by the physicians was PubMed, followed by other resources such as UpToDate, National Guideline Clearinghouse, Medscape, BMJ Best Practice, e-Books, and other online journals for published papers. The physicians were surprisingly unfamiliar with the Cochrane Library.
Conclusions: There is a good awareness of EBM amongst physicians in Jordan, which subsequently benefits healthcare.

Key Words

Evidence-Based Medicine; EBM Resources; Physicians

Corresponding Author:
Mr Amjad Alhelo; E-mail: amjadrrrr@hotmail.com

Introduction

Evidence-based medicine (EBM) can be defined as the use of evidence from well-established research to enhance proper decision-making by medical care practitioners. Avicenna, a famous ancient physician who was also known as Ibn Sina, was one of the first physicians to conduct clinical and basic research, which has since provided the basis for EBM in medical history[1]. The proper use of EBM in medical practice involves turning a medical problem into a question, then searching for an answer to that question within the available resources. This evidence-based answer should then be critically appraised before being used to solve the medical problem in clinical practice[2].

With the emergence of new research that could dramatically affect guidelines and hence the decision -making process, the use of EBM is critical to worldwide healthcare improvement. All physicians and clinical practitioners should, therefore, be able to identify the best clinically-applicable and valid research evidence. They should also be able to translate such information into clinical practice wherever applicable. Unfortunately, this goal is far from reachable at this current time[3].

Evidence can be divided into two types: primary and secondary. Secondary evidence is most common amongst physicians and clinical practitioners due to their busy lifestyles. Secondary evidence, such as systematic reviews, allow the reader to reach several pieces of literature containing primary evidence that have undergone critical appraisal by clinical experts at once[4]. The Cochrane Library produces such systematic reviews with the highest level of evidence[5].

The following are some of the most important evidence-based resources mentioned in the questionnaire:

- **UpToDate**: A trusted system that provides evidence-based online clinical data to many physicians around the world[6]. Clinical data is reviewed by authorised personnel who summarise the conclusions into recommendations that can be easily applied to clinical practice.
- **MD Consult:** A resource for full-text medical journal articles and thousands of patient's handouts and drug-related information.

- **PubMed/MEDLINE**: A database of abstracts for millions of medical research articles as well as links to full article resources.
- **BMJ Best Practice**: A very quick and reliable resource for point-of-care delivered information. It combines the latest guidelines and evidence with opinions from experts regarding all aspects of health from diagnosis-reaching treatment to prognosis.
- **Other Known EBM Resources**: BMJ Case Report, Medscape Reference, ACP Journal Club, National Guideline Clearinghouse, DynaMed, Database of Abstracts of Reviews of Effect (DARE).

Jordan, or the Kingdom of Jordan to be more specific, is an Arab country, with a population of at least 10 million citizens located in western Asia[7]. For every 10,000 citizens in Jordan, there are 28.6 physicians and 17.8 pharmacists according to the latest statistics done by the Private Hospitals Association in Jordan[8].

Methodology

A direct message was sent on Facebook to 717 Jordanian doctors from different specialties who were randomly chosen as a sample from Doctors Café Facebook group. The group contained more than 5000 health care workers. Only 517 doctors responded to the message and agreed to participate in the survey. Two online questionnaires were sent to the participants to complete, one of which regarded general information about participants' characteristics, as shown in **Table 1** and **Table 2**. Data from all filled questionnaires were collected, revised, and analysed manually. The study started in January 2018 and ended in August 2019.

Table 1: Questionnaire for awareness about EBM

1. Are you using EBM resources?	YES	NO	
2. How frequently are you using EBM resources?	DAILY	2-3 TIMES WEEKLY	LESS OFTEN
3. Which of these EBM resources are you using?			
a. UpToDate			
b. MD Consult			
c. Cochrane Library			
d. PubMed/MEDLINE			
e. BMJ Best Practice			
f. Medscape Reference			
g. Annals of Internal Medicine: ACP Journal Club			
h. Database of Abstracts of Reviews of Effect (DARE)			
i. National Guideline Clearinghouse			
j. DynaMed			
k. Scopus			
l. OvidSP			
m. CINHAL Plus with Full Text			
n. J-Gate Plus			
o. Online journals of various publishers (Elsevier Science, Lippincott, Wiley-Blackwell, Springer Link, Informa Healthcare, Karger, Thieme, BMJ, Oxford University Press, Sage, Nature, etc.)			
p. e-Books of various publishers (Elsevier Science, Lippincott, etc.)			

Table 2: Respondent physicians' characteristics

Sex	Male	
	Female	
Age Group	<30	
	30-39	
	40-49	
	50-59	
	>60	
Education Degree	Bachelor's Degree (General Physician)	
	Master's Degree	
	Doctorate	
Average No. of Daily Visiting Patients	<20	
	20-39	
	40-59	
	60-79	
	>80	

Results

The results of the questionnaire revealed that 90.5% of physicians in the tested sample used evidence-based resources. It was found that online evidence-based resources were more popular among physicians. Although most physicians were familiar with EBM, most of them didn't use it daily. Of the study group, 197 physicians (42%) used it between two and three days a week, while 182 others used it daily (39%). The other 89 (19%) participant doctors used it less often. There were no big differences identified between the evidence-based resources used. The most popular among them were PubMed, which was used by 16% of participants. Other popular resources included UpToDate and the National Guideline Clearinghouse, both of which were used by 52 (11.1%) participants.

Table 3: Respondent physicians' characteristics

1. Are you using EBM resources?	YES	NO	
	468 (90.5%)	49 (9.5%)	
2. How frequently are you using EBM resources?	DAILY	2-3 TIMES WEEKLY	LESS OFTEN
	182 (39%)	197 (42%)	89 (19%)
3. Which of these EBM resources are you using?			
a. UpToDate			52 (11.1%)
b. MD Consult			12 (2.6%)
c. Cochrane Library			17 (3.6%)
d. PubMed/MEDLINE			75 (16%)
e. BMJ Best Practice			46 (9.8%)
f. Medscape Reference			40 (8.5%)
g. Annals of Internal Medicine: ACP Journal Club			27 (5.8%)
h. Database of Abstracts of Reviews of Effect (DARE)			3 (0.6%)
i. National Guideline Clearinghouse			52 (11.1%)
j. DynaMed			32 (6.8%)
k. Scopus			5 (1.1%)
l. OvidSP			3 (0.6%)
m. CINHAL Plus with Full Text			10 (2.1%)
n. J-Gate Plus			1 (0.2%)
o. Online journals of various publishers (Elsevier Science, Lippincott, Wiley-Blackwell, Springer Link, Informa Healthcare, Karger, Thieme, BMJ, Oxford University Press, Sage, Nature, etc.)			43 (9.2%)
p. e-Books of various publishers (Elsevier Science, Lippincott, etc.)			50 (10.7%)

A greater proportion of participants were male physicians (76%) than female physicians (24%). Most of the participants were aged between 30 and 49, with 42% of the participants aged between 30-39, and 32% aged between 40 and 49. The remaining participants were scattered between younger (<30) and older (>50) age groups. Only 59 of the participants were general physicians; the remaining were specialised physicians. Of the total participants, 55.3% held master's degrees while 33.3% held a doctorate. The most common number of daily patient visitors among the participating physicians was between 40 and 60 patients.

Table 4: Respondent physicians' characteristics

Sex	Male	395 (76%)
	Female	122 (24%)
Age Group	<30	45 (8.7%)
	30-39	217 (42%)
	40-49	165 (31.9%)
	50-59	76 (14.7%)
	>60	14 (2.7%)
Education Degree	Bachelor Degree (General Physician)	59 (11.4%)
	Master's Degree	286 (55.3%)
	Doctorate	172 (33.3%)
Average No. of Daily Visiting Patients	<20	47 (9.1%)
	20-40	120 (23.2%)
	40-60	254 (49.1%)
	60-80	31 (6%)
	>80	65 (12.6%)

Conclusion

The participating group of physicians was a good sample that represented most Jordanian physicians. The awareness of EBM resources among Jordanian physicians was very acceptable, with a percentage exceeding 90% in the study sample. Such awareness has helped to improve physician knowledge, which in turn has had a positive impact on their decision-making, subsequently improving healthcare in Jordan. It was found that Jordanian physicians were more familiar with online EBM resources; this may be due to a lack of time as a result of seeing an average of 50 patients per day. The most popular EBM resources among physicians in Jordan included PubMed, UpToDate, and the National Guidelines Clearinghouse.

References

1. Barter DC, Daly WJ (May 2000). "Clinical pharmacology in the Middle Ages: principles that presage the 21st century". Clin. Pharmacol. Ther. 67 (5): 447–50 See p. 449. doi:10.1067/mcp.2000.106465. PMID 10824622
2. Tanjong-Ghogomu E, Tugwell P, Welch V. Evidence-based medicine and the Cochrane Collaboration. Bull NYU Hosp Jt Dis. 2009;67:198-205. Medline:19583554
3. Haynes RB. What kind of evidence is it that Evidence-Based Medicine advocates want health care providers and consumers to pay attention to? BMC Health Serv Res. 2002; 2:3. Medline:11882257 doi:10.1186/1472-6963-2-3
4. Geyman JP, Wolf FM. Evidence-based medicine. In: Norris TE, editor. Informatics in primary care. New York (NY): Springer Verlag; 2002. p. 71-88. 5
5. Borlawsky T, Friedman C, Lussier YA. Generating executable knowledge for evidence-based medicine using natural language and semantic processing. AMIA Annu Symp Proc. 2006;56-60.
6. Physicians at Grupo Hospitalar Conceição Trust UpToDate for Evidence-Based Answers at the Point of Care. Retrieved from: www.wolterskluwerhealth.com. Accessed on 2 September 2019.
7. Ghazal, Mohammad (22 January 2016). "Population stands at around 9.5 million, including 2.9 million guests". The Jordan Times. Retrieved 12 June 2018.
8. Jordan beats US in number of doctors per citizen retrieved from: https://en.royanews.tv/news/12653/Jordan-beats-US-in-number-of-doctors-per-citizen. Accessed 4 September 2019.

Medical Education
DAUIN 20190158

World Journal of Medical Education and Research:
An Official Publication of the Education and Research Division of Doctors Academy

Remediation Through Coaching for Repeated Examination Failure: Trainees' Perspectives

Tomkins A*, Gilbert J**

Institution
**Pennine Acute Hospitals NHS Trust, The Royal Oldham Hospital, Rochdale Rd, Oldham OL1 2JH, United Kingdom*
Health Education England, 3 Piccadilly, Manchester M1 3BN, United Kingdom

***Worklife Balance Company, Preston, United Kingdom*

WJMER, Vol 21: Issue 1, 2019

Abstract
Successful attainment of postgraduate medical examinations is a prerequisite for career progression across medical specialties. Failure to successfully pass examinations can have detrimental impacts upon training pathways. Regionally in North West England, individuals who have failed two or more of the same postgraduate examination are offered referral for coaching sessions to provide individualised support and maximise potential for success. To evaluate medical trainees' perceptions of the coaching value, formative research via an online survey was distributed to all coached trainees in 2018. The survey was developed and piloted, then distributed to participants following completion of the coaching programme. Free text and Likert rating scale responses were recorded. Thematic analysis was conducted using the Framework Method.
Of 37 trainees undergoing coaching, 26 completed the questionnaire (a response rate of 70%). The main themes that arose from the data were: improved concentration, enhanced examination and revision technique, and confidence in the examination.
Coaching appears to enhance confidence and examination technique, through the therapeutic coaching relationship and multimodal preparation technique, thus supporting the continued provision of this service. Results will be of interest to those involved in the provision of remedial support for postgraduate trainees.

Key Words
Remediation; Examination; Coaching; Postgraduate; Training Difficulties

Corresponding Author:
Dr Andrew Tomkins; E-mail: andrewtomkins@nhs.net

Introduction

Remediation of trainees who are struggling to attain high stakes examination is of crucial importance both for the trainees' progression and for quality assurance of the healthcare workforce.[1] Despite attempts to standardise the process, postgraduate remediation remains challenging, with a more individualised approach often required due to the presence of multiple contributory factors leading to examination failure.[2] Postgraduate examination failure may negatively impact trainees' morale and ability in continuing with their chosen training pathway.[3] Increasingly, educational training and governing bodies are releasing recommendations regarding the imposition of an upper limit in the number of attempts per postgraduate examination, thus highlighting the essential need to ensure struggling trainees are adequately prepared for subsequent re-takes to progress in their career pathways.[4] Coaching is slowly gaining interest in the medical education setting, particularly for skills-based training.[5] Whether coaching in the remediation setting is perceived to be beneficial or viable is yet to be reported. Regionally, since 2016, Health Education England (working across the North West), the leadership organisation for education, training and workforce development in England, have provided support for struggling trainees via an automatic referral process for examination coaching, following two or more unsuccessful attempts at the same postgraduate examination. The aim of this formative study was to explore participants' perceptions of the value of the examination coaching programme in helping them to prepare for subsequent examination sittings in order for the service to be further tailored to the needs of the trainee and enhance understanding of coaching in the remedial setting.

Materials and Methods

The existing coaching programme involves between one and five sessions with a coach who utilises a standardised, multi-methods approach. Each session lasts between 1.5 and 3 hours. Sessions place emphasis on building rapport leading to an effective working alliance, with the trainee taking responsibility for both the formulation and implementation of study strategies. Coaching

incorporates the following strategies: assessing time availability with the trainee, creating a study plan, creation of notes (flashcards and audio-notes), utilisation of mnemonics and ambient learning, and mock questions. Additionally, audio-visual techniques are used for mock-assessment and review of performance, which involves video recording of participants and playback with feedback. The trainee is facilitated to create a 'study unit', which can be replicated for individual preparation.

As part of the evaluation process, a survey was distributed to all trainees who underwent examination coaching through this service in 2018 (**Appendix 1**). This was emailed to trainees on completion of the coaching, with results anonymised and sent to the primary researcher. The survey used both free text and Likert rating-scale based questions with the hope of the creation of rich data. Responses were clustered into common themes using the Framework Method, which was selected due to its systematic yet flexible approach.[6] Due to the sensitive nature of the topic, limited demographic details were collected in the questionnaire and an assurance of confidentiality was provided, with all potentially identifiable data being suitably anonymised. Informed consent for publication was obtained.

Results

Of the 37 trainees that underwent examination coaching in 2018, 26 participants completed the evaluation form (a response rate of 70%). Participants were from a range of Anaesthetic (42%), Surgical (27%), Medical (19%), and Radiology (12%) training backgrounds. The number of sessions ranged from one to five (median three). Fifteen participants were preparing for a written examination, eight for an oral examination, and three for both a written and oral examination.

The most commonly reported previous preparatory strategies were formal regional and national revision courses (18 participants). When asked how this examination coaching differed from previous preparation, the most frequently reported theme was that of enhanced revision technique, with participants referencing the multimodal approach to revision of benefit, and an improvement of recall in the examination in **Table 1.** Individualised support provision and the therapeutic relationship which developed with the coach was pivotal, particularly in allowing an open forum to express anxieties surrounding the examination process.

Using a Likert rating scale, participants rated the value placed on examination coaching with responses including 'extremely valuable' (42%), 'very valuable' (50%) and 'valuable' (8%). Ninety-six percent stated they would be prepared to undertake further coaching in the future if required, with one participant stating that they 'weren't sure' if they would. Respondents were asked the outcome of the examination their coaching was preparing them for, with an overall pass rate of 74%. Suggestions to improve the service included referral for coaching at an earlier stage, increased dedicated time to audio-visual recording and subsequent feedback, and making the coaching location more accessible for trainees.

Table 1: Reported remedial coaching experiences and perceived benefits

Theme (and Subthemes)	Example Participant Responses
Improved Concentration: • **Enhanced Recall** • **Enhanced Focus**	*'Improved ability to memorise large quantities of clinically irrelevant facts for the exam.'* (two participants) *'The sessions gave me more focus.'* (three participants)
Improved Technique: • **Exam Technique** • **Revision Technique**	*'Concentrated more on the non-knowledge-based side of the exam like presentation style'* (two participants) *'Multimodal revision – making notes, recording a spoken summary of notes, and then listening back to the summary.'* (twelve participants)
Therapeutic Benefits of Coaching	*'Made me feel comfortable, helped me overcome my fears.'* (four participants)
Improved Confidence	*'Instilled some self-belief that had become severely lacking due to repeated failures at examination.'* (three participants)

Discussion

Our findings suggest trainees with repeated examination failures place value on the provision of a structured approach towards exam preparation and the individualised support afforded from a coaching programme. Despite these, a paucity of published literature into coaching in remediation exists, with much of the research relating to medical education based in the setting of surgical skills acquisition, resilience development and non-technical skills such as team working (Lovell, 2018)[5]. Our findings are believed to be the first report of adopting coaching in the remediation process. Aspects relating to improved examination outcomes and the most effective remediation provision are considered in the coaching process.

The creation of a working alliance between coach and student has been identified as the pivotal factor in successful outcomes, which resonates with our findings[7]. The coaching provided adopts a multi-methods approach, which also compliments existing findings that medical learners are most likely to identify as multimodal learners, incorporating a combination of visual, auditory, reading, and kinaesthetic learning styles created through audio-visual techniques[8].

Existing research supports a more individualised approach in the remediation process[9]. However, to what extent the role of the individualised support versus the taught revision methods plays needs further exploration. Kotter and Niebuhr (2016)[10] studied undergraduate students, identifying that resource-orientated coaching may be an effective means of reducing stress in medical examinations. These findings suggest that coaching may enhance examination performance via negating the negative impacts stress and anxiety may play in the process. This is further supported by Powell (2004), who identified that individualised behavioural modification significantly improved examination outcomes in medical students with 'debilitating' examination anxiety[11]. A more in-depth exploration through individual interviews or focus groups may provide further clarification of the interplay of these factors.

The participant population of the study was small, thus limiting the transferability of findings to other settings. Despite a high survey response rate (70%), it is possible that the perspectives of those who did not find the coaching useful are lost if they opted not to complete the survey. The nature of the individualised coaching programme meant difficulty in participants providing anonymised feedback, however, the questionnaire did not request identifiable information and was analysed by the primary researcher who was not involved in the provision of coaching. Regarding examination outcome, it is possible that trainees were utilising other revision strategies simultaneously during their coaching as well as personal, social, or environmental factors playing a role in examination outcomes. A review of examination outcomes in trainees declining coaching may provide 'control' results and provide further information regarding ongoing funding of the coaching service.

Despite being piloted on medical trainees, the questionnaire was not validated, meaning further research would be necessary to support or dispute the findings. Due to potential concerns regarding the sustained benefits of short-term remediation, a more longitudinal follow-up may provide valuable insight as to the sustained impact coaching has on the trainee, for example, in subsequent examinations[12]. We plan to enhance the programme by adopting trainee improvement suggestions, such as increased allocated time to audio-visual work during the coaching session. Due to the formative nature of this exploration, we are currently considering the feasibility of implementing coaching provision remotely via videotelephony to maximise resources, as the distance to coaching sessions appeared to be the major barrier in those having accessed the service in 2018.

Conclusion

To our knowledge, this is the first published evaluation of the examination coaching programme for postgraduate examination preparation in the remedial setting. Our findings suggest that trainees with multiple postgraduate examination failures find benefit in the provision of examination coaching and the structure and the multi-methods approach it adopts. Results provide useful insights for those involved in the medical remediation process and support further exploration of the coaching in other settings, such as in undergraduate medical training and multi-professional curriculums.

References

1. Kalet, A., Chou, C.L., Ellaway, R.H. (2017). To fail is human: remediating remediation in medical education. Perspect Med Educ, 6: 418-424.
2. National Clinical Assessment Service. (2009). Handling concerns about a practitioners' behaviour and conduct: An NCAS good practice guide. NHS.
3. Harry, V., Bethelmy, A. (2007). Failing Postgraduate Exams. BMJ careers. http://careers.bmj.com/careers/advice/view-article.html?id=2699 Accessed 22nd March 2018.
4. General Medical Council. (2012). Postgraduate Standards and Guidance. National Professional

Examinations, 2012. https://www.gmc-uk.org/education/postgraduate/9813.asp Accessed 4th April 2018.
5. Lovell, B. (2018). What do we know about coaching in medical education? A literature review. Med Educ, 52 (4):376-390.
6. Gale, N.K., Heath, G., Cameron, E., Rashid, S., Redwood, S. (2013). Using the framework method for the analysis of qualitative data in multi-disciplinary health research. BMC Med Res Methodo, 12: 117.
7. Baron, L., Morin, L. (2009). The coach-client relationship in executive coaching: A field study Hum Res Dev Q, 20: 85-106.
8. Khanal, L., Shah, S., Koirala, S. (2014). Exploration of preferred learning styles in medical education using VARK modal. Russ Open Med J, 3 (3): 0305.
9. Klamen, D.L., Reed, G.W. (2011). The Efficacy of a Targeted Remediation Process for Students Who Fail Standardized Patient Examinations. Teach Learn Med, 23 (1): 3-11.
10. Kötter, T., Niebuhr, F. (2016). Resource-oriented coaching for reduction of examination -related stress in medical students: an exploratory randomized controlled trial. Adv Med Educ Pract, 7: 497—504.
11. Powell, D.H. (2004). Behavioral treatment of debilitating test anxiety among medical students. J Clin Psychol, 60(8):853-65.
12. Pell, G., Fuller, R., Matthew, M., Roberts, T. (2012). Is short term remediation after OSCE failure sustained? A retrospective analysis of the longitudinal attainment of underperforming students in OSCE assessments. Med Teach, 34:146–150.

Appendix 1: Survey Template

Exam Coaching Study Survey

1. Please confirm your specialty:

2. Please indicate examination outcome. Pass Fail

3. Was this a written/oral/OSCE-style exam? Written Oral OSCE

4. How many coaching sessions did you have? 1 2 3 4 5

5. What previous courses/preparation techniques had you tried for this exam?

6. In what ways did the exam coaching sessions differ from previously attempted techniques?

7. On the scale below, please indicate how valuable you think the exam preparation coaching was:

Not valuable	Somewhat valuable	Valuable	Very valuable	Extremely valuable
1	2	3	4	5

8. Which aspects of the coaching did you find most beneficial in preparing for your exam(s)?

9. Would you be prepared to undertake further coaching if facing similar challenges in the future?

Yes No

10. Which aspects of the coaching (if any) could be improved?

11. Would you recommend this coaching service to a colleague?

Yes No

If not, why not?

12. We would welcome any additional comments not covered in the above questions.

Medical Education
DAUIN 20190159

World Journal of Medical Education and Research:
An Official Publication of the Education and Research Division of Doctors Academy

Developing Research Competencies of Undergraduate Medical Students in Sub-Saharan Africa

Nyarko OO, Ansong D, Osei-Akoto A, Konadu SO, Opoku G

Institution
Komfo Anokye Teaching Hospital, Okomfo Anokye Rd, Kumasi, Ghana

WJMER, Vol 21: Issue 1, 2019

Abstract
There is a global demand for physicians; this demand is even higher in Sub-Saharan Africa (SSA) where individuals suffer significantly more from the global burden of disease but have a significantly higher healthcare workforce shortage. Since the introduction of the traditional medical education curricula by Abraham Flexner over 100 years ago, there have been major pedagogical changes globally with respect to Basic Medical Education (BME). Over the last few decades, medical education in SSA has undergone changes, however, there has been little innovation with respect to the field of research and capacity building. Medical education in SSA has largely focused on the basic medical sciences and clinical training with minimal attention being paid to developing research competencies amongst students. In developing research competencies of medical students, a multidisciplinary approach is needed. We recommend a reform of the entire BME curricula to make it more research oriented or alternatively, a reform of the research component of the curricula.

Key Words
Undergraduate Medical Education; Medical Research; Medical Curriculum; Medical Career; Sub-Saharan Africa

Corresponding Author:
Dr Obed Ofori Nyarko; E-mail: obednyarko360@gmail.com

Introduction

There is a global demand for physicians; this demand is even higher in Sub-Saharan Africa (SSA), where individuals suffer significantly more from the global burden of disease but have a significantly higher healthcare workforce shortage[1]. Many countries in SSA are catching up with the rest of the world when it comes to reducing the deficits in the healthcare workforce by investing in medical education[2]. Such deficits in the healthcare workforce serve as a major hurdle to achieving the Sustainable Development Goal Three (SDG 3) and ultimately improving healthcare in SSA. Over the last few decades, medical education in SSA has undergone many changes[3], however, there have been few innovations in medical education, especially in the field of research and capacity building. Scientific authors from SSA are also under-represented in the global publication of medical and scientific literature; this serves as a significant barrier to solving medical problems indigenous to SSA[4].

In SSA, medical education has largely focused on basic medical sciences and clinical training, with minimal attention being paid towards developing research competencies amongst students. In a significant number of medical schools in SSA, doctors are trained with limited knowledge and hands-on skills to conduct research and sparingly use research findings for evidence-based practice[5]. The curricula of many medical schools in SSA have elements of research methodologies but a limited scope of practical research training. This is grossly inadequate for the training of medical doctors with developing careers in medical research and the development of capable scientific minds to read and appreciate medical literature.

Since the introduction of the traditional medical education curricula by Abraham Flexner over 100 years ago[6], there have been major pedagogical changes globally concerning Basic Medical Education (BME)[7]. SSA has, however, struggled to keep pace with the rest of the world. This has led to significant deficiencies in medical research and the use of advanced technologies[5].

Literature on the Importance of Incorporating Research into Medical Education

A competency/outcome-based medical education (CBME)-informed curricula reform is the current recommendation of choice in redefining medical education, and it is practiced in many advanced countries[8]. The World Federation for Medical

Education stipulates clearly in its standards the need for medical research in the basic medical education curriculum[9]. The focus of health care and medical education has transitioned from individual to community-based with the aid of appropriate technology and research[8].

The Japanese incorporated research into their undergraduate curriculum as early as 1960, and as of 2014, 86% of the students had a research-oriented curriculum[10]. In the United Kingdom (UK), a survey done before and after a compulsory critical enquiry in 2nd year in Queens' University revealed a significant increase in students who expressed interest in pursuing a career in research[11].

In Germany, it is a requirement for students to complete a dissertation in order to attain the academic title of doctor. A study was conducted involving 437 5th-year students in a German university. Those who completed their research expressed a better appreciation for research methodology and had a better hold on the analysis of literature[12].

Another study, completed in five medical schools in the United Kingdom analysing 905 projects, revealed that only 13% of the projects were achieving a holistic approach to research methods[13]. Even though the majority of students are motivated to pursue research, students generally have a narrow definition of what research entails, according to research conducted amongst 317 undergraduate medical students in an Irish University[14].

Many medical schools are making an effort to incorporate research methodology into their curricula. However, a lot of finetuning is still required to achieve the optimum results of producing research-oriented graduates.

The Current Situation in SSA and Its Deficiencies

The medical school curriculum in SSA is designed to emphasise on community-oriented medical practice in most cases. Many medical schools still use the curricula of their colonial masters[15] and are hence out of touch with the current realities and challenges of the African health care system. In order to review and reform the curricula of medical schools to meet the current needs of the society, various stakeholders need to be consulted.

Issues ranging from admission criteria to teaching models need to be addressed as a matter of urgency. The traditional medical curricula in most schools have stood the test of time and emphasise the strong bedrock of basic medical sciences without much emphasis on medical research. Despite strong theoretical knowledge, there are arguably some deficiencies in knowledge integration and application. There have been calls to develop a competency-based curriculum that will involve producing medical graduates with sound knowledge in research best suited for the 21st-century generation[4]. A survey of sub-Saharan medical schools revealed that medical schools reported inadequacies in skills, research laboratories and research funding even though a majority of schools required students to engage in research activities before they can graduate[16].

There is currently a scarcity of research support, and the impact of research for faculty development has been largely ignored in the training of medical doctors[16].

Recommendations

As the twenty-first century unfolds, medical school curricula should undergo regular reviews to reflect the changing health needs of our contemporary society[4]. Regular reviews of curricula for training medical doctors are recommended every five years, according to Olopade and others[4]. We recommend a curricular reform of the entire BME curricula to make it more research-oriented. Alternatively, a reform of the research component of the curricula that follows a clear vision and mission could be implemented and evaluated after careful planning and monitoring.

When developing research competencies in medical students, the importance of incorporating research training very early into medical education cannot be overstated. Students should be given training in medical research and fieldwork from the first year of schooling. Teachers should primarily be research scientists to make it easier to link concepts to clinical medicine[7]. Students need rudimentary skills in research methodology that will enable them to read, understand, and appreciate medical literature.

Students should also be introduced to the various medical and educational technologies and software that aid in questionnaire development, data collection, analysis of data, interpretation of data, referencing and citations, and plagiarism checks. This will improve their research competencies if introduced at the beginning of their medical education.

There is a need to set up medical education research centres that can support medical education research. These departments will be responsible for teaching and promoting research in medicine and the use of medical technologies in research

education. They will expose students to competent scientific journals and provide seminars and conferences on how to publish and write peer-reviewed papers. Through this avenue, students will be taken through the processes needed to produce high-quality scientific papers for publication in competent journals.

We also recommend the setting up of research departments in the various medical schools with special emphasis on the training of research-oriented medical professionals.

Conclusion

To produce medical practitioners best suited to solving the contemporary challenges of the African community, attention needs to be paid to motivate, train, and equip medical students to explore the field of medical research.

References

1. Richard M Scheffler , Jenny X Liu , Yohannes Kinfu MRDP. WHO | Forecasting the global shortage of physicians: an economic- and needs-based approach. WHO. 2011;
2. Kiguli-Malwadde E, Talib ZM, Wohltjen H, Connors SC, Gandari J, Banda SS, et al. Medical education departments: a study of four medical schools in Sub-Saharan Africa. BMC Med Educ [Internet]. 2015 Dec 1 [cited 2019 Apr 19];15 (1):109. Available from: http://bmcmededuc.biomedcentral.com/articles/10.1186/s12909-015-0398-y
3. Greysen SR, Dovlo D, Olapade-Olaopa EO, Jacobs M, Sewankambo N, Mullan F. Medical education in sub-Saharan Africa: a literature review. Med Educ [Internet]. 2011 Oct [cited 2019 Feb 25];45(10):973–86. Available from: http://www.ncbi.nlm.nih.gov/pubmed/21916938
4. Olopade FE, Adaramoye OA, Raji Y, Fasola AO, Olapade-Olaopa EO. Developing a competency -based medical education curriculum for the core basic medical sciences in an African Medical School. Adv Med Educ Pract [Internet]. 2016 [cited 2019 Feb 25];7:389–98. Available from: http://www.ncbi.nlm.nih.gov/pubmed/27486351
5. Chen C, Buch E, Wassermann T, Frehywot S, Mullan F, Omaswa F, et al. A survey of Sub-Saharan African medical schools. Hum Resour Health [Internet]. 2012 Feb 24 [cited 2019 Apr 19];10:4. Available from: http://www.ncbi.nlm.nih.gov/pubmed/22364206
6. Quintero GA. Medical education and the healthcare system - why does the curriculum need to be reformed? BMC Med [Internet]. 2014 Dec 12 [cited 2019 Jul 10];12(1):213. Available from: http://bmcmedicine.biomedcentral.com/articles/10.1186/s12916-014-0213-3
7. Norman G. Medical education: past, present and future. Perspect Med Educ [Internet]. 2012 Mar [cited 2019 Apr 19];1(1):6–14. Available from: http://www.ncbi.nlm.nih.gov/pubmed/23316454
8. Reis S. Curriculum reform: Why? What? How? and how will we know it works? Isr J Health Policy Res [Internet]. 2018 [cited 2019 Jul 10];7 (1):30. Available from: http://www.ncbi.nlm.nih.gov/pubmed/29880061
9. BASIC MEDICAL EDUCATION WFME GLOBAL STANDARDS FOR QUALITY IMPROVEMENT Explanatory note to guide the use of the Standards. 2015.
10. Rintaro Imafuku, Takuya Saiki YS. Developing Undergraduate Research in Japanese Medical Education.: Discovery Service for Ghana. 2016.
11. Houlden RL, Raja JB, Collier CP, Clark AF, Waugh JM. Medical students' perceptions of an undergraduate research elective. Med Teach. 2004 Nov;26(7):659–61.
12. Kuhnigk O, Böthern AM, Reimer J, Schäfer I, Biegler A, Jueptner M, et al. Benefits and pitfalls of scientific research during undergraduate medical education. GMS Z Med Ausbild. 2010;27(5):Doc72.
13. Murdoch-Eaton D, Drewery S, Elton S, Emmerson C, Marshall M, Smith JA, et al. What Do Medical Students Understand By Research And Research Skills? Identifying Research Opportunities Within Undergraduate Projects. Med Teach. 2010 Jan;32(3):e152–60.
14. Burgoyne LN, O'Flynn S, Boylan GB. Undergraduate medical research: the student perspective. Med Educ Online. 2010 Jan;15 (1):5212.
15. Gukas ID. Global paradigm shift in medical education: issues of concern for Africa. Med Teach [Internet]. 2007 Jan 3 [cited 2019 Feb 25];29(9–10):887–92. Available from: http://www.ncbi.nlm.nih.gov/pubmed/18158659
16. Mullan F, Frehywot S, Omaswa F, Buch E, Chen C, Greysen SR, et al. Medical schools in sub-Saharan Africa. Lancet [Internet]. 2011 Mar 26 [cited 2019 Feb 25];377(9771):1113–21. Available from: http://www.ncbi.nlm.nih.gov/pubmed/21074256

World Journal of Medical Education and Research:
An Official Publication of the Education and Research Division of Doctors Academy

Medical Education
DAUIN 20190160

Internet/Digital Use Among Medical College Students of King Khalid University, Saudi Arabia

Wani MM*, Abbag LF**, Alkhttabi NF**, Assiri AA**, Bhat Z*

Institution
**Medway Maritime Hospital, Windmill Rd, Gillingham, Kent ME7 5NY, United Kingdom*

***King Khalid University, Guraiger, Abha 62529, Saudi Arabia*

WJMER, Vol 21: Issue 1, 2019

Abstract

Objective: Modern-day lifestyles have a heavy dependence on various digital technologies for information, inter-personal relationships, entertainment, and even economic transactions. The number of hours being spent by individuals has been increasing day by day. Due to the addictive nature of the problem, the terms Internet Addiction and Digital Addiction Disorder have been coined. With the aim to analyse epidemiological aspects of Internet/digital usage amongst medical students studying at King Khalid University, Abha, Saudi Arabia, we conducted this study.

Patients and Methods: In this prospective study, 153 subjects responded to an online questionnaire sent through WhatsApp. The majority of respondents were female medical students, followed by dental students.

Results: The results of the study found that about 21.57% of students were using the Internet for more than 10 hours out of 24 daily. The most commonly used application on their mobiles was WhatsApp (94.12%). A further 42.48% of students suffered from sleep disturbance, while 44.4% thought that digital devices were very important to their lives.

Conclusion: The study revealed a very serious trend regarding the time spent by students on the internet and the associated adverse health issues. There was evidence of dependence noted in a subset of students. It was concluded that awareness is a key factor as internet usage is personal and has an impact on both individuals and society as a whole.

Key Words
Internet, Addiction, Digital Devices

Corresponding Author:
Dr Mudassir M Wani; E-mail: mudassir.wani@nhs.net

Introduction

The Internet has brought about a revolution in the present-day digital world. The Internet is reaching an incredible speed and, at the same time, more of the world's population is gaining access to it. With the simultaneous expansion in innovations like smartphones, laptops, and iPods, the lives of present -day human beings have been affected in all spheres. This combination has changed the technical ways and approaches to education, business, and economics and has gone beyond to non-technical communities, social networking, and collaborative services. In the form of Facebook, Twitter, Linked-In, YouTube, and Wikis, the Internet has enabled people to communicate and share interests in many more ways. But how much internet is acceptable in terms of time, type, and content is quite variable. With people spending lot of time on the internet, terms like "Internet addiction" came up in research papers. Griffiths[1] was the first person who considered internet addiction to be a kind of technological addiction (such as computer addiction). He considered it as one in a subset of behavioral addiction (such as compulsive gambling).

With this background, we focused on the use of the internet among students of a Saudi university. We aimed to look at the time, type, content, health issues and other related aspects among the students in relation to internet usage. Although there have been many studies around the globe, we are the first group carrying out this study in Saudi Arabia. This study focused on students in the medical and allied colleges of King Khalid University.

Table 1: Distribution of the studied group regarding age

A S.N					
B Working Place/Studying Place	Asser Central Hospital 1		KKU, College of Medicine 2		
	KKU, College of Dentistry 3		KKU, College of Dentistry 4		
	KKU, College of Nursing 5		KKU, College of Dentistry 6		
	Others…….. 7				
C Sex	Male 1		Female 2		
D Social Status	Married 1		Single 2		
E Age Group	15-25 1	26-35 2	36-45 3	46-55 4	56-65 5
F Number of Hours Spent on Internet	Less than 1 hour	1-2 hours	2-3 hours	More than 3 hours	
G Number of Times You Check Your Mobile per Hour	Less than 5 times	5-10 times	11-15 times	More than 15 times	
H What do you use the device for? (You can choose more than one).	WhatsApp 1	Facebook 2	Twitter 3	Snapchat 4	
	Instagram 5	Blogging and Vlogging 6	Reading e-Books 7	Education 8	
	News 9	Sports 10	YouTube and other video apps 11	Religion 12	
	Others 13				
I Do you have any of the following?	Anxiety 1	Depression 2	Addiction 3	Stomach upset 4	
	Headache 5	Eating disorders 6	Neck pain 7	Back pain 8	
	Dry eye 9	Visual disturbances 10	Sleep disturbances 11	Family problems 12	
	Other health issue 13				
J How important are digital devices to you?	Very important 1	Important 2	Necessary 3		
K Do you think you could live without digital devices?	Yes 1	No 2	Cannot answer 3		

	Number of Participants	**Percentage of Participants** (%)
Age Group		
18-25	144	94.1
26-35	8	5.2
36-45	0	0.0
46-55	0	0.0
55-65	1	0.7
Total	**153**	**100.0**

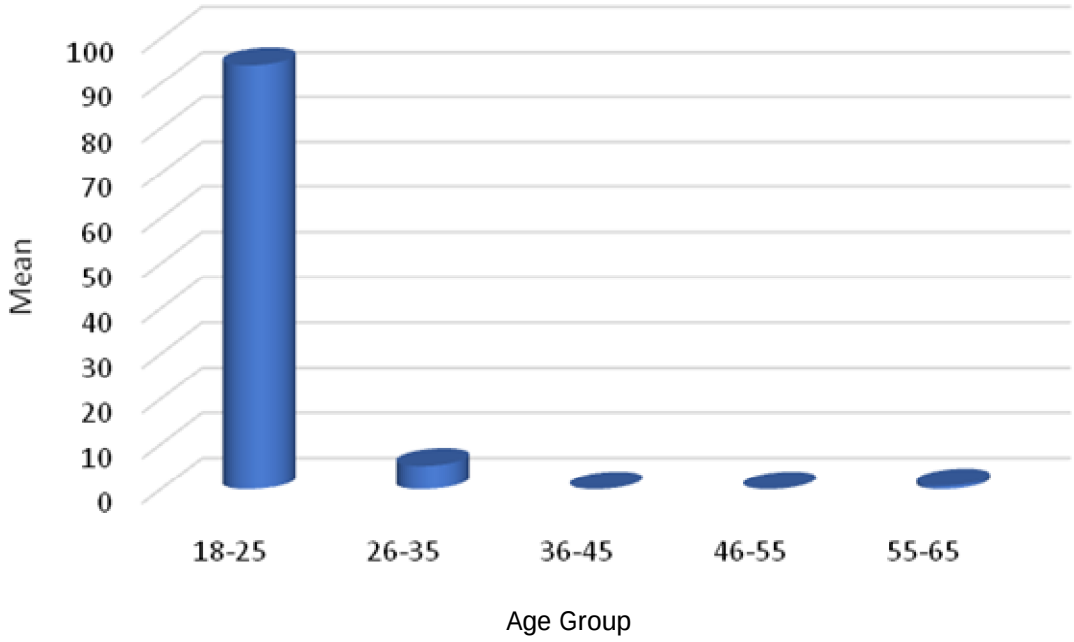

Figure 1: Distribution of the studied group regarding age

Materials and Methods

This study was conducted among the students of various health-related branches like medical, nursing, and dental.

1. **Questionnaire:** (**Figure 1**) A team consisting of the rank of assistant professor and students from different specialties framed a questionnaire. The questionnaire was based on the various aspects of the internet and digital usage using common questions. It consisted of a total of 10 questions, with 7 directly related to internet usage.

   Students received the questionnaire through WhatsApp groups. Everyone was given the option to participate or not. Replying to the questionnaire was taken as voluntary participation. No participant needed to disclose his or her personal details like their name, address or email. The questionnaire was sent to more than 300 students/staff within different colleges and both sexes, but unfortunately, it was mainly the girls who replied. We received a reply from 153 participants only.
2. **Collection of Data:** The data received from the questionnaire were entered in Microsoft Excel by three student editors. All the data entered was doubly checked.
3. **Analysis of Data:** The data collected was analysed with the help of the Bio-statistics department of the university.

Table 2: Distribution of the studied group regarding sex

Sex	**Number of Participants**	**Percentage of Participants** (%)
Female	139	90.9
Male	14	9.1
Total	**153**	**100.0**

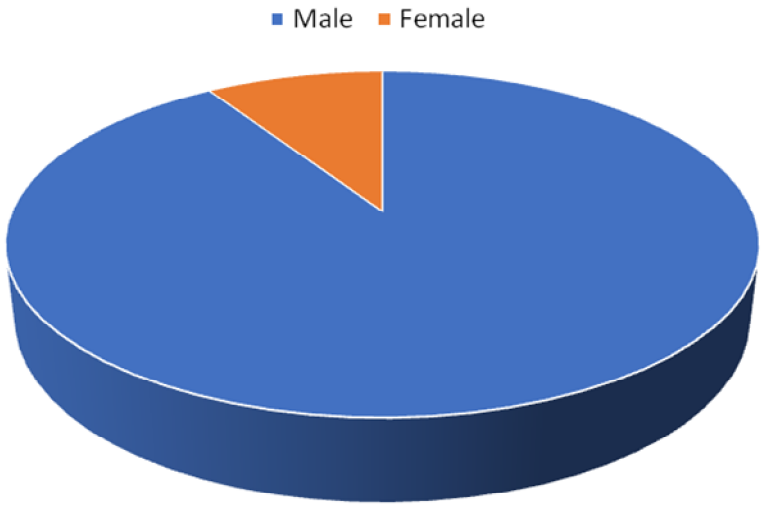

Figure 2: Distribution of the studied group regarding sex

Table 3: Distribution of the studied group regarding marital status

Marital status	**Number of Participants**	**Percentage of Participants** (%)
Single	143	93.5
Married	10	6.5
Total	**153**	**100.0**

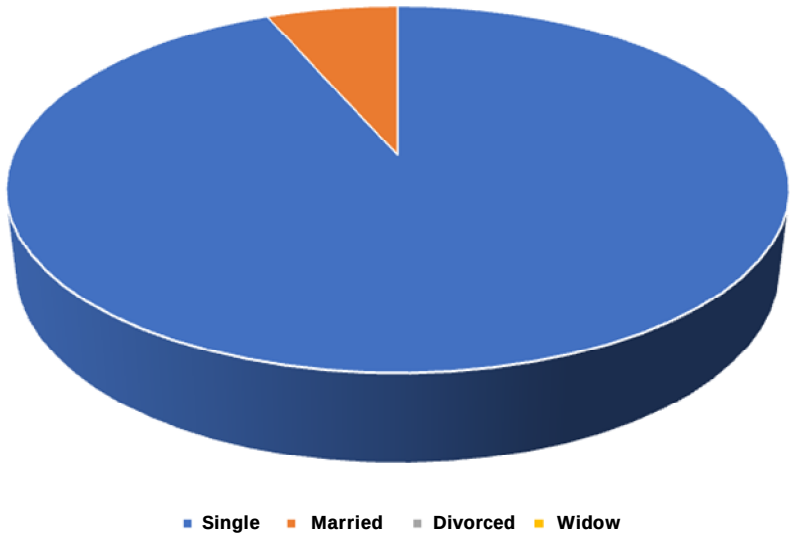

Figure 3: Distribution of the studied group regarding marital status

Table 4: Distribution of the studied group regarding college

College	Number of Participants	Percentage of Participants (%)
Medical	139	90.8
Dental	9	5.9
Pharmacy	2	1.3
Applied Medical Sciences	3	2.0
Total	**153**	**100.0**

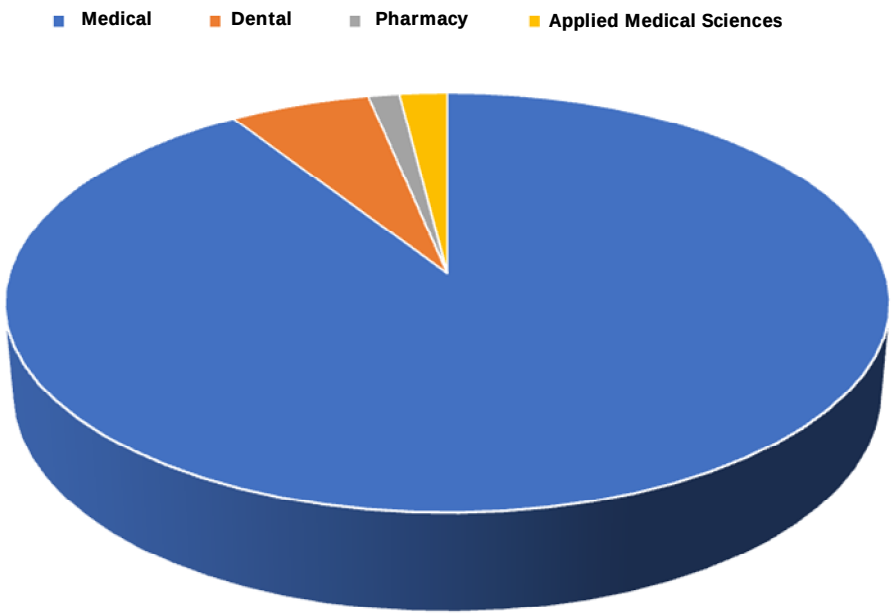

Figure 4: Distribution of the studied group regarding college

***Table* 5:** Distribution of the studied group regarding job

Job	Number of Participants	Percentage of Participants (%)
Student	150	98.0
Faculty member	0	0.0
Other staff	3	2.0
Total	**153**	**100.0**

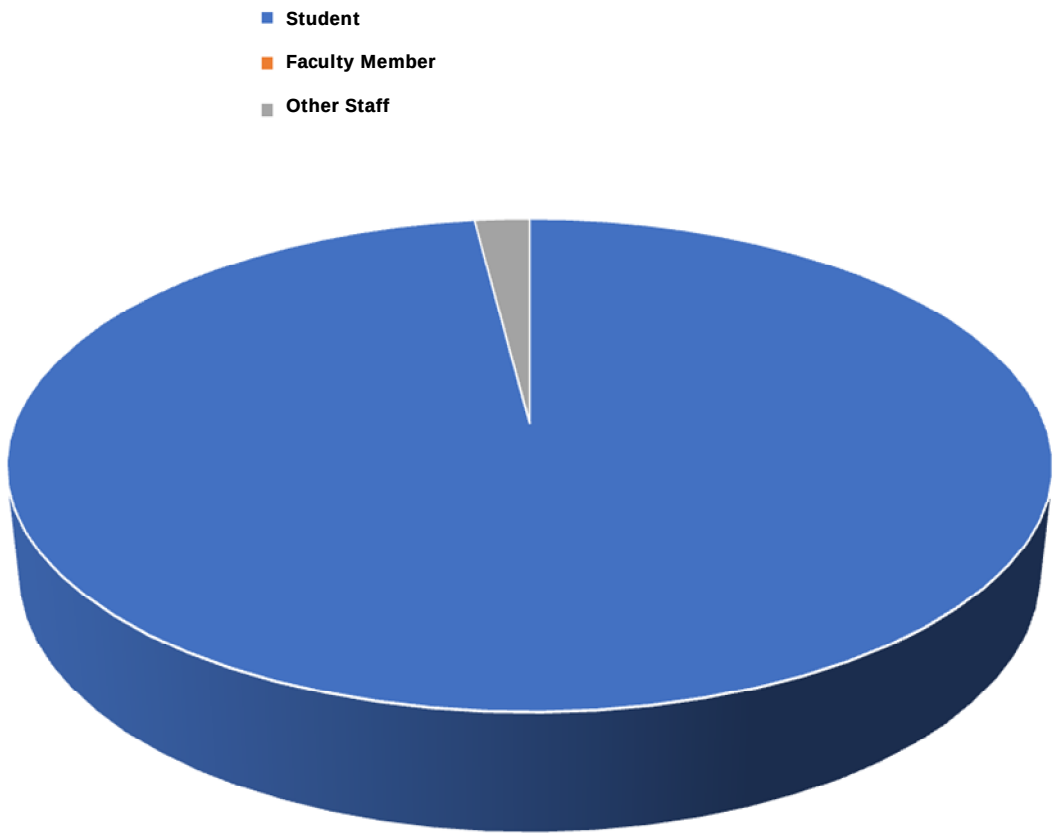

Figure 5: Distribution of the studied group regarding job

Table 6: Distribution of the studied group regarding job

Number of Hours Spent on the Internet per Day	Number of Participants	Percentage of Participants (%)
<2 hrs	36	23.53
2-5	62	40.52
5-10	22	14.38
>10	33	21.57
Range Mean S.D.	1-14 4.21 3.22	
Total	**153**	**100.0**

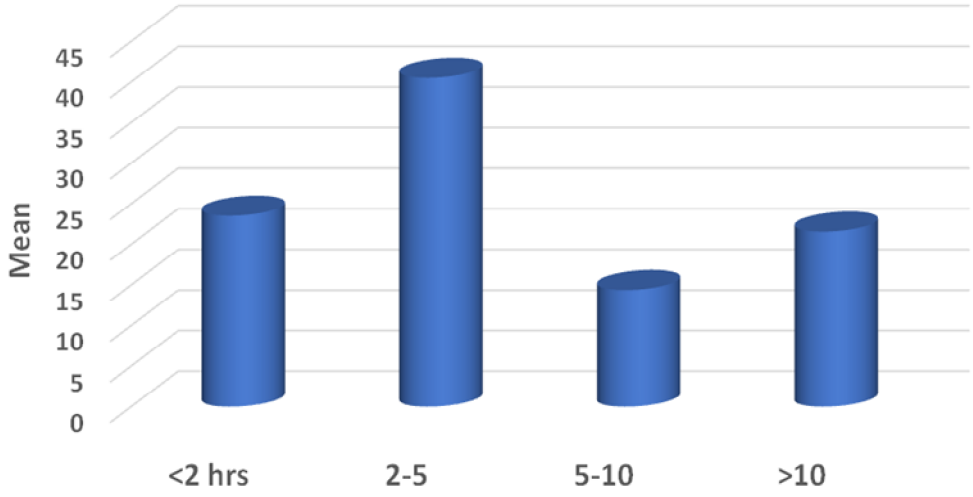

Figure 6: Distribution of the studied group regarding the number of times they check their mobile per hour

Table 7: Number of Times You Check Your Mobile per Hour

Number of Times You Check Your Mobile per Hour	Number of Participants	Percentage of Participants (%)
<1	39	25.49
1-3	45	29.41
4-6	36	23.53
6-10	21	13.73
>10	12	7.84
Total	**153**	**100.0**

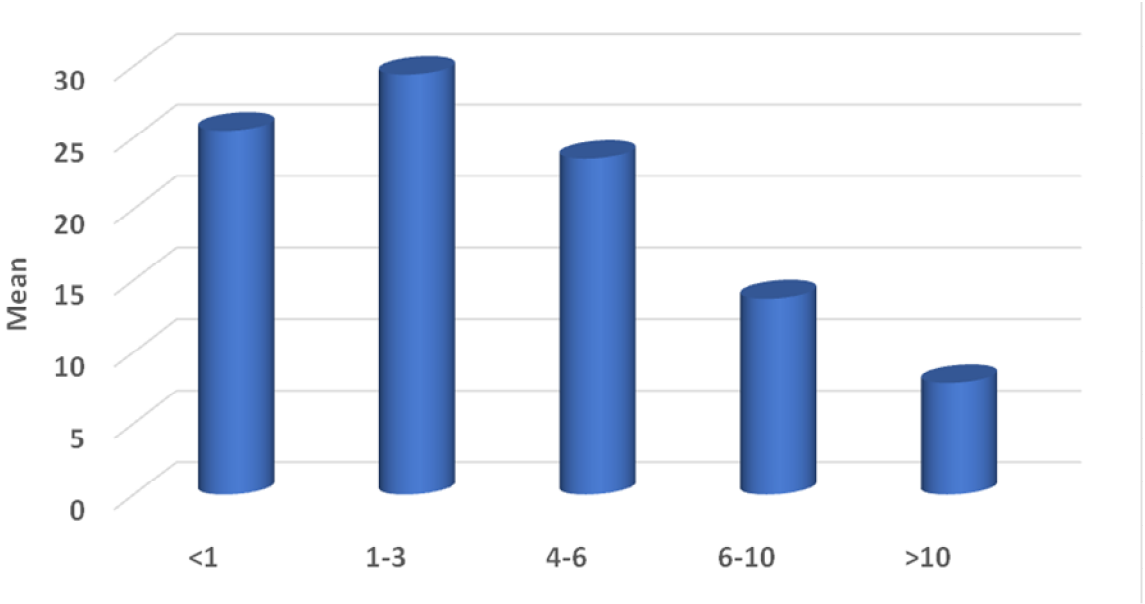

Figure 7: Distribution of the studied group regarding the number of times they check their mobile per hour

Table 8: Distribution of the studied group regarding what they use their device for

What do you use your device for?	Number of Participants	Percentage of Participants (%)
WhatsApp	144	94.12
Twitter	115	75.16
Education	103	67.32
Videos	87	56.86
Games	42	27.45
News	41	26.80
Sports	21	13.73
Religion	19	12.42
Facebook	12	7.84
Others	25	16.34
Total	**153**	**100.0**

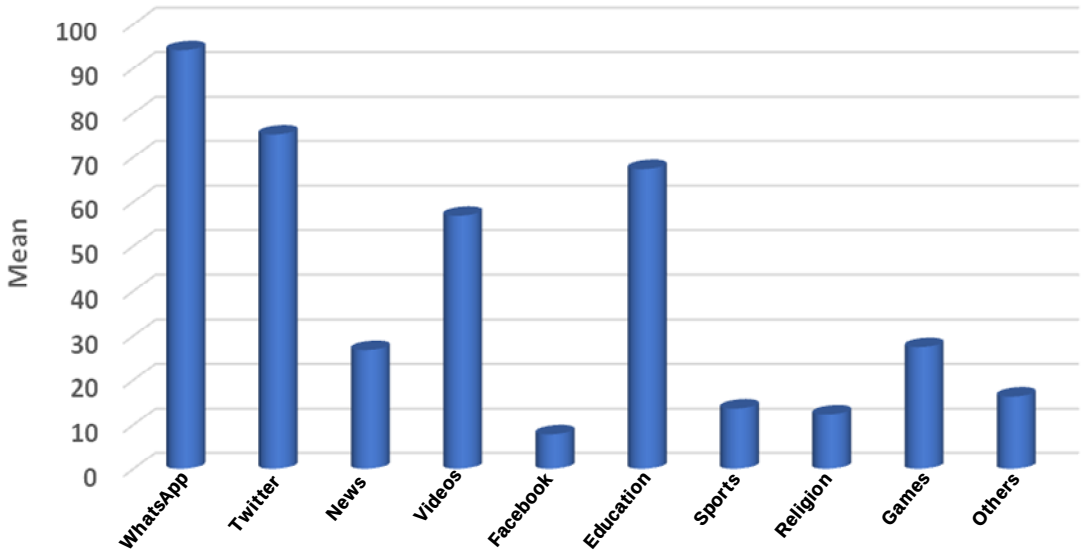

Figure 8: Distribution of the studied group regarding what they use their device for

Table 9: Distribution of the studied group regarding whether they had any of the symptoms provided

Do you have any of the following symptoms?	Number of Participants	Percentage of Participants (%)
Sleep disturbance	65	42.48
Anxiety	53	34.64
Dry eye	48	31.37
Headache	47	30.72
Visual disturbance	44	28.76
Back pain	38	24.84
Depression	37	24.18
Neck pain	31	20.26
Eating disorder	25	16.34
Stomach upset	22	14.38
Family problems	22	14.38
Any other health issue	9	5.88
Total	**153**	**100.0**

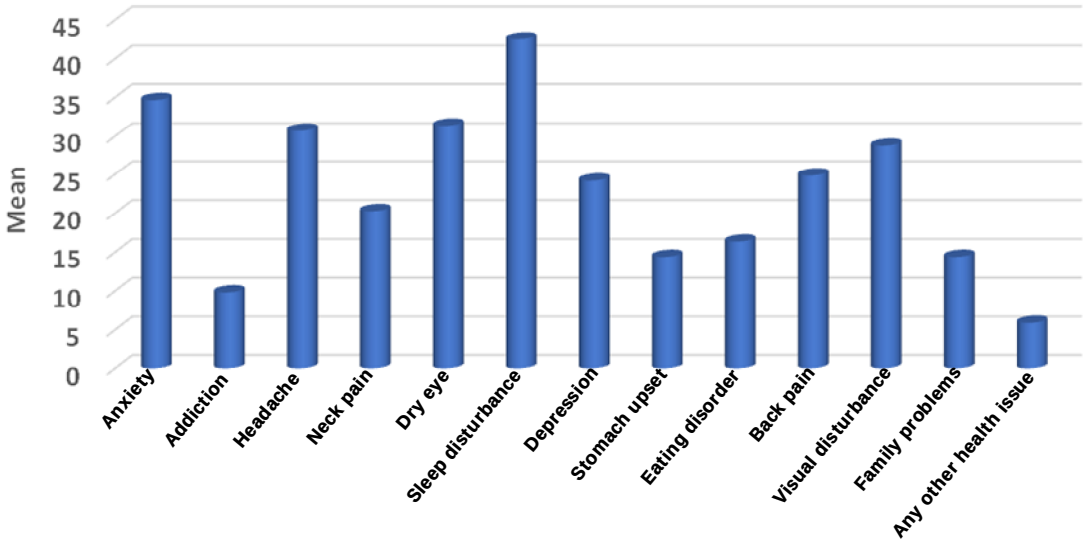

Figure 9: Distribution of the studied group regarding whether they had any of the symptoms provided

Table 10: Distribution of the studied group regarding the number of psychological complaints

Number of Psychological Complaints	Number of Participants	Percentage of Participants (%)
One	18	11.8
Two	29	19.0
Three	66	43.1
Four	33	21.6
Five	10	6.5
Total	**153**	**100.0**

Table 11: Distribution of the studied group regarding the importance of digital devices

How important are digital devices to you?	Number of Participants	Percentage of Participants (%)
Very important	68	44.4
Important	52	34.0
Necessary	33	21.6
Total	**153**	**100.0**

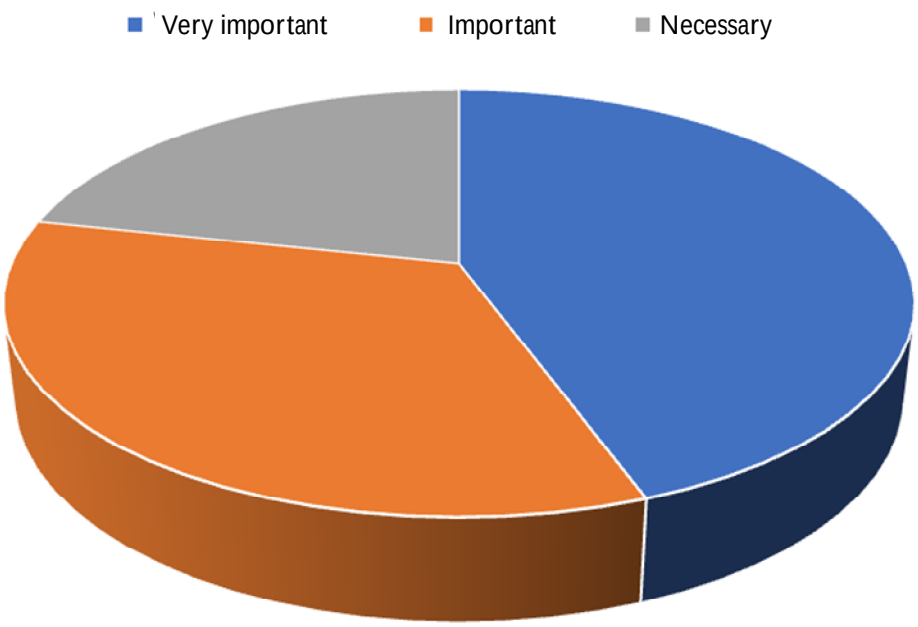

Figure 10: Distribution of the studied group regarding the ability to live without digital devices

Table 12: Distribution of the studied group regarding the ability to live without digital devices

Do you think you could live without digital devices?	Number of Participants	Percentage of Participants (%)
Yes	47	30.7
No	64	41.8
Cannot answer	42	27.5
Total	**153**	**100.0**

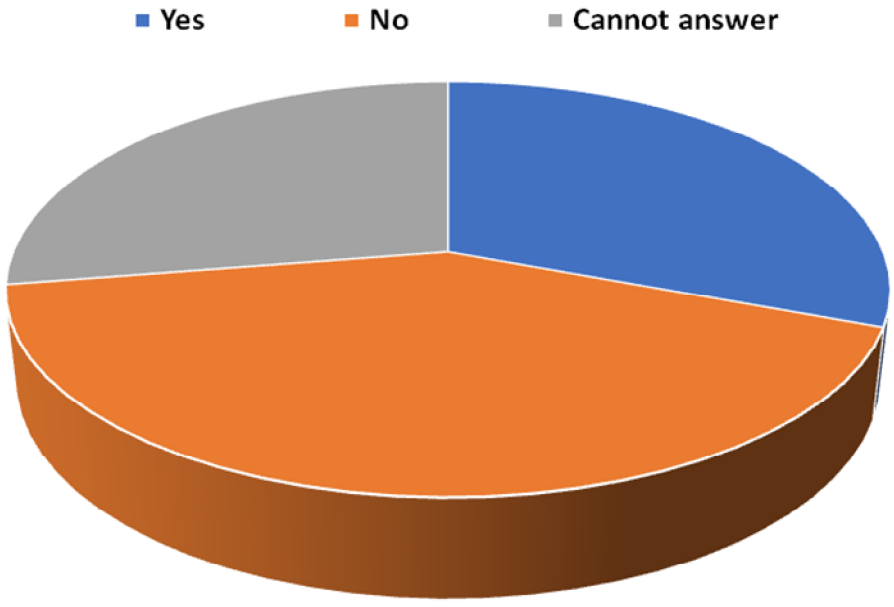

Figure 11: Distribution of the studied group regarding the ability to live without digital devices

Table 13: Relationship between the number of symptoms and gender

	Number of Psychological Complaints								Total		P-value
	One "n=18"		Two "n=29"		Three "n=66"		Four or more "n=43"				
Sex	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	
Male	16	88.9	24	82.8	60	90.9	39	90.7	139	90.9	0.152 N.S.
Female	2	11.1	5	17.2	6	9.1	1	2.3	14	9.1	

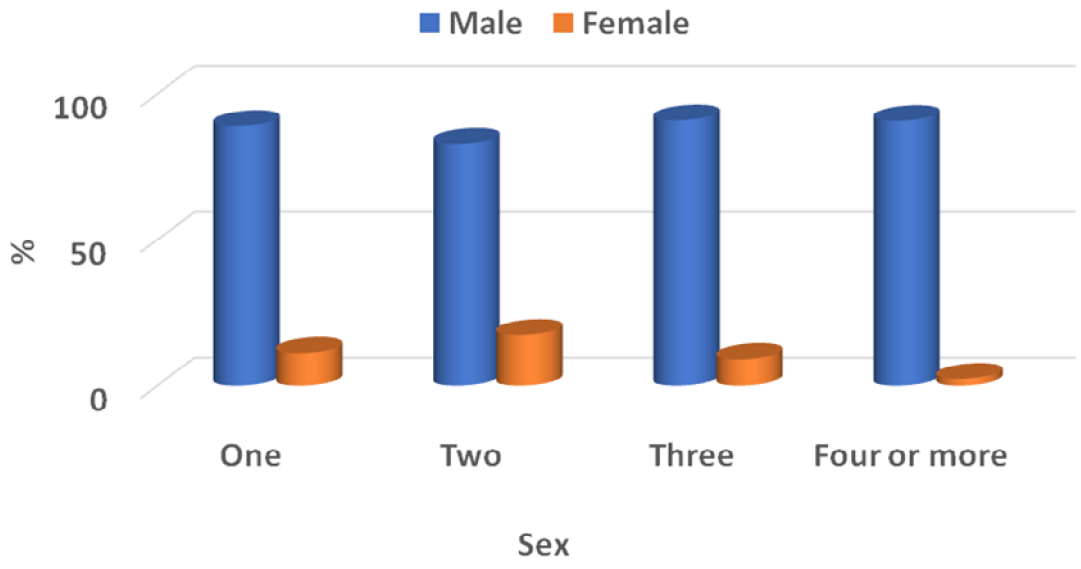

Figure 12: Relationship between the number of symptoms and gender

Table 14: Relationship between the number of symptoms and the participant's place of study

	Number of Psychological Complaints								Total		P-value
	One "n=18"		Two "n=29"		Three "n=66"		Four or more "n=43"				
College	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	
Medical	16	88.9	27	93.1	65	98.5	31	72.1	139	90.8	
Dental	1	5.6	2	6.9	1	1.5	5	11.6	9	5.9	
Pharmacy	1	5.6	0	0.0	0	0.0	1	2.3	2	1.3	
Applied Medical Sciences	0	0.0	0	0.0	0	0.0	3	7.0	3	2	0.211 N.S.

Table 15: Relationship between the number of symptoms and the number of hours spent on the internet per day

	Number of Psychological Complaints								Total		P-value
	One "n=18"		Two "n=29"		Three "n=66"		Four or more "n=43"				
Number of Hours Spent on the Internet per Day	No.	%	No.	%	No.	%	No.	%	No.	%	
<2 hrs	18	100.0	7	24.1	11	16.7	0	0.0	36	23.53	0.0001*
2-5	0	0.0	14	48.3	36	54.5	12	27.9	62	40.52	
5-10	0	0.0	8	27.6	10	15.2	4	9.3	22	14.38	
>10	0	0.0	0	0.0	9	13.6	24	55.8	33	21.57	

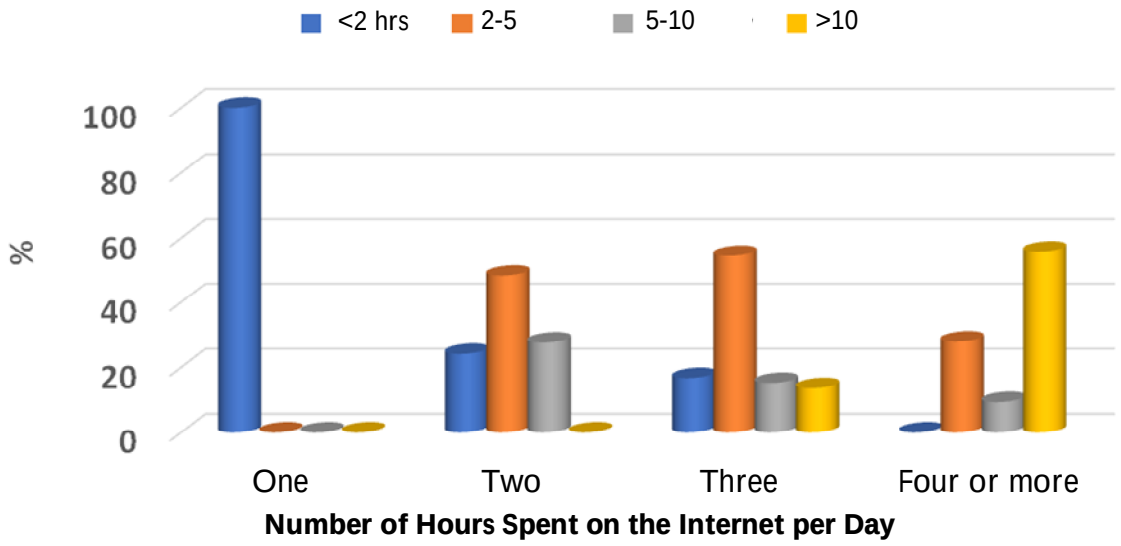

Figure 13: Relationship between the number of symptoms and the number of hours spent on the internet per day

Table 16: Relationship between the number of symptoms and the number of times one checks their mobile per hour

	Number of Psychological Complaints								Total		P-value
	One		Two		Three		Four or more				
	"n=18"		"n=29"		"n=66"		"n=43"				
Number of Times You Check Your Mobile per Hour	No.	%	No.	%	No.	%	No.	%	No.	%	
<1	18	100.0	20	69.0	1	1.5	1.5	0	39	25.49	0.001*
1-3	0	0.0	8	27.6	27	40.9	40.9	10	45	29.41	
4-6	0	0.0	1	3.4	20	30.3	30.3	15	36	23.53	
6-10	0	0.0	0	0.0	18	27.3	27.3	3	21	13.73	
>10	0	0.0	0	0.0	0	0.0	0.0	12	12	7.84	

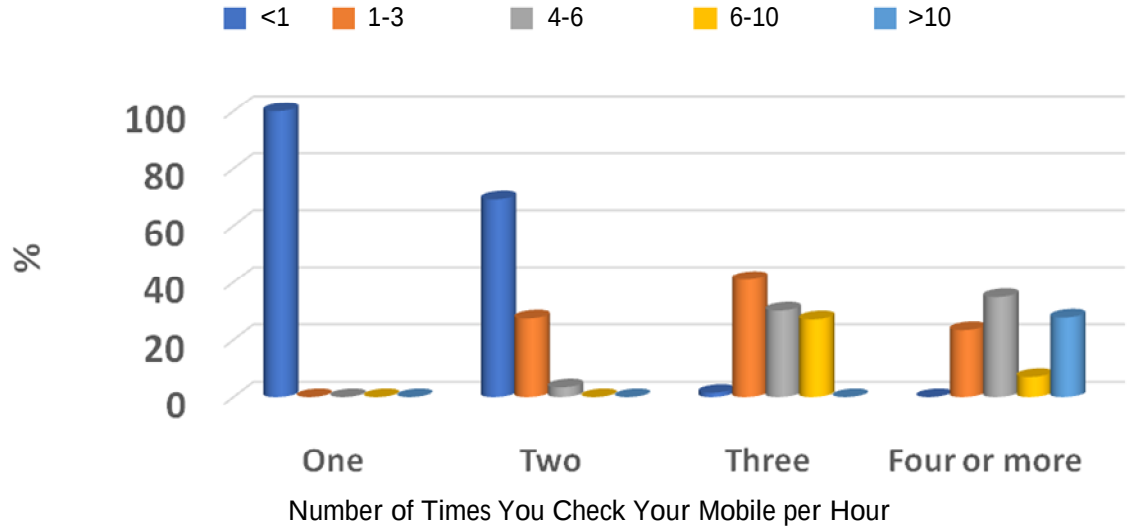

Figure 14: Relationship between the number of symptoms and the number of times one checks their mobile per hour

Results

1. The total number of student respondents were 153. The majority of students belonged to the age group of 18-25 (94.1%). (**Table 1** and **Figure 1**).
2. **Sex:** Most of the respondents were females (90.9%). (**Table 2 and Figure 2**).
3. **Marital Status:** The majority of subjects were single (93.5%). (**Table 3 and Figure 3**).
4. **Technical Background**: More than half of the participants (90.8%) were students at Medical School, followed by students at Dental School (5.9%); the remaining were from Allied Medical Sciences branches (**Table 4** and **Figure 4**).
5. **Staff/Student:** The majority of the respondents were students (98%) as presented in **Table 5 and Figure 5**.
6. **Duration of Usage**: 23.53% participants stated that they used the internet for an average of 2 hours. 40.52% of respondents used the internet from 2-5 hours per day followed by 14.38% respondents who stated that they were using the internet for 5-10 hours per day. Strikingly, about 21.57% respondents were using the internet for more than 10 hours per day (**Table 6 and Figure 6**).
7. **Repeated Mobile Phones Checking:** As for checking their mobile per hour, 29.41% of subjects checked their phones 1-3 times per hour, 25.49% checked their phones once per hour, 23.53% of subjects checked their phones 4-6 times per hour, 13.37% of subjects checked their phones 6-10 times per hour while 7.84% of subjects used their phones more than 10 times per hour (**Table 7 and Figure 7**).
8. **Applications Used (More Than One Answer):** The percentage of the most commonly used applications on mobiles were WhatsApp (94.12%), followed by Twitter (75.16%); 67.32% used phones for education and 56.86% used phones for watching videos. **(Table 8 and Figure 8).**
9. **Symptoms/Complaints:** As for the symptoms of using phones, the results are presented in **Table 9 and Figure 9.** Most of the participants (42.48%) suffered from sleep disturbance, followed by anxiety (34.64%), dry eye (31.37%), headache (30.72%) and visual disturbance (28.76%).
10. **Number of Complaints:** The study reveals that most of the subjects (43.1%) suffered from at least 3 complaints, 21.6% suffered from 4 complaints and 19% suffered from 2 complaints, while only 6.5% suffered from 5 complaints and 11.8% suffered from one complaint. (**Table 10**)
11. **Digital Dependence:** Most of the subjects (44.4%) thought that digital devices are very important for their lives, 34% of subjects thought it is important for their life and 21.6% rated digital devices as necessary for their life (**Table 11**). Most of the subjects (41.8%) answered that they can't live without their devices, 30.7% said yes they can live without their devices while 27.5% can't answer this question (**Table 12**).
12. **Correlation Between the Subjects Demographics and the Symptoms of Using Digital Devices:** There was no significant difference between the number of complaints and the gender and college (**Table 13** and **14**). On the other hand, the higher the number of hours spent on the internet, the higher the number of psychological complaints with a significant relationship (**Table 15**). **Table 16** showed a significant relationship between the number of psychological complaints and the higher number of times checking their mobile.

Discussion

In the present era, our lives have a very heavy dependence on various digital technologies for information, inter-personal relationships, entertainment, and even financial transactions. As there is now over-dependence on digital technology, it often results in addiction. It was Goldberg[2] who coined a term for pathological use of the internet, terming it "Internet Addiction Disorder (IAD)". Digital addiction is not different from other addictions; those suffering from it exhibit compulsive behaviour and often use the virtual fantasy world as a substitution for real-life human connection. Even though all true effects are not known, it has been established that the life of an addicted user leads to social isolation, anxiety, depression, immune system disruption, brain damage, and even death.

It was Kandell[3] who defined Internet addiction as "a psychological dependence on the Internet, regardless of the type of activity once logged on". As per him, college students as a group appear more vulnerable in developing a dependence on the internet than any other segment of society. The reason he gave was that college students have a strong drive to develop a firm sense of identity and to develop meaningful and intimate relationships. They usually have free and easily accessible connections, and their internet use is implicitly, if not explicitly, encouraged. Although the majority of people use the internet in healthy and productive ways, some college students develop a "pathologic" use of the internet.

In order to compare our results with other studies,

we could not find any previous study dealing with these factors. However, we found many leading news agencies have conducted surveys about digital dependence so we compared mainly with them. In our study, we received the maximum number of responses from female students only. However, previous studies reveal that for public institutes there were no gender differences in the amount of time spent on the internet, however, at private institutions, males spent significantly more time online than females ($p = 0.019$)[4]. The Telegraph News UK published an article, "a decade of smartphones"[5]. The article provides a survey on digital usage; the main points of relevance to our research include that, on average, the maximum usage of internet in the 16-24 age group is 34.3 hours per week. We found that the majority of students in our study belonged to the 18-25 age group (94.1%), but to our surprise, 35% of students were using the internet for more than 5 to 10 hours in a single day. They found that young people also check their phones every 8.6 minutes, which is more frequent than any other age group. We found that the repeated checking was either the same or less in our study, but it may be because the person is already working on their phone for long durations so does not check their phone repeatedly. Regarding the apps or websites used, there is variation. In general, it is usually Facebook, WhatsApp, Instagram, or Twitter which are commonly used throughout the world; this is almost the same as the findings of our group. However, a good point worth noting is that 67.32% admitted that they use the internet for educational purposes as well.

Our study revealed that the most common issue among students was sleep disturbance. A recent review article has found that there is significantly shorter total sleep time with greater mobile device screen time reported in 10/12 studies. The same review reports in 5/5 studies a greater subjective day-time tiredness or sleepiness[6]. Studies have revealed a moderate evidence of association in about 34.64% of subjects[7]. Dry eyes and visual disturbances were also a major presentation in the study group. It has recently been established that individuals in possession of a mobile phone for more than 2 years are at a significantly increased risk of blurred vision ($p<0.05$) compared to users in possession of a mobile phone for fewer than 2 years[8]. In users of mobile phones, women complained significantly ($p<0.05$) more often of inflammation in the eyes than men[8]. Headache was complained about by 30.72% of students. The headache associated with mobile phone usage is called HAMP (headache associated with mobile phones). It is defined as a headache attack during mobile phone use or within 1 hour after mobile phone use. A study concluded that HAMP usually showed stereotyped clinical features including mild intensity, a dull or pressing quality, localisation ipsilateral to the side of mobile phone use, provocation by prolonged mobile phone use and was often accompanied by a burning sensation[9].

We found that most of the subjects (41.8%) answered that they can't live without their devices. We also found from our study that the more time spent on mobile and other digital devices, the greater the number of associated psychological issues.

Conclusion

The study revealed a very serious trend in terms of the time spent by students on the internet and the associated adverse health issues, with evidence of dependence in a subset of students. Despite the size being low and limited to a well-defined group, we recommend that the need of the hour is to act at three different levels. Students at the individual level need to be educated about the proper use of the internet and digital devices at the induction phase when they are most receptive. At the university level, proper software or applications need to be made so that students and staff can access relevant websites and apps within the university campus. At the society level, the educational and health sector needs to play a vital role so that masses are made aware of the individual, social, and health issues associated with improper and overuse of digital technology.

Limitations

There are two major shortcomings in this study. The first one is that the sample size is low and represents trends in a very specific group of students. The second one is that we did not look into internet usage and the impact on student grades and other educational achievements. We really feel any further studies would be quite helpful in understanding this new aspect of digital revolution and deciding whether it is boon or bane.

Conflict of Interest

All the authors declare there is no conflict of interest among them.

Funding

This study did not receive any funding from any source.

Acknowledgement

MW designed the study, questionnaire and wrote the paper. LF, NF, AA modified the questionnaire

and collected all the data. ZB helped in writing and the final formatting of paper.

References

1. Griffiths M. (2000). Does Internet and Computer "Addiction" Exist? Some Case Study Evidence. Cyberpsychology & behavior, 2 (3), 217
2. Goldberg, I. (1996). Internet Addiction Disorder. Retrieved November 24, 2004 from http://www.rider.edu/~suler/psycyber/supportgp.html.
3. Jonathan J. Kandell. Internet Addiction on Campus: The Vulnerability of College Students. CyberPsychology & Behavior. Vol 1, No. 1.
4. Odell, P. M., Korgen, K. O., Schumacher, P., & Delucchi, M. (2000). Internet use among female and male college students. CyberPsychology & Behavior, 3(5), 855-862.
5. A decade of digital dependency 02 August 2018.Ofcom, UK (Ofcom is the regulator for the communications services that we use and rely on each day.) published data in 2018
6. Neza Stiglic, Russell M Viner .Effects of screentime on the health and well-being of children and adolescents: a systematic review of reviews. BMJ Open 2019;9:e023191. doi:10.1136/ bmjopen-2018-023191
7. Hoare E, Milton K, Foster C, et al. The associations between sedentary behaviour and mental health among adolescents: a systematic review. Int J Behav Nutr Phys Act 2016;13:108.
8. Küçer N1. Some ocular symptoms experienced by users of mobile phones. Electromagn Biol Med. 2008;27(2):205-9. doi: 10.1080/15368370802072174.
9. Chu MK1, Song HG, Kim C, Lee BC. Clinical features of headache associated with mobile phone use: a cross-sectional study in university students. BMC Neurol. 2011 Sep 26;11:115.

Medical Education
DAUIN 20190161

World Journal of Medical Education and Research:
An Official Publication of the Education and Research Division of Doctors Academy

The Perceived Role of Community-Based Medical Education Among Kenyan-Trained Medical Doctors' Choice of Rural Practice

Chege PM

Institution
Moi University, Usain Gishu County, Academic Highway, Eldoret, Kenya

WJMER, Vol 21: Issue 1, 2019

Abstract

Background: The recruitment and retention of doctors in rural and remote areas remain a challenge, leading to inequity favoring urban populations worldwide. Sub-Saharan Africa suffers a major challenge related to doctors not working in rural areas where over 60% of their population reside. The influence of community-based medical education (CBME) on medical doctors and rural practice has been documented in a few countries except Kenya.
Objective: To determine the perceived role of CBME in the choice of rural practice among Kenyan-trained doctors.
Study Design and Methods: An analytical cross-sectional study design was used. Six cohorts of medical graduates of the years 2000, 2001 and 2002 from Nairobi University and Moi University were interviewed.
Google forms were used to email the study questionnaires to the participants.
Results: The eligible number of participants for each cohort was 96, 83 and 90 for Nairobi University graduates and 49, 40 and 41 for Moi University graduates for the years 2000, 2001 and 2002 respectively. The response rates were 35.8% (45.8, 19.3, 42.2%) and 38% (32.7, 27.5, 53.7%) for years 2000, 2001 and 2002 for Nairobi and Moi University participants respectively. Factors found to be associated with a positive perception included: the medical school, rural upbringing, parents' level of education, and early rural posting. After multivariate analysis for confounders, it was observed that the medical school the participant graduated from was significantly associated with a positive perception on the role of CBME in the choice of rural practice [Moi University = 73.5 (95% CI: 60.6, 86.3) vs. Nairobi University = 45.9 (95% CI: 35.9, 56.6) chi-square, p-value =0.002].
Conclusions: CBME played a positive role in the study participants' choice of rural practice.

Key Words

Role of Community-Based Medical Education; Choice of Rural Practice; Kenyan-Trained Doctors

Corresponding Author:
Mr Patrick M Chege; E-mail: chege200851@yahoo.com

Background

The recruitment and retention of healthcare professionals, especially doctors, in rural and remote areas remains a major challenge and a contributor to inequity in healthcare services provision that favours urban populations worldwide. Also skewed, in favour of the urban centers, is the distribution of health facilities. This is particularly worrying in developing countries, especially those in Sub-Saharan Africa (SSA)[1-4].

Governments and global healthcare leaders have developed initiatives and strategies to improve the attraction and retention of healthcare workers in underserved areas in different countries globally, with mixed results of some success and failure.

Over the years, the government of Thailand has used various strategies to increase the number of doctors serving in rural underserved areas. These strategies have involved coercion and financial and non-financial incentives. Coercion involves a compulsory three-year service in rural Thailand after medical training. Financial incentives include supplemented income with hardship allowances, non-private practice and professional allowances. The non-financial incentives include preferential consideration in promotion and increased opportunity for specialist training.

In 1994 the Thailand Ministry of Health and some medical schools developed an initiative that involved selecting cohorts of medical students to spend their clinical years of training in rural health facilities. After medical training, members of these cohorts would be posted to work in the same facilities. This

initiative was a collaborative effort between the medical schools and the Ministry of Health of Thailand[5, 6]. The positive outcomes of this initiative have been documented[7].

Sub-Saharan Africa (SSA) has many documented challenges that result from the unavailability of doctors and other health workers in rural areas where over 60% of the population lives. A significant number of these doctors also leave their native African countries to work in Europe, United States of America, Canada and other countries that pay better than their own. This problem is compounded by the fact that medical schools in SSA are few and with limited capacity for enrolment of trainees. The number of non-African doctors interested in working in SSA is very small[8].

Strategies that have been employed to retain doctors in some SSA countries include coercion, which involves bonding of medical graduates to serve in underserved areas for at least two years after medical training and internship. Other means involve financial incentives that include higher salaries and allowances. The World Health Organization policy, implemented by ministries of education and health, promotes the enhancement of community-based medical education (CBME) by making it a core course in the curriculum for undergraduate and graduate medical programmes[2, 7, 9].

Some countries have documented that CBME during undergraduate medical training played a positive role in attracting more medical doctors to rural practice.

In Australia, offering medical education and training with important insights into factors affecting preference for future rural practice has resulted in increased recruitment and retention in these rural areas[10].

In Uganda, medical graduates of the Makerere College of Health Sciences who went through the medical training curriculum with community education and service (COBES) component spiraled in all levels of the training programme reported that COBES made them confident health workers in primary healthcare, especially when serving rural communities in Uganda[11].

In Kenya, health workers from three different underserved contexts were interviewed about the challenges they faced and what made it difficult for facilities in these areas to attract and retain workers. These different facilities were in Turkana (arid part of northern Kenya), Machakos (borders Nairobi but has a large semi-arid portion) and Kibera (the largest slum in Nairobi, the capital city of Kenya). The factors that the health workers in these facilities attributed to poor attraction and low retention included low salaries, female workers finding it difficult to work in this environment, level of training (highly trained personnel avoided these areas), suboptimal working environment due to poor allocation of resources, work overload among the few available workers, among many others issues[12].

The Nairobi and Moi University medical schools are the oldest in Kenya, having been started in 1967 and 1989 respectively. The other approved public medical schools are in the universities of Kenyatta, Maseno, Egerton and Jomo Kenyatta University of Agriculture and Technology. Approved private medical schools are Kenya Methodist University, Uzima University and Mount Kenya University. Except for Nairobi and Moi University medical schools, the rest have developed within the last decade. Aga Khan University Hospital in Nairobi offers Masters of Medicine (MMed) programmes as a private university but does not have a medical school. Nairobi and Moi Universities also offer Masters of Medicine (MMed) and clinical fellowship programmes.

The Nairobi University School of Medicine (NUSOM) and the Moi University School of Medicine (MUSOM) both offer medical training curricula that have CBME as core courses in the medical training curricula.

Moi University offers spiral community-based education and service (COBES) courses in five of the six years of medical training. During the last decade, Nairobi University has started to offer community health courses in level two and five of the six levels of training. Before then, community health was offered only in fourth year of medical training.

My study explored what the medical graduates perceived as the role of CBME on the individual doctor's choice of rural practice.

Methods

Study Site: The study was carried out in Moi University School of Medicine while data were collected from participants using their contact details provided by the Kenya Medical Practitioners and Dentists Board (MP&DB) register. Other available medical directories were also used to complement the medical board contact details.

The implementation of the Nairobi University medical school community health course for medical students was accessed on the Nairobi

University School of Public Health webpage while the Moi University medical school community-based education and service (COBES) course for medical students was accessed from the School Curriculum Implementation and Evaluation Committee (CIEC) secretariat.

Study Design: An analytical cross-sectional study design was used to study both the exposure and outcome of CBME among Kenyan-trained medical doctors. Six cohorts of medical graduates (three from Moi University and three from Nairobi University) who graduated in years 2000, 2001 and 2002 participated in the study.

Target Population: Medical graduate cohorts of years 2000, 2001 and 2002 from Moi and Nairobi Schools of Medicine. These cohorts were conveniently selected as medical doctors who were likely to have a significant degree of career stability and also beneficiaries of innovative medical education teaching and learning methods in these two oldest Kenyan medical schools.

Sample Size Determination and Sampling Procedures

The target population was small. All members of these cohorts were eligible to participate. The contact addresses and telephone numbers of the participants were provided by the Kenya Medical Practitioners and Dentists Board (MP&DB) secretariat and were supplemented by the Kenyan medical directories.

The study population (see table below) was small and all members of the different cohorts were eligible to participate.

Table 1: Illustration of the cohorts

Medical School	Medical Graduate Cohorts of Year 2000	Medical Graduate Cohorts of Year 2001	Medical Graduate Cohorts of Year 2002	Total
Moi University School of Medicine	49	40	41	130
Nairobi University School of Medicine	96	83	90	269
Total	145	123	131	399

Data Collection Procedures

The offices of the Deans of Nairobi and Moi medical schools were approached for authority to conduct the study and access to the alumni lists. The Kenyan medical board secretariat authorised access to the contact details of the participants.

The participants preferred online participation through Google Forms which were used to get consent and questionnaires **(See appendix).**

Responses were received within a short period of the participants finishing.

Data Management, Analysis and Presentation of Results

The Google Form responses were saved in MS Excel database. Reminders to participants were sent in the form of repeated email reminder messages, short text messages and telephone calls within six months.

It was not possible to determine who among the non-respondents were still residing in Kenya or whether they were alive or dead. The annual retention register of the Kenyan medical board bears only the names of doctors who pay up annual retention fees.

Data were exported to International Business Machines (IBM) Statistical Package for Social Sciences (SPSS) version 21 for analysis. Fisher's Exact test was used in the analysis of the categorical data. The data was categorical in 2 by 2 contingency tables. The sample sizes were small and the expected values were small. Chi-square test was used to test for association in the categorical variables. Multivariate analysis was used for confounders. The level of significance α was arbitrarily taken as 0.05 with 95% Confidence Interval (CI). Results were presented in frequency tables.

Ethical Considerations

Ethical approval was sought and granted by the Institutional Research and Ethics Committee (IREC) of Moi University.

Permission to conduct the study was sought and granted from the Deans of Nairobi and Moi University medical schools.

Informed consent was sought from all the participants. The names of the interviewees were not revealed on the database and confidentiality was maintained.

Data are stored in password protected folders and will be destroyed as guided by the rules and regulations of IREC.

Study Limitations

1. Dependence on recall by participants was foreseen as a limitation. This was minimised by limiting the questions to major events and avoiding questioning details on specific community -based rotations. The tool had been pretested on medical graduates from as long as four decades before my study and compared with those of the last decade. No significant variation was noted on the responses among various cohort members during the pretest.
2. The response rate of less than 50% of the study was a limitation. This use of a denominator as provided by alumni lists of more than 15 years may be misleading. My study did not sample but aimed to have all members of the six cohorts participate. The most recent available contact details as provided by the Kenya Medical Practitioners and Dentists Board. Vital statistics, though updated in Kenya for new entrants, fall short because challenges in updating losses through migration and even death. It was noted that similar studies had published findings of response rates lower than 50%. The low response rates may also be attributed to medical graduates' reluctance to participate in activities outside their clinical duties.
3. The use of online self-administered questionnaires may have the disadvantage of the respondents' controlling their responses without the researcher's involvement. During the pretest, responses of interviewer-administered interviews were compared to the online responses. There was no significant difference between the two that could affect the objectives of this study.

Results

The study was conducted between February and September 2018.

The response rate was calculated against the list provided by the respective medical schools. A significant proportion of these graduates were not on the current Kenyan medical board retention register and did not respond to our email and telephone communication that was sent every fortnight. After six months, the effort to get responses from the non-responders was halted.

The eligible number of in each cohort was 96, 83 and 90 for Nairobi and 49, 40 and 41 for Moi University medical schools in the years 2000, 2001 and 2002 respectively. The response rates were 35.8% (45.8, 19.3, 42.2%) and 38% (32.7, 27.5, 53.7%) for Nairobi and Moi University participants respectively for years 2000, 2001 and 2002.

Table 2: Study population characteristics

Variable	Nairobi University	Moi University	Total
	Freq(%)	Freq(%)	Freq(%)
Age in Years			
35-40	24 (24.5)	15 (30.6)	39 (26.5)
41-45	55 (56.1)	31 (63.3)	86 (58.5)
>45	19 (19.4)	3 (6.1)	22 (15)
Gender			
Male	67 (68.4)	28 (57.1)	95 (64.6)
Female	31 (31.6)	21 (42.9)	52 (35.4)
Marital Status			
Single	5 (5.1)	11 (22.4)	16 (10.9)
Married	90 (91.8)	37 (75.5)	127 (86.4)
Divorced	3 (3.1)	1 (2)	4 (2.7)
Year of Graduation			
2000	44 (44.9)	16 (32.7)	60 (40.8)
2001	16 (16.3)	11 (22.4)	27 (18.4)
2002	38 (38.8)	22 (44.9)	60 (40.8)
Employer			
Self	11 (11.2)	7 (14.3)	18 (12.2)
Private institutions	12 (12.2)	8 (16.3)	20 (13.6)
University	27 (27.6)	12 (24.5)	39 (26.5)
Ministry of Health	48 (49)	21 (42.9)	69 (46.9)
Research Institute	0 (0)	1 (2)	1 (0.7)
Post-Medical Training			
None	9 (9.2)	15 (30.6)	24 (16.3)
Masters in Medicine	73 (74.5)	27 (55.1)	100 (68)
Masters in Public Health	11 (11.2)	2 (4.1)	13 (8.8)
Masters in Palliative Care	3 (3.1)	1 (2)	4 (2.7)
PhD	0 (0)	1 (2)	1 (0.7)
Masters in Medicine plus Clinical Fellowship or PhD	2 (2)	3 (6.1)	5 (3.4)
Where did you grow up?			
Rural	78 (79.6)	29 (59.2)	107 (72.8)
Urban	18 (18.4)	19 (38.8)	37 (25.2)
Both	2 (2)	1 (2)	3 (2)
What was your father's level of education?			
None	13 (13.3)	5 (10.2)	18 (12.2)
Primary	18 (18.4)	14 (28.6)	32 (21.8)
Secondary	35 (35.7)	14 (28.6)	49 (33.3)

The study population was youthful with 58.5% of the population aged 41-45 years. Sixty-eight percent of the respondents were Masters of Medicine graduates, the majority of whom worked in public service. Seventy-three percent reported growing up in rural Kenya.

Table 3: Rating the role of the CBME course during the medical training and good skills in early practice

Variable	Nairobi University Freq(%)	Moi University Freq(%)	Total Freq(%)
Rate CBME Year 1			
Poor	0 (0)	5 (10.2)	5 (3.4)
Good	0 (0)	21 (42.9)	21 (14.3)
Very good	0 (0)	11 (22.4)	11 (7.5)
Excellent	0 (0)	12 (24.5)	12 (8.2)
Not applicable	98 (100)	0 (0)	98 (66.7)
Rate CBME Year 2			
Poor	0 (0)	2 (4.1)	2 (1.4)
Good	0 (0)	15 (30.6)	15 (10.2)
Very good	1 (1)	19 (38.8)	20 (13.6)
Excellent	0 (0)	13 (26.5)	13 (8.8)
Not applicable	97 (99)	0 (0)	97 (66)
Rate CBME Year 3			
Poor	0 (0)	5 (10.2)	5 (3.4)
Good	0 (0)	22 (44.9)	22 (15)
Very good	0 (0)	17 (34.7)	17 (11.6)
Excellent	0 (0)	5 (10.2)	5 (3.4)
Not applicable	98 (100)	0 (0)	98 (66.7)
Rate CBME Year 4			
Poor	20 (20.4)	3 (6.1)	23 (15.6)
Good	30 (30.6)	24 (49)	54 (36.7)
Very good	42 (42.9)	15 (30.6)	57 (38.8)
Excellent	6 (6.1)	6 (12.2)	12 (8.2)
Not applicable	0 (0)	1 (2)	1 (0.7)
Rate CBME Year 5			
Poor	1 (1)	5 (10.2)	6 (4.1)
Good	1 (1)	17 (34.7)	18 (12.2)
Very good	1 (1)	17 (34.7)	18 (12.2)
Excellent	0 (0)	8 (16.3)	8 (5.4)
Not applicable	95 (96.9)	2 (4.1)	97 (66)
Rate CBME in Your Competence			
Poor	52 (53.1)	9 (18.4)	61 (41.5)
Good	30 (30.6)	24 (49)	54 (36.7)
Very good	16 (16.3)	13 (26.5)	29 (19.7)
Excellent	0 (0)	3 (6.1)	3 (2)

In Nairobi University School of Medicine, community health was offered only in fourth year with 80% of the Nairobi University medical graduates rating that experience positively. In Moi University School of Medicine, community-based education and service (COBES) was offered in years one to five. The positive rating of COBES was above 90% in all the years except year five (82%). The highest rating was for second year (96%).

Table 4: Rating the role of the CBME course during the medical training and good skills in early practice

Variable	Nairobi University Freq(%)	Moi University Freq(%)	Total Freq(%)	P-value
Rate CBME in the Choice of Early Posting to Rural Hospitals				
Poor	49 (50)	9 (18.4)	58 (39.5)	
Good	32 (32.7)	24 (49)	56 (38.1)	0.001
Very good	17 (17.3)	16 (32.7)	33 (22.4)	
Rate CBME in Rural Practice Choice After Internship				
Poor	53 (54.1)	13 (26.5)	66 (44.9)	
Good	19 (19.4)	13 (26.5)	32 (21.8)	0.002
Very good	26 (26.5)	20 (40.8)	46 (31.3)	
Excellent	0 (0)	3 (6.1)	3 (2)	
CBME Plays a Role in Competence				
Strongly disagree	5 (5.1)	2 (4.1)	7 (4.8)	
Disagree	7 (7.1)	4 (8.2)	11 (7.5)	0.719
Neutral	28 (28.6)	9 (18.4)	37 (25.2)	
Agree	29 (29.6)	16 (32.7)	45 (30.6)	
Strongly agree	29 (29.6)	18 (36.7)	47 (32)	
CBME Plays a Role in Current Rural Practice				
Strongly disagree	6 (6.1)	2 (4.1)	8 (5.4)	
Disagree	19 (19.4)	12 (24.5)	31 (21.1)	0.033
Neutral	40 (40.8)	8 (16.3)	48 (32.7)	
Agree	20 (20.4)	15 (30.6)	35 (23.8)	
Strongly agree	13 (13.3)	12 (24.5)	25 (17)	

CBME was perceived to be significantly associated with choice of early posting to a rural hospital (internship and immediately after internship) and the current choice of rural practice.

***Table* 5**: Rating of the perceived role of CBME in the choice of early rural posting, considering competence and settling into rural practice

	Poor Freq(%)	Good Freq(%)
Medical School		
Nairobi University	53 (54.1)	45 (45.9)
Moi University	13 (26.5)	36 (73.5)
Age in Years		
35-40	15 (38.5)	24 (61.5)
41-45	44 (51.2)	42 (48.8)
>45	7 (31.8)	15 (68.2)
Sex		
Male	43 (45.3)	52 (54.7)
Female	23 (44.2)	29 (55.8)
Marital Status		
Single / Divorced	6 (30.0)	14 (70.0)
Married	60 (47.2)	67 (52.8)
Year of Graduation		
2000	28 (46.7)	32 (53.3)
2001	11 (40.7)	16 (59.3)
2002	27 (45)	33 (55)
Where did you grow up?		
Rural	46 (43)	61 (57)
Urban	19 (51.4)	18 (48.6)
Both	1 (33.3)	2 (66.7)
What was your mother's level of education?		
None	3 (15.8)	16 (84.2)
Primary	30 (56.6)	23 (43.4)
Secondary	13 (33.3)	26 (66.7)
College	20 (55.6)	16 (44.4)
What was your father's level of education?		
None	2 (11.1)	16 (88.9)
Primary	20 (62.5)	12 (37.5)
Secondary	19 (38.8)	30 (61.2)
College	25 (52.1)	23 (47.9)
Rating of rural experience		
Poor	11 (73.3)	4 (26.7)
Good	36 (36)	64 (64)
No Rural Experience	19 (59.4)	13 (40.6)
Rate CBME Year 4		
Poor	18 (75)	6 (25)
Good	48 (39)	75 (61)

Seventy-four percent of Moi University medical graduates rated the positively perceived the role of CBME in choice of rural practice compared to 46% in Nairobi University medical graduates.

Table 6: Groups' rating of the perceived role of CBME on the choice of rural practice

Variable	Odds Ratio	P-value	95% Confidence Interval	
Moi vs. Nairobi University	7.315	0.000	2.497	21.428
Mother's Education Level				
Primary vs. None	0.347	0.262	0.055	2.204
Secondary vs. None	1.178	0.873	0.157	8.855
College vs. None	0.372	0.389	0.039	3.525
Fathers Education Level				
Primary vs. None	0.049	0.005	0.006	0.407
Secondary vs. None	0.378	0.372	0.045	3.204
College vs. None	0.227	0.193	0.024	2.119
Rate Rural Experience				
Good vs. Poor	3.390	0.087	0.839	13.695
No Rural Experience vs. Poor	0.723	0.707	0.134	3.918
Rate CBME Year 4				
Good vs. Poor	1.865	0.337	0.523	6.649

Summary of Findings on the Perceived Role of Community-Based Medical Education (CBME) in the Choice of Rural Practice by Medical Graduates

It was observed that the factors that were associated with positive perception on the role of CBME in the choice of rural practice were: the medical school where a doctor trained, the doctor's mother's level of education, the doctor's father's level of education, the good rating of early career rural experience and a good rating of the CBME experience in year four.

On controlling for confounders for the five factors, it was observed that the medical school in which a doctor trained was found to have a statistically significant association to a positive perception of the role of CBME with the choice of rural practice. The proportion of Moi University medical graduates who rated the perception positively was 73.5% (95% CI: 60.6, 86.3) while in Nairobi University medical graduates the proportion was 45.9% (95% CI: 35.9, 56.6) [chi-square; p-value=0.002).

Discussion

Perception of Community-Based Medical Education (CBME) by Medical Students and Young Graduates

The positive perception on the role of CBME in career growth by my study participants was higher among medical graduates of Moi University than those of Nairobi University

Students' perception and perspective of CBME has been studied in different CBME delivery contexts. There is evidence of reported perception of better preparedness for clinical roles in British young medical graduates who had CBME as part of their medical curriculum. The positive impact was in comparison with those that did not have CBME in their medical curriculum. The perceived positive impact was by both the medical graduates and those who supervised their internship activities[22].

Australian medical graduates who had CBME as part of their medical training were found to demonstrate more social accountability and better skills to serve disadvantaged and rural communities than those who did not have CBME as part of their medical training[23].

Community-Based Medical Education versus Community-Oriented Medical Education

It was observed that Moi University Medical School offered a community-based education and service (COBES) programme in the form of spiral courses from year one to five that had up to six week rotations within communities. These are communities that the medical graduates are expected to serve. Nairobi University Medical School offered more of a community-oriented education (COE) programme with a singe term in the fourth year of the medical training programme. The courses are provided by the Nairobi University School of Public Health and are mainly didactic, with several one-day visits to rural communities.

In Malaysia, Sahid documented a significant difference in the commitment to rural and

community health care for medical students who had in medical school been offered similar programmes during medical training[24].

In historical cohort comparison of three traditional medical schools in Quebec, Canada, transition from a tradition medical curriculum to one with a community-oriented problem-based learning component was associated with significant improvements in preventive care, continuity of care and improvement in indicators of diagnostic performance of the graduates compared to the ones before the transition. Graduates of medical curricula with CBME demonstrated improved skills and practice on disease prevention and emphasis on continuity of care[25].

The Medical Education Partnership Initiative (MEPI) for selected African medical schools is funded by the government of the United States of America to promote medical education with emphasis on enhancing CBME. This has impacted positively on improved skills and interest among medical graduates to serve in rural and underserved populations[26].

Factors Associated with Young Doctors' Choice of Rural Posting and Setting Up Rural Practices

My study findings were that some of the participants positively identified community-based medical education as one of the factors that influenced their choice of rural posting as new medical school graduates and later in settling for rural practice, employment or both.

The persistent global problem of attracting and retaining doctors to serve in rural underserved populations is well documented. The problem is worse in low and middle income countries (LMICs) where it has been attributed to many factors that include poor working conditions, lack of supervision, under-resourced health systems and low wages. Global and national health policy makers and health managers continue to grapple with possible ways of dealing with this problem[27]. CBME as a major component of the medical training curriculum has been supported as one of the many interventions by health educators and policy makers [28].

Conclusions

The findings of this study concur with similar studies done in other contexts in the findings that community-based medical education has a positive role in the medical graduate's choice of rural practice.

The difference in perceptions on the positive role of community-based medical occupation from Kenyan medical graduates whose only difference was the medical school they trained in and the way the course delivered was noted.

Exposure of rural Kenya to persons in early life, during training and early career posting played an important role in the choice rural practice.

Acknowledgments

The Deans, Moi University School of Medicine and University of Nairobi Medical School in the years 2016/17;
All the participants of this study;
All my colleagues in the Moi University School of Medicine.

Conflict of interest

I declare no conflict of interest.

Funding

The study was self funded.

References

1. Mbemba, G., I., C., Gagnon Marie-Pierre, &Hamelet-Brabant, L. (2016). Factors Influencing Recruitment and Retention of Healthcare Workers in Rural and Remote Areas in Developed and Developing Countries: an Overview. Journal of Public Health in Africa 2016; 7:565doi:10.4081/jphia.2016.565
2. Wilson, N., W., Couper, I., D., De Vries, E., Reid, S., Fish, T., & Marais, B., J. (2009). A critical review of interventions to redress the inequitable distribution of healthcare professionals to rural and remote areas. Rural and Remote Health (Internet) 2009; 9: 1060. Available: http://www.rrh.org.au/articles/subviewnew.asp?ArticleID=1060 (Accessed 29 April 2017).
3. Dussault, G., & Franceschini, M., C. (2006). Not enough there, too many here: understanding geographical imbalances in the distribution of the health workforce. Human Resources and Health 2006; 4: 1.
4. The World Health Report 2003 (WHO. WHR 2003) -shaping the future. Available: http://www.who.int/whr/previous/en/index.html (Accessed 3rd Feb 2017)
5. Wibulpolprasert, S., & Pengpaibon, P. (2003). Integrated strategies to tackle the inequitable distribution of doctors in Thailand: four decades of experience. Hum Resour Health. 2003; 1(1):12.
6. Pagaiya, N., Sriratana, S., Wongwinyou, K., Lapkom, C., &Worarat, W. (2012) Impacts of financial measures on rural retention of doctors. J Health Syst Res.2012; 6(2):228–35.

7. Arora, R., Chamnan, P., Nitiapinyasakul, A. &Lertsukprasert, S. (2017). Retention of Doctors in Rural Health Services in Thailand: Impact of a National Collaborative Approach. Rural and Remote Health17: 4344. (Online) 2017
8. Chen, C., Buch, E., Wassermann, T., Frehywot, S., Mullan, F., Omaswa, F. … & Olapade-Olaopa, E., O. (2012). A Survey of Sub-Saharan African Medical Schools. Hum Resour. Health. 2012; 10:4.
9. Mariam, D., H., Sagay, A., S., Arubaku, W., Bailey, R., J., Baingana, R., K., Burani, A., ------- ----------, & Talib, Z, M. (2014).Community-based education programs in Africa: faculty experience within the Medical Education Partnership Initiative (MEPI) network. Acad Med. 2014 Aug; 89(8 Suppl):S50-4. doi: 10.1097/ ACM.0000000000000330.
10. Walker, J., H., DeWitt, D., E., Pallant, J., F., Cunningham, C., E. (2012). Rural origin plus a rural clinical school placement is a significant predictor of medical students' intentions to practice rurally: a multi-university study. Rural Remote Health.2012; 12:1908
11. Mwanika, A., Okullo,I., Kaye, D., K., Muhwezi, W., Atuyambe, L., Nabirye, R., C., ---------- & Sewankambo, N. (2011). Perception and Valuations of Community-Based Education and Service by Alumni at Makerere University College of Health Sciences. BMC International Health and Human Rights,2011, 11(Suppl 1):S5
12. Ojakaa, D., Olango, S., & Jarvis, J. (2014). Factors affecting motivation and retention of primary health care workers in three disparate regions in Kenya. Human Resources for Health 2014, 12:33
13. Jones, A., McArdle, P., J. & O'Neill, P., A. (2002). Perceptions of How Well Graduates are prepared for the Role of Pre-registration House Officer: a Comparison of Outcomes from a Traditional and an Integrated PBL Curriculum. Medical Education: Jan 2002, Vol 36 (1). Volume 36, Issue 1
14. Reeve, C., Woolley, T., Ross, S., J., Mohammadi, L., ----------, &Neusy, A., J., (2016). The Impact of Socially-Accountable Health Professional Education: a Systematic Review of the Literature. Medical Teacher, 2016.DOI: 10.1080/0142159X.2016.1231914
15. Shahid, H. (2013). Commitment to medical doctors educated with and without community-based medical education towards community healthcare. A study from Malaysia. Education in Medicine Journal. Vol. 5(4). Doi:10.5959/ eimj.v5i4.152. ISSN 2180-1932
16. Tambylyn, R., Abrahamowicz, M., Dauphinee, D., Girard, N., Bartlett, G., Grand'Maison, P., & Brailovsky (2005). Effect of a community oriented problem based learning curriculum on quality of primary care delivered by graduates: historical cohort comparison.BMJ (Clinical Research Ed),[20 Oct 2005, 331(7523):1002]. doi:10.1136/bmj.38636.582546.7c.
17. Talib, Z., M., Baingana, R., K., Sagay, A., S., Schalkwyk, S., C., Mehtsun, S., & Kiguli-Malwadde, E. (2013). Investing in Community-Based Education to Improve the Quality, Quantity, and Retention of Physicians in Three African Countries. Education for Health • Volume 26 • Issue 2.
18. Lehmann, U., Dieleman, M., Martineau, T. (2008). Staffing Remote Areas in Middle- and Low-Income Countries: a Literature Review of Attraction and Retention. BMC Health Services Research 2008, 8:19 doi: 10.1186/1472-6963-8-19.

The World Journal of Medical Education & Research (WJMER) is the online publication of the Doctors Academy Group of Educational Establishments. It aims to promote academia and research amongst all members of the multi-disciplinary healthcare team including doctors, dentists, scientists, and students of these specialties from all parts of the world. The journal intends to encourage 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 interaction will help develop medical knowledge & enhance the possibility of providing optimal clinical care in different settings all over the world.

WJMER

World Journal of Medical Education and Research

An Official Publication of the Education and Research Division of Doctors Academy

9 789380 573694