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Effects of Peer Mentorship on Academic Performance Among Bachelor of Science Nursing Students in Kenyan Universities

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ABSTRACT

Background: Peer mentoring is one of the most effective interventions that have demonstrated ability to ease university transition and promote positive outcomes including better student performance. The study sought to examine the effects of peer mentorship on nursing students' academic performance in Kenya.

Methods: The study was a pretest-posttest quasi-experimental design using quantitative means of data collection. It was conducted in 4 sampled Kenyan universities offering Bachelor of Science in Nursing that included University of East Africa Baraton, Uzima, Great Lakes University of Kisumu and Masinde Muliro University of Science and Technology. 50 third year students were trained and mentored 301 second years in 3 universities .1 university having 85 second year students served as a control group. Data was analysed using Statistical Package for the Social sciences version 28. Descriptive statistics were used to understand student distribution in universities. Paired-samples t-test and independent t test were used to establish relationship within and between groups.

Results: Clinical scores of experimental group compared control group indicated $t=-7.5041$, $P\leq .05$ thus implying that the means of the two groups were significantly different. Results of classroom scores between the experimental and control groups were $t=14.8713$, $P\leq .05$, indicating statistical difference in the means. The pre and post results in clinical and class scores of experimental group indicated significant results with $t=27.72$, $P\leq .05$ and with $t=18.01$, $P\leq .05$ respectively. On the other hand, Pre and post results of clinical control and clinical experimental results indicated insignificant results of $t=-0.60$, $P\geq .05$ and $t=0.96$, $P\geq .05$ respectively.

Conclusion: The study concluded that peer mentorship affects positively student academic performance and recommends use of peer mentorship to support students and inform policy.

Keywords: Peer mentoring, Academic performance, Nursing students, Universities

INTRODUCTION

There has been increasing attention in many countries globally towards student success as it remains a major goal of education.^{1,2} This has led to universities seeking alternative approaches to achieving student success in education.⁽³⁾

Peer mentoring has been identified as one of the most effective elements able to promote positive outcomes especially academic performance.⁴⁻⁶ As a process of nurturing the mentee, peer mentorship was able to impart academic and cultural capital to learners⁷ This eventually led to subsequent better grades

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while meeting the exceptional and cyclical needs of the mentee.^{5,8,9} It also supported personal and academic outcomes regardless of individuals' background and was identified as a key mechanism of social integration and academic success among learners^(6,8,10,11) Similarly, it also created potential to facilitate student transition in university while improving retention and persistence.^{2,8,11-13}

Through the ability to overcome educational stressors and obstacles, peer mentees were able to achieve their desired academic goals.^(14,15) Existence of role model, goal setting and career path were identified as the most beneficial outcomes of peer mentorship that promoted good academic performance.^(16,17) Geng & Midford, and Klassen *et al.*,^(18,19) reported that learners in their early years in academic institutions experienced high levels of stress and that could negatively impact on their performance. Peer mentorship comes in handy in supporting learner ability to integrate knowledge gained in class to the practical placements.^(8,20-22)

In as much as peer mentorship is widely known to affect learner performance in institutions globally, implementation in Kenyan setting has remained low. This is regardless of the fact that student support and transition challenges still exist. The study will provide information that can inform policy as well as form basis for more intervention studies and practices on peer mentorship.

Aim of the study

The aim of the study was to assess the effects of peer mentorship on student academic performance among BScN students in Kenyan universities.

MATERIALS AND METHODS

Design

The study was a pretest-posttest quasi-experimental design that also utilized a control group. There was random assignment of institutions into experimental and control

group thus enabling the researcher to estimate the causal effects of peer mentorship.²³

Study Site 2

Sampled Kenyan universities offering Bachelor of Science in Nursing (BScN). These included University of East Africa Baraton (UEAB), Kisii, Uzima, Great Lakes University of Kisumu (GLUK) Masinde Muliro University of Science and Technology (MMUST).

Study Subjects

Second year nursing students were peer mentees while third years were peer mentors. The entire cohort 301 participants in the 3 universities assigned to experimental were mentored while 85 assigned to control group university and received normal standard support. Total mentors were 50.

Sampling and Sample Size Determination

Through cluster sampling, 1 region (Western) out of 5 regions of Kenya that include Northern, Eastern, Southern, Central and western Kenya was identified. The region comprised of North Rift valley with 2 universities namely Moi and University of East Africa Baraton (UEAB), Nyanza with 4 universities comprising Maseno university, Kisii, Uzima and Great Lakes University of Kisumu (GLUK) and Western 1 university that was Masinde Muliro University of Science and Technology (MMUST). Sample size determination based on the rule of the thumb with 4 out of 7 universities being selected using proportionate allocation and this included UEAB, GLUK, MMUST and Uzima university. Kisii university was used for piloting. Simple random sampling was used to assign institutions into experimental and control group.

Data Collection

Involved reviewing the records of pre intervention and post intervention period for both classroom and clinical performance.

Procedures

Selection of peer mentors

Third years who were interested in peer mentoring were asked to register with the school. Vetting was done to select academically strong students with good social behavior. Mentors needed to demonstrate good understanding of the university

Training of Peer Mentors

Training was done for three days with the mentoring guide based on the study by Minor.²⁴ on building effective mentoring programs. Mentoring competency assessment test was done pre and post training with those attaining 80% and above allowed to mentor. The training aimed at developing competencies in peer mentors that would enable them smoothly conduct peer mentorship.

Mentor Mentee Match

Successful mentors filled forms indicating attributes they wished in their peer mentees and vice versa for peer mentees and the information was used to create the mentoring teams. One to group model of mentoring was used with 1 mentor supporting 6 mentees.

Training of Research Assistants

Research assistants were drawn from faculty and trained on monitoring of activities and data collection.

Intervention

Involved actual mentoring to intervention group and took place for two trimesters thus 8 months from January to August 2020. Mentors worked with mentees on various tasks as identified by both every two weekly or more. Both academic and social challenges were addressed in the mentorship with participants planning and implementing activities on their plans and finally data collection was done.

Data Analysis

Data was analysed using Statistical Package for the Social sciences (SPSS) version 28.

Descriptive statistics were used where means, standard deviations were computed and percentages used to understand student distribution in universities

Paired-samples t-test was used to determine paired samples mean differences between the pre intervention and the post intervention groups hence the effects of peer mentorship on student academic performance. Independent t test was used to determine the difference between the intervention and the control group scores.

FINDINGS AND DISCUSSIONS

Students Distribution Across Universities

The distribution of 386 of nursing students included in the sample for the specified universities was as follows; 106 (27.5%), 99 (25.6%), 96 (24.9%) and 85 (22.0%) for PRB, PRG, PRU and PUM respectively. PRB had a majority of students with PUM having the least. Of the total, 301 belonged to the experimental while 85 belonged to the control group.

Age and Gender 2Distribution of the Students

The mean age was approximately 20 (19.37) years where the youngest student was 18 years old while the eldest was 29 years and with a standard deviation of 1.375. Majority of the students belonged to age approximate of twenty years. Majority of the students, 179 (46.37%) belonged to age 18-20 years while the least was ages above 24years, 68(17.62%). Across all age groups, female students 219(56.74%) were more than male students 167(43.26%) as shown in table 1.

Effects of Peer Mentorship on Student Academic Success

This was based on the hypothesis:-: There is no significant mean difference in the examination scores between the mentored and non-mentored group of students

Relationship Between Experimental and Control Test Results

The current study assessed the effects of peer mentorship on BSc nursing students' academic performance. Independent t-test was conducted to examine the difference between clinical scores of experimental group compared to those of control group. Results indicated $t=-7.5041$, $P \leq .05$ with 384 degrees of freedom thus implying that the means of the two groups were significant at 5% level of significance. Similarly, results of classroom scores between the experimental and control groups were $t=14.8713$, $P \leq .05$, $df=384$ indicating a statistical difference in means of the two groups at 5% level of significance as shown in table 2. The study established a relationship between clinical results and class results when exposed to mentorship and not respectively. The mean of both clinical and classroom results of the mentored groups were higher compared to those of the group that did not receive mentorship. Furthermore, P-values of independent t test $P \leq .05$ for both clinical results and classroom results demonstrated significant difference in the results of the two groups. Collier ⁽⁵⁾ reported higher GPA for learners who had undergone peer mentorship

which is in congruence with the results of the current study. Examining the mean differences in the results of the two groups, it is clear that indeed peer mentorship was able to transform learners into higher scorers which eventually builds their confidence (Table 2).

Relationship Between Pre Intervention Scores and Post Intervention Scores

Paired Samples statistics was done to establish marks scored between the pairs and assess the difference in pre and post test results on both experimental and control groups. The pre and post results in the clinical experimental group indicated significant results with $t=27.72$, $P \leq .05$ and mean difference of 14.81 while clinical control indicated an insignificant results of $t=-0.60$, $P \geq .05$ and $df=84$ with a mean difference of 0.33. There was no significant difference between the pre intervention and post intervention scores of the control group. The pre and post results of the class scores of experimental group likewise revealed a significant relationship with $t=18.01$, $P \leq .05$ at 5% level of significance contrary to control group with $t=0.96$, $P \geq .05$, and mean difference of 0.64. These findings indicate a change in scores of participants who were

Table 1: Students Distribution Across Universities by Age and Gender

Age	University				Total N(%)	Gender	
	PRB N(%)	PRG N(%)	PRU N(%)	PUM N(%)		Male (%)	Female (%)
18-20	50(47.17)	48(48.48)	39(40.63)	42(49.41)	179(46.37)	83(49.70)	96(53.63)
21-23	41(38.68)	34(34.34)	37(38.54)	27(31.76)	139(36.01)	57(34.13)	82(58.99)
Above24	15(14.15)	17(17.17)	20(20.83)	16(18.82)	68(17.62)	27(16.17)	41(60.29)
Total	106(27.5)	99(25.6)	96(24.9)	85(22.0)	386(100)	167(43.26)	219(56.74)

Table 2: Relationship Between Peer Mentored and Non-Mentored Students' Performance Scores in Clinical and Classroom Examination

Pair	Category		Mean	Df.	Std. error mean	T	Sig.
Pair 2	Clinical control and clinical experimental	Post test	-13.265	384	0.0892	14.870	.0001
Pair 4	Class control and class experimental	Post test	-7.164	384	0.953	7.519	.0001

Sig. value of $\leq .05$ indicate a significant association between the groups under each pair at 5% level of significance

Table 3. Relationship Between Pre Intervention Scores and Post Intervention Scores in Both Clinical and Classroom Examination

Pair	TYPE	GROUP	Mean	Mean diff	SD	Df	STD error	T	P
Pair 1	Pre test	Clinical experimental results	65.0498	14.81	4.2912	300	0.2473	27.72	.00001
	Post test	Clinical experimental results	79.8605		8.0495		0.464		
Pair 2	Pre test	Class experimental results	65.1063	9.25	3.0879	300	0.178	18.01	.00001
	Post test	Class experimental results	74.3522		8.4425		0.4866		
Pair 3	Pre test	Clinical control results	66.2471	0.33	3.3803	84	0.3666	0.60	.2735
	Post test	Clinical control results	66.5765		3.2196		0.3492		
Pair 4	Pre test	Class control results	66.5529	0.64	3.4244	84	0.3714	0.96	.1709
	Post test	Class control results	67.1882		4.6483		0.5042		

Sig. value of $\leq .05$ indicate a significant association between the groups under each pair at 5% level of significance

mentored unlike in the non-mentored where the relationship could not be elicited as shown in table 3. The F statistics value was $F = 217.6815$ and a P-value < 0 following an analysis of variance. Comparing the results of the pre intervention and the post intervention period, the study clearly demonstrates that the peer mentored group demonstrated huge difference between the pre intervention and the post intervention scores. This demonstrates that when students are mentored, their academic performance simultaneously improves. The findings resonate with those of Asgari & Carter⁽⁶⁾ who reported consistent improvement in the learners that underwent peer mentorship. Similar findings were reported by Mashehela & Mabika⁽⁷⁾ who identified a positive impact of peer mentoring to academic capital among the mentored students.

Class control results pre and posttest indicated insignificant relationship demonstrating the implication of not mentoring students in institutions of higher learning. In as much as they may achieve scores to progress in academics, their potential in achieving higher scores was limited. Similarly, this could compro-

mise skill acquisition and performance that has a ripple effect in patient care. In as much as Bonin²⁰ could not establish any correlation between peer mentoring and student academic success, findings of this study and those of Gamezet *al* and Du Prez^(2,15) established that majority of mentees were able to overcome academic stressors leading to improved performance in examination (Table 3).

CONCLUSION

The study concluded that peer mentorship has positive effects on student academic performance thereby rejecting the null that stated, : There is no significant mean difference in the examination scores between the mentored and non-mentored group of students

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

SOURCE OF FUNDING

The authors received no financial support.

ETHICAL CLEARANCE

Ethical clearance was obtained from MMUST Institutional Ethics Research Committee (IERC) number MMUST/IERC/107/20 and permit obtained from National Commission of Science, Technology and Innovation (NACOSTI) Licence number NACOSTI/P/20/3430. Permission was sought from institutions and oral consent from participants. Any benefits or risks were discussed and participants informed that information was for research purposes only. Random sampling and random assignment into experimental and control group for institutions was done to achieve justice.

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Experiences of Bachelor of Science Nursing Students Participating in Peer Mentorship in Kenyan Universities

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ABSTRACT

Peer mentoring provides opportunity of a higher skilled or experienced individual to support the lesser in the same category with benefits being experienced by both. Peer mentors eventually perceive the process as transformational born out of desire to help. Due to the nature of the course intensiveness of nursing, the nursing student mentoring experiences demonstrate a mutually beneficial relationship. The study aimed at exploring Experiences of Bachelor of Science Nursing Students Participating in Peer Mentorship in Kenyan Universities. The study was qualitative conducted in three universities that had participated in a peer mentorship program between January to August 2020 involving 50 peer mentors. Data collection involved individual interviews and focused group discussions. Data was analyzed thematically. Findings revealed 3 themes that emerged describing change that occurred in the peer mentor and these were: Development of social interaction abilities, Development of stress management skills and Development of resiliency. Peer mentors felt that the experiences helped produce a lot of change in them in as much as the intension was to support peer mentees. The study concludes that peer mentorship is beneficial in promoting both individual mentor as well as institutional educational and social goals. The study recommends utilization of peer mentorship in institutions of higher learning since it benefits both the mentor and mentee.

Key words: Peer Mentor, Nursing Students, Experiences, Universities, Mentoring

INTRODUCTION

Academic success has a great influence on a student's self-esteem, motivation, and perseverance in higher education hence the need for mentoring.¹⁻² Defining mentorship puts both the mentor and the mentee at the core³ with the partnership described as of mutual growth with one having advanced knowledge, skills and experience than the other and in the process both achieve their goals.⁴⁻⁵

Peer mentoring is a model of mentorship where participants fall in one category of classification with one being slightly higher in terms of knowledge, skill or experience and therefore mentors apply newly acquired skill and knowledge in supporting the younger peers.⁶ It has high impact practices necessary for achieving essential higher education learning outcomes.⁷⁻⁸ Yomtov *et al*, and Gunn *et al*,⁹⁻¹⁰ explained the benefits of peer mentorship as the mentor and mentee

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operate together defining possible solutions to problems and testing ideas that confront their daily lives. These makes them voice feelings of having been helped to achieve academic excellence thus a rewarding exercise and win-win engagement.¹¹Peer mentors perceived their role as key in developing sense of belongingness,¹² and were enthusiastic as it enhanced their self-regulatory abilities easing university transition⁽¹³⁾ thus a transformative process born out of desire to help.

In as much as literature reveals benefits of peer mentorship and positive experiences, there is limited evidence on experiences of peer mentors in Kenyan universities and more so schools of nursing. The study sought to examine experiences of peer mentors following a peer mentoring program in Kenyan universities

MATERIALS AND METHODS

Study Design and Site

A qualitative study was conducted in Universities where peer mentorship had taken place in Kenya during January to August 2020. This included Masinde Muliro University of Science and Technology (MMUST), University of East Africa, Baraton (UEAB) and Great Lakes University of Kisumu.

Participants

Included third year nursing students who had been trained and participated in the peer mentoring program for the period January to August 2020 totaling to 50 participants.

Sampling

Purposive sampling of all trained peer mentors.

Data collection

Data was collected between August to September 2020 on 50 participants. In-depth interviews that lasted between 45 to 90 minutes were conducted each

individual respondents. For focused group discussions (FGD), the interview lasted between 90 to 120 minutes. A total of 6 participants, 2 from each university participated in individual interviews while the remaining joined the FGD with six FGDs being conducted, 2 from each university comprising between 10 to 15 participants. Data was audio recorded, transcribed and summarized into themes on how mentors perceived their experience of mentoring. Interview guide developed by researcher was used and participants reflected on their period before mentoring and after do define their experiences.

Data analysis

Data was analyzed using themes⁽¹⁷⁾ as audio recorded data was listened to severally and transcribed with repeated patterns being identified thus guiding its organization.⁽¹⁸⁾ Fragmentation and classification of data was done followed by networking to allow in-depth understanding of the experiences. Triangulation was done to ensure validity and reliability where by 3 individuals were given the audio recorded information to independently analyze and findings validated to form one document. Respondents also validated the information where by three of them were given the report to go through and confirmed the results to be a true perspective representation of their discussion.¹⁹

FINDINGS

Demographic Characteristics of Respondents

Out of the 50 participants, 31(62%) were female while 19 (38%) were male. 9(18%) belonged to age 18-20, 36(72%) to 20-23 years while 5(10%) belonged to 24 and above years. The mean age was 22.48 years with a standard deviation of 1.7524 age range was 18-26 years. Majority of the participants 39 (78%) had never mentored any one before while 7(14%) had been mentored while in high school.

Description of Themes

Three major themes emerged from the experiences of peer mentors and these were, development of social interaction abilities, development of stress management skills and finally development of resiliency.

Development of Social Interactions

To generate these theme, participants' discussions revolved around their experiences in terms being able to connect and interact with others with ease as well as discussing plans and projects with others. This included their ability to work on tasks with mentees while participating in making contributions to tasks while assuming different roles. Their ability to expand the network of friends also provided insight into the social relations development. Some of the responses were as follows...

"The experience was one of its kind...I was encouraged by my friends to take it up... I found myself shy before my mentees... I skipped my first session due to fear...I then picked up slowly by slowly." (PM5e)

Pauses the continues....

"After I was helped to overcome fear, I met my mentees... I can assure you that we actually enjoyed quality relationship. We met severally and discussed wide range of issues, classroom, clinical and social... you can imagine them looking at me as a role model" (PM5e)

The statement above affirms that the role of faculty supervision for success of peer mentorship. The study was able to identify the point at which peer mentors now started developing their social interaction skills as revealed in the sentiments when they said...

"During the process... my communication abilities tremendously improved as I planned both individual and group meetings... I knew when to lead and when to allow others to take the lead. We all developed understanding and respect...I was a golden opportunity." (PM5b)

"I have become friends with my mentees... I equate being a mentor to being a mother..."

you love unconditionally...I can tolerate different personalities... socializing has been an aspect of growth for me, making me build trust and confidence." (PM2f)

Development of interaction skills was one of the key successes as experienced by mentors as they said...

"My first encounter with peer mentees motivated me..... They embraced the program with gratitude inspiring me to open up and support them the more." (PM8c)

"The program has helped me improve interaction with friends, patients and even polish my study skills." (PM 3a)

"I am changed...I share strengths and weaknesses with mentees and other mentors... my communication is now supper." (PM 4d)

Respondents developed positive social interaction through stages. Most felt that the change was progressive that they did not even realize the moment they became responsible. There was common agreement that they had increased their network of positive relations that enabled smooth transition in university. Discussing issues, assignments and plans while making significant contributions was a feature exhibited in all discussions. Some respondents said...

"Mentoring experience was a growth process for me... changing me from a dependent person to a dependable person." (PM7 c)

"I was that quiet person in groups... now imagine it was me... leading others... and not just one...but many." (PM5a)

"Personally I was not that good at making friend... now I have to help others make friends ...and good friends." (PM9a)

Development of Stress Management Skills

To generate these theme, mentors talked of changes experienced in handling stress among self and mentees, relaxation approaches, decision making as well as handling dilemmas.

Thoughts about consequences of behavior were also explored and these can be seen from statements from participants as follows...

"I was so closed up and could not share my issues with anyone...until I stated mentoring and discovered some of my mentees were open with situations they were going through and sincere in their search for help...this made me soul search myself." (PM3b)

She continues

"I asked myself, how come I was listening to other and offering help yet confined to myself... I made a decision to open up.... I credit lessons learned though peer mentoring. I approach issues with open mind." (PM3b)

"I am now free... I do activities with less stress... This has generated positive attitude towards nursing...my self-esteem has been boosted, confidence high and things good." (PM9b)

Most respondents felt that as much as they were expected to help, a lot of change was happening to them. Helping others handle stressors provided avenue for maturation in stress management and so they said...

"We had to read, google and sometimes rehearsed how to handle stressors ... Imagine telling someone to relax when you can't do it yourself... We had to evolve." (PM 4c)

"Nowadays you don't just jump to decisions, you weigh every option...I can tell you ... This is a skill I have developed." (PM6d)

"Helping others has made me a very keen person... I think about consequences ... even when everybody is for a particular position. I still must weigh options." (PM8f)

Development of Resilience

In understanding this theme, responses on how mentors worked on their goals with required energy without giving up and their abilities to bounce back after hard times were examined. Helping mentees ward through hard times developed similar abilities in mentors who expressed how perceived

difficult circumstances became easy to navigate by saying...

"It has been a learning experience working with mentees...Things became easier as we kept interacting... We understood and embraced each other's differences. I learned to mature up to the occasion." (PM3a)

"Initially, things were tough and frightening... (laughs). Not any more... I thought working with mentees will affect my schedules, demand time Contrary to these... The experience has been favorable and Interesting.... When things are tough...I wade through Because my mentees are watching. I can't disappoint." (PM9b)

"As a mentor...I have to tread very carefully... Mentees look up to me both in school and clinical area...I work hard to better my grades and competencies...I didn't want an instance when mentee asks me questions and I am dumbfounded...I have learned patience since I interact with different personalities." (PM2c)

"Peer mentorship is not easy and can be overwhelming sometimes. There should be a mechanism of supporting mentors... otherwise it was such a learning." (PM7c)

DISCUSSION

The findings reveal that in as much as mentors may be enthusiastic on carrying out their roles, the initial support is quite important. Narayan and Sharma⁽⁴⁾ reported personal satisfaction with experiences following the enriching relationship, a finding similar with this study where participants found it easy working with others who were both mentees⁽¹²⁾ and fellow peer mentors. The study also revealed mentors taking up leadership roles in groups, valuing their individual and group contributions and not shying away from fronting their views concerning subjects under discussion. By the end of the process, majority reported having expanded their network of friend and collabora-

tors among classmates, college mates and even having it ease to interact with faculty in the university and clinical areas.

Peer mentors reported how they handled stressful issues among peer mentees and in the process developing abilities to manage their own issues⁽¹⁰⁾. There was development of open-mindedness emanating from observing the sincerity that was portrayed by some of the peer mentees in search of help when confronted with challenges⁽¹²⁾. Maturity was exhibited as participants told tales of how they handled conflicting issues, made decisions when confronted with dilemmas since the awareness of their responses to issues and consequences of subsequent behavior was clear. As roles models, making right decisions was paramount as expressed by respondents who reported to have increased their self-esteem and confidence following mentoring.

Peer mentors reported how their focus on goals was enhanced⁽⁶⁾ as they were able to dedicate their energies to achieving them⁽¹²⁾ concurring with Bagakaet *al's* findings on the concept of socialization that made mentoring program more effective.⁽²⁰⁾ They would easily take up hard tasks since they now believed in their abilities as they developed through helping others thus appreciating the benefits of mentorship.⁽¹⁰⁾

CONCLUSION

Peer mentorship is a beneficial activity in universities since besides benefits to the mentees and institution, it provides mentors with increased positive social relations, development of stress management skills as well as abilities to exhibits resilience while transitioning through educational institution.

CONFLICT OF INTEREST

There is no conflict of interest to be disclosed.

SOURCE OF FUNDING

There was no financial support for this research.

ETHICAL CLEARANCE

This was sought from MMUST Institutional Ethics Research Committee(IERC) number MMUST/IERC/107/20 and Permit from National Commission of Science, Technology and Innovation (NACOSTI) license number NACOSTI/P/20/3230. Institutions where data was collected gave permission and respondents orally consented.

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The Effect of Neuropathic Exercise on HbA1c Value in Patients with Type 2 Diabetes Mellitus

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ABSTRACT

Introduction: Complications of diabetic peripheral neuropathy (DPN) are one of the complications of type 2 diabetes mellitus. DPN often occurs in people with diabetes mellitus, where one out of every five people with diabetes mellitus is at risk of it. DPN occurs in more than 50% of people with type 2 diabetes and is a significant risk factor for skin breakdown, amputations, and reduced physical mobility. This study aims to see the effect of neuropathic exercise interventions on decreasing HbA1C values in patients with type 2 diabetes mellitus.

Methods: This research is quantitative research with a Pre-Experimental Design with a Pretest-Posttest Group Design approach aiming to see the effect of neuropathic exercise on the decrease in HbA1C values in patients with type 2 diabetes mellitus. The intervention carried out in patients with type 2 diabetes mellitus is neuropathic exercise. *On the pre-test*, Patients with type 2 diabetes mellitus were assessed for neuropathy symptoms using 10-gram monofilament and measuring the HbA1C value and then given the intervention of neuropathic exercise, which is carried out every day for 15 minutes for six weeks. *On the post-test*, an assessment of changes in HbA1C values for people with type 2 diabetes mellitus was carried out.

Results: The results showed an effect of neuropathic exercise on a decrease in HbA1C values. Before the intervention of neuropathic exercise, the HbA1C value with a Mean \pm SD of 10.42 ± 12.877 ; after the intervention of the neuropathic exercise, the HbA1C value became 9.88 ± 2.904 with a *p* value: 0.001 .

Conclusion: Neuropathic exercise can be done in people with diabetes mellitus to decrease HbA1c values and prevent DPN.

Keywords: *Neuropathic Exercise, HbAc1 Value.*

INTRODUCTION

Complications in patients with type 2 diabetes mellitus are on the feet. These complications can cause physical, physiological, and financial problems to them. Complications of diabetic peripheral neuropathy (DPN) are one of the complications of type 2 diabetes mellitus. The prevalence is 13% to 68% in the population with diabetes mellitus¹

Study group: Their mean age (49.40 ± 3.35). Neuropathy is a complication that often occurs in people with diabetes mellitus, in which one out of every five people with diabetes mellitus (20%) is at risk of experiencing DPN. Complications of DPN are related to the blood supply to the feet, which occurs due to diabetes mellitus². Patients with type 2 diabetes mellitus complications, in general, have DPN and have the potential to experience

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foot ulceration and infection that can result in amputation of the lower extremities³.

DPN is heterogeneous, with various clinical manifestations in each patient with diabetes mellitus. DPN occurs in about 75% of people with diabetes mellitus. DPN is defined as a dysfunction of the peripheral nerves affecting the large and small afferent nerves. Usually, people with diabetes mellitus who experience DPN will feel burning pain, feel like they are being stabbed, paresthesia, hyperesthesia, and sometimes may experience numbness⁴. It is a condition with a loss of sensory function in the distal areas of the lower extremities, occurring in 50% of people with diabetes mellitus⁵.

Exercise and training can improve neuromuscular strength and treat DPN, such as nerve conduction velocity, pain, and balance⁶. It is one of the most common complications in people with diabetes mellitus (DM). Manual exercise and exercise are very beneficial for people with diabetes mellitus with DPN⁷.

The most common complication in type 2 diabetes mellitus is DPN. Training or physical exercise is a way to prevent and treat DPN in patients with type 2 diabetes mellitus. Training or physical exercise has a positive effect on improving foot sensation in patients related⁸. Diabetic peripheral neuropathy (DPN) occurs in more than 50% of people with type 2 diabetes and is a significant risk factor for skin breakdown, amputations, and reduced physical mobility. Regular exercise and exercise are very beneficial for people with diabetes in overcoming DPN⁹.

METHOD

This research was quantitative research where the research design was a Pre-Experimental Design with a Pretest-Posttest Group Design approach aiming to see the effect of neuropathic exercise on decreasing HbA1C values and increasing value by adding 10 Gram Monofilament in patients with type 2 diabetes mellitus. The intervention carried

out in patients with type 2 diabetes mellitus is neuropathic exercise. *On the pre-test, the HbA1C values of the Type 2 diabetes mellitus patients were measured and then given the intervention of neuropathic exercise, which was carried out every day for 15 minutes within six weeks. On post-test, the changes in HbA1C values of people with type 2 diabetes mellitus were assessed.* The sample in this study were DM patients treated at the Curup Regional General Hospital Polyclinic, Rejang Lebong Regency, Bengkulu Province, Indonesia. The sampling technique used in this study was *probability sampling or randomized sampling*. The sample size was at least 35 respondents. Instruments In this study, the intervention carried out was a neuropathic exercise. Patients with type 2 diabetes mellitus did daily neuropathic exercises for 15 minutes within six weeks. Then the HbA1C value was measured. **Data Analysis** make use of IBM SPSS Version 23 was utilized to analyze the data. The data analysis included respondent characteristics, data normality tests, and mean differences HbA1c values before and after neuropathic exercise in patients with Type 2 diabetes mellitus.

RESULT

The study was conducted on 35 types 2 diabetes mellitus patients who received therapy at the Curup General Hospital Polyclinic, Rejang Lebong Regency, Bengkulu Province, Indonesia. The characteristics of the respondents can be seen in the following table:

Table 5.1 shows the characteristics of the respondents. The age characteristics indicate that most of the participants aged more than 57 years were 18 (57.1%). Most of the gender was male, with 20 (56.7%) respondents. Meanwhile, in the educational background, respondents from middle to high school were 26(74.3%). Regarding job characteristics, most respondents had a history of not working 26(74.3%). In the duration of suffering from diabetes mellitus, some respondents had had the therapy for

more than five years, amounting to 19(63.3%). In contrast, the treatment carried out by most of the respondents, 28(80%), was insulin.

Table 1. Characteristics of Respondents

Characteristics of Respondents	n	%
Age (years):		
≤ 57	17	48,6
> 57 and above	18	51,4
Average (SD)	9.027	
Gender:		
Man	20	57,1
Woman	15	42,9
Education:		
Middle and High School	26	74,3
University	9	25,7
Work:		
Work	9	25,7
Not working	26	74,3
Diabetes Mellitus Duration		
≤ 5 Years	7	20
> 5 Years	28	80
Treatment Used		
Insulin	7	20
Oral medication	28	80

2. Data normality test results on the effect of neuropathic exercise on HbA1c values in patients with type 2 diabetes mellitus.

Before determining the statistical test, a data normality test was first carried out to see the normality distribution of the data on the effect of neuropathic exercise on HbA1c values in patients with type 2 diabetes mellitus at Rejang Lebong District Hospital, Bengkulu Province, Indonesia. The distribution can be seen in the following table:

Table 2 shows the results of the data normality test using the Shapiro-Wilk statistical test. The normality test results indicated that the p-value was mainly less than 0.05. These results concluded that the data were not normally distributed, so using Wilcoxon as non-parametric statistics was the appropriate statistical test to run.

3. Average difference of HbA1c values before and after neuropathic exercise in patients with type 2 diabetes mellitus.

The statistical test non-parametric Wilcoxon examined the average of HbA1c values before and after neuropathic exercise as the result of the abnormality of the data distribution.

Table 2. Data normality test results on the effect of neuropathic exercise on HbA1c values and addition 10-gram monofilament test scores in patients with type 2 diabetes mellitus.

No	Data	Mean	SD	p-value	95%CI
1.	Age	57,21	4,525	0,000	55,63-58,78
2.	Gender	1,44	0,504	0,000	1,27-162
3	Education	1,26	0,448	0,000	1,11-1,42
4	Work	1,26	0,448	0,000	1,11-1,42
5	Lama Diabetes Mellitus	7,00	1,518	0,000	6,47-7,53
6	HbA1c value Before Neuropathic Exercise	10,42	12,877	0,000	8,86-10,89
7	HbA1c value After Neuropathic Exercise	9,88	2,904	2,904	5,93-14,91

Table 3 Average difference of HbA1c value before and after neuropathic exercise in patients with type 2 diabetes mellitus.

Measurement	Mean	SD	WITH	p	Minimum-Maximum
HbA1c score					
- Before	10,42	12,877	-4,422	0,000	8,86-10,89
- Neuropathy Exercise	9,88	2,904			5,93-6,96
- After Neuropathy Exercise					

Table 3 shows the statistical test results on the difference in the average HbA1c values before and after neuropathic exercise in patients with DM undergoing therapy at the internal medicine polyclinic at Curup Hospital. As shown in Table 3, the z-value was -4.422, and the p-value was <0.05. These results interpret the significant difference in the average HbA1c value before and after neuropathic exercise in patients with type 2 diabetes mellitus.

DISCUSSION

Effect of Neuropathic Exercise on HbA1c Value

Long-term variations in glycemic values and HbA1c values are a sign of macrovascular and microvascular complications of diabetes mellitus. The average HbA1c value influences the occurrence of complications of DPN¹⁰. Variations in HbA1c values are associated with cardiovascular and microvascular disease risk in patients with type 2 diabetes mellitus¹¹. Aerobic exercise that is carried out routinely using short exercises can be an intervention to improve peripheral nerve function in patients with type 2 diabetes mellitus¹². Aerobic exercise can reduce pain in people with DM who experience complications of DPN¹³. The HbA1c value is a biomarker in diagnosing DM and is associated with DPN complications¹⁴ lower-extremity amputation and mortality. Patients with diabetes mellitus have a predisposition toward developing chronic inflammatory demyelinating polyneuropathy, and this may also facilitate the formation of diabetic foot and cutaneous impairment, which are considered one of the most serious impairments of diabetes mellitus, with a prevalence of 4–10% in this population. Biomarkers research provides opportunities for the early diagnosis of these complications for specific treatments useful to prevent amputation and, therefore, physical inability and mental disturbance. The recent literature has suggested that glycemic levels may be a novel factor in the pathogenesis of diabetic

foot complications and is an important mediator of axonal dysfunction. The aim of this systematic literary review is to determine whether hemoglobin A1c (HbA1c). There is an effect of the decrease in HbA1c value and decreased pulse after exercise in patients with type 2 diabetes mellitus¹⁵. Exercising for more than 150 minutes per week can lower the HbA1c values. Activities carried out at high intensity can reduce the value of HbA1c when compared to activities with low intensity in patients with type 2 diabetes mellitus. Physical activity can help people with diabetes improve cardiorespiratory fitness, increase strength, improve glycemic control, reduce insulin resistance, improve lipid profiles, reduce blood pressure and maintain weight loss¹⁶.

Long-term exercise and training programs have been shown to help people with type 2 diabetes mellitus control blood sugar and significantly affect HbA1C and Basal Metabolic Rate (BMR)¹⁷. Exercise and training influence the decrease of HbA1C, Basal Metabolic Rate (BMR), and fasting blood sugar¹⁸ body mass index (BMI). Regular exercise can improve blood sugar control, decrease HbA1C, reduce insulin resistance and increase muscle strength in patients with type 2 diabetes mellitus. Exercise also increases muscle mass and bone density, affecting the functional improvement of the extremities and preventing osteoporosis¹⁹. Structured exercise and training, such as aerobics for more than 150 minutes per week, can reduce HbA1C in type 2 diabetes patients and should be combined with a diet program²⁰. Exercise is beneficial for reducing DPN complications. An appropriate exercise program can be an alternative treatment for DM patients who suffer from DPN²¹. Some possible limitations that may negatively impact the validity of the generalization of the research results are that respondents were from one hospital only in Indonesia. Even though the validity and reliability have been tested rigorously, verifying the validity and reliability in other studies with various hospitals is recommended.

CONCLUSION

This study shows that there is an effect of neuropathic exercise on decreasing HbA1c values and an effect of neuropathic exercise on increasing the value of Monofilament 10 Gr. Neuropathic exercise can be recommended to patients with diabetes mellitus to decrease HbA1c values and prevent DPN.

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Conflicts of interest

The authors declare that they have no conflict of interest

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Ethical Considerations

This research was carried out by considering ethical principles during the research process. This research passed the ethical test and obtained the Ethical Permit Number No.KEPK/425/10/2022 by the Research Ethics Commission of the Health Engineering Polytechnic of the Bengkulu Ministry of Health. Participants who met the requirements in this study explained the research implementation process and stated that they were willing to become research participants in a written statement. Participants filled in the informant consent that participants understood the information that had been provided. Participants had the right to withdraw from the research without coercion.

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Assessing PICU Staff Nurses' Knowledge toward Delirium in Pediatric Patients

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ABSTRACT

Background: Delirium is frequently under diagnosed and under treated in Pediatric Intensive Care Units (PICU). Both adult and pediatric literature have noted the significance of detecting and treating PICU delirium. Delirium lengthens hospital stays, the duration of mechanical ventilation, and the Intensive Care Unit (ICU) and PICU morbidity.

Method: The goal of this study was to use a brief questionnaire to assess pediatric critical care nurses' current understanding of delirium and its risk factors. Assuming that PICU nurses lack the necessary information to accurately screen for and diagnose delirium in critically ill children before a focused nursing educational intervention. To gauge current understanding regarding delirium in children, a 10-bed PICU distributed a 16-question online survey to all PICU nurses.

Results: The response rate was 84% (26/31). Lack of knowledge was found that only two staff nurses (2/26; 8%) who properly responded when asked whether administering benzodiazepines is beneficial in treating delirium when asked about the use of these drugs to treat the condition. In addition, a family history of dementia predisposes a patient to delirium was another question that some participants correctly answered (4/26; 15%). Lastly, common incorrect answers when using the Glascoma Scale (GCS) as a diagnostic tool to identify delirium in pediatric patients, some staff nurses frequently give the incorrect response that delirium always manifests as a hyperactive, confused state, and those pediatric patients typically do not remember being delirious (5/26; 19%).

Conclusion: The survey's findings revealed knowledge gaps about the causes, symptoms, and treatments of pediatric delirium in critically ill children. Before the unit-wide adoption of a delirium screening and prevention program, PICU staff members urgently need to receive nursing education concerning pediatric delirium and associated risk factors, particularly regarding screening procedures and pharmacologic risk factors.

Keywords: Delirium, Pediatric Patients, PICU Staff, Nursing Education

BACKGROUND:

Delirium is a state of organic brain malfunction brought on by acute somatic illness, intoxication or drug withdrawal, exposure to toxins, or a variety of other causes. It has an abrupt and fluctuating onset and is defined by a general decline in cognitive abilities,

a reduction in consciousness, attention difficulties, changes in psychomotoractivity, and sleep-wake cycle disorder¹. In an Intensive Care Unit (ICU), delirium mostly affects up to 80% of patients with long-term cognitive impairment². Delirium in pediatric intensive care setting has been currently known in the

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literature, in prospective longitudinal cohort study found that fifty-six children (27%) acquired delirium during their staying in the Pediatric Intensive Care Unit PICU and found that there is an independent association between decreased the quality of life after hospital discharge and delirium in the PICU setting⁽³⁾.

Delirium in pediatric setting increases the risk of prolonged time of mechanically ventilated patients, length of stay, mortality rate, and healthcare care service cost mortality^(4,5,6,7,8,9,10,11). Delirium screening has significantly risen in academic pediatric ICUs during the past three years. According to Valdivia and Carlin⁽¹²⁾. Frontline PICU nurses can undertake screening using the Cornell Assessment of Pediatric Delirium (CAPD) at the patient's bedside quickly and accurately. Another illustration comes from Dervan et al. who demonstrated a 92.3% score completion rate out of 13844 total eligible scoring chances over the course of a 31-month retrospective study⁽¹³⁾. With several research proving viability and reliability^(14,15,16,17,18), the time has arrived for delirium screening in all critically ill children to be widely implemented.

To facilitate a reliable and consistent delirium screening tool in the healthcare setting under the umbrella of the ministry of health organization, it is important to determine staff nurses' insight and current knowledge; and prevention of delirium among PICU patients. The research goal is to assess staff nurses' knowledge to highlight the importance of utilizing a valid delirium screening assessment tool in a healthcare setting. Before conducting a focused educational intervention, the researcher anticipated that PICU nursing staff lacked

sufficient knowledge to accurately screen for and diagnose delirium among critically ill children in PICU setting.

METHODOLOGY

The hospital is under the umbrella of the ministry of health (MOH), where the research is working. All nurses in a 10-bed PICU were given a 16-item survey to gauge their level of familiarity with pediatric delirium. Survey approval was obtained from the author to distribute during the study. Based on the data that is currently available regarding risk factors, screening procedures, therapies, and diagnostic standards for adult and pediatric delirium, survey questions were developed by specialists in the pediatric delirium⁽¹⁹⁾.

The participation of individual responses would remain anonymous and confidential. Their voluntary participation is considered as consent to participate in this study. Approval from the institutional review board of the Ministry of Health Organization of Jeddah was obtained IBM SPSS Statistics software (version 23) was used to analyze the data. The percentage of respondents who answered each question correctly served as a summary of the data.

RESULTS

The survey was conducted on all PICU staff nurses and twenty-six (84%) out of thirty-one (31) nurses completed the survey. PICU staff qualifications who pursued bachelor were 57% and 42% were Diplomas. 53% of PICU staff nurses' age range was from thirty to forty-nine years and 57% have years of experience of more than 10 years. The percentile of nurses who correctly answered the questions ranges from (8%-96%) as it is shown in Table 1.

Table 1 Survey answers

Survey item	Correct	Incorrect
1. Fluctuation between orientation and disorientation is not typical of delirium (FALSE)	17 (65%)	9 (34%)
2. Poor nutrition increases the risk of delirium (TRUE)	23 (88%)	3 (12%)

Survey item		
3. The GCS score is the best way to diagnose delirium in critically ill children (FALSE)	5 (19%)	21 (81%)
4. Hearing or vision impairment increases the risk of delirium (TRUE)	21 (81%)	5 (19%)
5. Delirium in children always manifests as a hyperactive, confused state (FALSE)	5 (19%)	21 (81%)
6. Benzodiazepines can be helpful in the treatment of delirium (FALSE)	2 (8%)	24 (92%)
7. Behavioral changes in the course of the day are typical of delirium (TRUE)	24 (92%)	2 (8%)
8. Patients with delirium will often experience perceptual disturbances (TRUE)	25 (96%)	1 (4%)
9. Altered sleep/wake cycle may be a symptom of delirium (TRUE)	21 (81%)	5 (19%)
10. Symptoms of depression may mimic delirium (TRUE)	21 (81%)	5 (19%)
11. The greater the number of medications a patient is taking, the greater their risk of delirium (TRUE)	14 (54%)	12 (46%)
12. A urinary catheter in situ reduces the risk of delirium (FALSE)	22 (85%)	4 (15%)
13. Gender has no effect on the development of delirium (FALSE)	11 (42%)	15 (58%)
14. Dehydration can be a risk factor for delirium (TRUE)	20 (77%)	6 (23%)
15. Children generally do not remember being delirious (FALSE)	5 (19%)	21 (81%)
16. A family history of dementia predisposes a patient to delirium (FALSE)	4 (15%)	22 (85%)
Flaigle, M. C., Ascenzi, J., & Kudchadkar, S. R. (2016). Identifying barriers to delirium screening and prevention in the pediatric ICU: evaluation of PICU staff knowledge. <i>Journal of pediatric nursing</i> , 31(1), 81-84(19).		

Gaps in knowledge of PICU staff nurses were identified in some specific survey concepts. Pediatric patients who are not on a urinary catheter are less likely to have delirium (22/26; 85%). Common lack of knowledge to PICU staff nurses about hearing or vision impairment increases the risk of delirium, altered sleep/wake cycle could be a symptom of delirium, and symptoms of depression may mimic delirium (21/26; 81%). Some nursing staff (20/26; 77%) believed that dehydration can be a risk factor to have delirium. Responses incorrectly answered in fluctuation between orientation and disorientation do not consider

delirium (17/26; 65%). Also, almost half of the staff nurses incorrectly answered that the more medication the patient received the more likely the patient will acquire delirium (14/26; 54%).

Extreme deficiency in knowledge was noticed in different items of this survey including, participants who believed that gender differences have no effect on the development of delirium among pediatric patients (11/26; 42%). Also, some staff nurses have the common incorrect answer in believing that using the Glasgow Scale (GCS) as an assessment tool to diagnose delirium among

pediatric patients, delirium always manifests as a hyperactive; confused state; and pediatric patients generally do not remember being delirious (5/26; 19%). Furthermore, some participants correctly answered in a family history of dementia predisposes a patient to delirium (4/26; 15%). When staff nurses were questioned about benzodiazepines as a treatment for delirium, two staff nurses (2/26; 8%) correctly answered in the administration of benzodiazepines not helpful in the treatment of delirium.

DISCUSSION

The survey's findings highlight specific knowledge gaps among PICU nursing staff about the causes, symptoms, and treatments of delirium among pediatric patients. A greater risk of later delirium was linked to intermittent urine catheterization and foley implantation. Only foley placement in the critical setting remained substantially linked with the development of in-hospital delirium after controlling for the presence of dementia⁽³⁾, however, eighty-five percent of staff nurses responded incorrectly that inserting a foley catheter into a patient can reduce the risk of delirium. In adult and pediatric patients who have a vision or hearing impairments are more likely to have delirium in the healthcare setting contradicting eighty-one percent of responses answered that patients who have hearing and vision impairments are less likely to have delirium^(20,1). Also, eighty-one of the nurses' respondents believed disturbing the sleep cycle of the patient will not be considered a delirium symptom, but studies show that sleep cycle alteration in the pediatric patient can cause delirium^(4,21,22,23). Although 34% of staff nurses responded that delirium is not typically characterized by fluctuations between orientation and disorientation, a study shows that one of the initial symptoms of delirium is the disturbance of consciousness, which frequently fluctuates, especially in the evening when external stimulation is at its lowest. The same patient's degree of awareness may swing between extremes, or it could show up as subtler symptoms like mild sleepiness or attention deficit disorder.

In fact, in more severe situations, the patient may appear noticeably sleepy, lethargic, or even semi-comatose⁽²⁴⁾. Eight percent of respondents agreed the administration of opioids medication can treat delirium while studies show that in a critically ill setting, there have been reports of delirium being brought on by opioids, hypnotics, anxiolytics, corticosteroids, anticholinergic medications, hypercalcemia, hyponatremia, dehydration, hypoxia, infections, and organic impairment to the Central Nervous System (CNS)^(9,25,10). Studies show that gender differences have different results toward delirium, in fact, in critically ill patients in adult and pediatric settings, males have the highest risk to acquire delirium than female patients^(26,27,28). A neurological measure that provides a trustworthy description of the state of consciousness is the GCS score. After noticing that 19% of our nurse responders thought the GCS was a suitable approach to screen for delirium, education about delirium screening instruments became a crucial area of attention. Participants incorrectly responded in having dementia in the family increases a patient's risk of delirium. However, studies found that a family history of dementia may lead to delirium and is considered a risk factor for delirium that negatively affects the quality of life of the patient^(3,10). Due to ageist attitudes and a lack of awareness of delirium and its clinical implications, delirium prevention activities are not commonly used in nursing practice. There is an urgent need for educational programs that broaden understanding, combat negative attitudes, and enhance delirium prevention practice. Preventing delirium has grown to be a significant global health concern. It is becoming more and more crucial for clinical practice to include the delirium prevention⁽²⁹⁾.

National guidelines in Australia, the United Kingdom, and the United States have taken into account the evidence regarding delirium prevention^(30,29,31,32). Although necessary for

delirium prevention, direct patient care tasks like assessment, family/patient interaction, nourishment, and mobility are rarely prioritized and occasionally neglected or skipped⁽³³⁾.

The study has some major limitations. First off, because the survey was only presented to the nursing staff at a specific governmental hospital setting under the umbrella of the Ministry of Health Organization in Saudi Arabia, probably, the findings cannot be applied to nurses working in other PICU settings. There is also the possibility of selection bias if the non-responders had different years of experience or understanding of delirium from the respondents, even if the respondents represented a wide variety of education and experience levels with critically ill children. In addition, lack of generalization in identifying the educational need since it is in one healthcare setting.

CONCLUSION

Pediatric patients who are critically ill face a serious problem called pediatric delirium, which calls for careful observation, detection, and treatment. Our investigation identified areas that need specialized instruction. It was concluded that the staff needed additional training to understand the significance, risk factors, and therapies for pediatric delirium before the implementation of unit-wide delirium screening. The findings may also be applied to the majority of pediatric intensive care units that employ professionals with a wide range of training and experience. Without targeted training for the staff on how to diagnose delirium, adequate screening, and associated risk factors, it is likely that the majority of critical care units, whether for children or adults, will have comparable knowledge gaps.

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Ethical Clearance

This research has been declared ethical by the Ministry of Health of Directorate of Health Affairs of Jeddah for Medical Research and Studies.

Conflict of Interest

There is no conflict of interest.

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Nursing Students' Perception of the Effectiveness of the Health Care Simulation at the University of Tabuk

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ABSTRACT

Background: Simulation has been recognized as a teaching strategy in nursing curriculum that efficiently fosters learning, competence acquisition, self-assurance, and safety of students. Simulation-based learning (SBL) has emerged as a valuable tool in nursing education, enabling students to attain the necessary clinical competencies essential for their future success.

Objective: This study aims to evaluate the nursing students' perception of the effectiveness of the healthcare simulation sessions at the University of Tabuk.

Methods: Descriptive cross-sectional design was used with 128 nursing students who responded to the online survey using the Modified Simulation Effectiveness Tool (SET-M).

Results: This study showed that almost all respondents strongly agreed on the effectivity of the healthcare simulation in the pre-briefing phase (81.65%), scenario phase (68%), and debriefing phase (74.38 %). There were no significant differences between students' responses on the effectiveness of healthcare simulation sessions across all phases between gender, age, and academic level. However, the GPA has a significant difference in pre-briefing ($P = .002$) and scenario with a ($P = .001$) except for the debriefing with a ($P = .352$) which ($P > .05$).

Conclusion: The results of the study revealed that the healthcare simulation sessions held during the Academic Year 2022 at the University of Tabuk were deemed effective in enhancing various areas and aspects essential for students' learning.

Keywords: Healthcare, simulation, M-SET, University of Tabuk, Nursing students, Saudi Arabia

INTRODUCTION

Simulation has been recognized as a teaching strategy in nursing curriculum that efficiently fosters learning, competence acquisition, self-assurance and safety of students¹⁴. Simulation is a pedagogical method that imitates clinical practice in authentic environments to teach

theoretical concepts, evaluations and clinical skills. It typically focuses on providing a supportive environment by utilizing various therapeutic scenarios². As a result of the rigorous healthcare protocols, clinical courses were temporarily suspended during the COVID-19 pandemic, leading to widespread adoption of simulation training¹.

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Simulation-based learning (SBL) has emerged as a valuable tool in nursing education, enabling students to attain necessary clinical competencies essential for their future success³. SBL is utilized in nursing schools in Saudi Arabia at various levels, either in place of or in addition to practical training, and low to high-fidelity manikins are used³. The adoption of SBL provides a secure environment to achieve teaching objectives, minimizing the possibility of causing harm to real patients. It's a safe place for students to practice skills that they have learned previously on manikins or high-fidelity simulations (HFS) without putting an actual real-life patient in danger or at risk³.

As mandated by the University of Tabuk, the Department of Nursing started to integrate simulation-based education in the first semester of the academic year 2019. This is to improve the students' clinical performance experienced in the hospital setting by building their confidence, competence, teamwork, and attitude in simulation. Therefore, it is deemed necessary to evaluate the students' perception of the effectiveness of simulation sessions to know the areas of strengths and weaknesses to further improve the simulation experience of the students.

REVIEW OF RELATED LITERATURE

A cross-sectional study was conducted in four universities situated across three major cities within the Kingdom of Saudi Arabia (KSA). The results showed that nursing students were weak in pre-briefing with (2.7%), debriefing (5.3%) and the scenario (17.1%)³. Phenomenological research was conducted in the Kingdom to explore nursing students' perceptions of their clinical encounters with HFS revealed that participants had a favorable response towards simulation experiences, which led to an increase in their confidence levels when working collaboratively during simulated sessions⁴.

The students in the nursing program who participated in a simulation session involving

standardized patients (SP) to augment their knowledge and communication abilities affirmed that the SP encounter presented them with unique experiential learning since they received immediate feedback, which was critical for improving their clinical aptitude⁹. Utilizing SP presents a considerable asset for instructing and evaluating clinical expertise, encompassing areas such as physical examination, interpersonal communication, data collection, and providing education and guidance to patients⁶.

A study was conducted in Korea to investigate the attitudes of nursing instructors and students towards SBL with a contrary to the perceptions of instructors who believed that conducting examinations using co-orientation model led to psychological strain and passive cognitive frameworks among students, these issues were not identified by the student participants in this research¹².

A study conducted in Spain about nursing students' satisfaction with OSCE in clinical simulation revealed with a high degree of satisfaction rated more than 8 out of 10 (mean score = 8.43, SD = 1.25) especially in debriefing, however, acquisition of skills in OSCE and its impact to stress and anxiety should need further study⁷. A repeat measurement method conducted was used in the study on Integrated Care in Emergency and Critical Care course about the effects of simulation-based learning on nursing students' perceived competence, self-efficacy, and learning satisfaction. The study is statistically significant after repeated exposures to simulation with $p < .001$ ⁸.

In Saudi Arabia, the extent of research on simulation and its impact on nursing students' attitudes remains inadequate. There is no research study exists as to how healthcare simulation sessions are perceived by nursing students in Tabuk region. Therefore, this study aims to evaluate the nursing students' perception of the effectiveness of the healthcare simulation sessions at the University of Tabuk.

METHOD

Research Design & Setting

This study used descriptive, cross-sectional design to gather data describing the effectiveness of healthcare simulation sessions among nursing students conducted in Clinical Simulation Unit at the University of Tabuk.

Sample

The study used random sampling to sample size of 128 students who attended simulation sessions in A.Y 2022.

Inclusion: Nursing students who participated in simulation sessions

Exclusion: Nursing students who attended simulation seminars or workshops only.

Instrument

The study used the 19-item SET-M tool which was developed by Leighton, Ravert, Mudra, and Macintosh¹³ and granted permission to be used in this study. It has three subscales with acceptable internal consistency: Pre briefing ($\alpha = .833$), Learning ($\alpha = .852$), Confidence ($\alpha = .913$), and Debriefing ($\alpha = .908$) with an overall internal consistency of ($\alpha = 0.936$). A higher score result would mean a positive perception of the healthcare simulation.

Data collection

The data collection is between the period of January 01, 2023 and February 12, 2023 after approval from the IRB of University of Tabuk. The roster of students attended simulation sessions during A.Y. 2022-2023 was requested from the program advisers across different levels. Utilizing randomization technique, the study implemented an odd-numbered selection method until achieving the targeted sample size. The participants were requested to fill out a Google Form questionnaire which was sent to them via email. A contact detail of the correspondents was provided to raise inquiries related to the questionnaire. Once the respondents finished and submitted their responses, the researcher automatically

retrieve the collected data to utilize for data analysis.

Ethical consideration

Approval was obtained from the IRB(UT-250-88-2023) on January 01, 2023. Obtaining data was done anonymously and without any forms of identification, and privacy in data collection. The risk was also mentioned such as providing their socio-demographic profile and no financial compensation involved in participation in the study. They are guaranteed their right to voluntarily participate and withdraw in the study without being coerced or deceived. Finally, the data was kept confidential on a secure device with a password to ensure privacy.

Statistical Treatment

Descriptive statistics was used for demographic characteristics and perceptions of nursing students on experience variables of healthcare simulation effectiveness. The t-test and anova were used to determine significant differences regarding the agreement level between categories of demographic characteristics. The cut-off for statistical significance was $p < 0.05$.

RESULTS

I. Respondents' Demographic profile

The male respondents were 58.8% and 42.2% were females. The data revealed that the majority of those who responded were between the ages of 22 and 24. The lowest age proportion was from the age group of >25, with 3.1% of all the respondents. The fourth year represented 65%, while the third year represented 35% of the respondents. The third year represents (35%) of the total respondents, while fourth year represent (65%) of the total respondents. The GPA (4.1-4.5) represents 33% of the total respondents, GPA (3.6-4) represents 27% of the total respondents, GPA (3.1-3.5) represents 18% of the total respondents, and GPA (4.6-5) represents 10.9% from total respondents.

II. Respondents Evaluation on the Effectiveness of Healthcare Simulation Sessions

Majority of the students have strongly agreed that the healthcare simulation sessions conducted is effective in the pre-briefing phase with a total percentage of 81.65% with a total mean equivalent of 2.79. Moreover, in scenario majority of the respondents have strongly agreed that the healthcare simulation sessions conducted is effective with a total percentage of 68% with a mean equivalent of 2.62. They state that it made them better at preparing to respond to the changes in the patient's condition, better understanding of the pathophysiology, more confident in their assessment skills, felt more empowered to make clinical decisions, a better understanding of medications, more confident in using evidence-based practice to provide care. Furthermore, in debriefing, majority were also strongly agreed with

a total percentage of 74.38% and the mean equivalent of 2.70 stating that it contributed to their learning as well as allowed them to communicate their feelings and self-reflect.

III. Significant Difference between the Students' Response on the Effectiveness of Healthcare Simulation Sessions Across the Demographic Profile.

No significant differences were identified between students' response on the effectiveness of healthcare simulation sessions in all phases and the demographic profile as to gender ($p=.20, .18, .45$), age ($P=.94, .57, .90$), and academic level ($P=.93, .31, .86$). Whereas, there was a significance difference on the students' response on the effectiveness of healthcare simulation sessions in pre-briefing and scenario phases between the GPA ($P=.00, .001$) however, no significant difference identified in debriefing ($P=.352$). Therefore, the hypothesis was rejected (Table 1 to 3).

Table I: Students' Response on the Effectiveness of Healthcare Simulation Sessions as to Gender

Gender	N	Mean	SD	P - value	T-TEST
Pre -briefing	Male = 74	2.7568	.43983	.203	4.839
	Female = 54	2.8426	.31955		
Scenario	Male = 74	2.5923	.39416	.183	2.531
	Female = 54	2.6728	.28679		
Debriefing	Male = 74	2.6865	.37901	.446	.000
	Female = 54	2.7370	.36202		

Table 2: Students' Response on the Effectiveness of Healthcare Simulation Sessions as to Age

AGE	N	Mean	SD	P - value	ANOAV(F)
Pre -briefing	19-21 =54	2.8056	.38137	.940	.062
	22-24 =70	2.7857	.41329		
	25+ =4	2.7500	.28868		
Scenario	19-21 =54	2.6389	.30672	.567	.570
	22-24 =70	2.6071	.39168		
	25+ =4	2.917	.25000		
Debriefing	19-21 =54	2.722	.37751	.902	.103
	22-24 =70	2.700	.36634		
	25+ =4	2.650	.47258		

Table .: Students' Response on the Effectiveness of Healthcare Simulation Sessions as to Academic level

Academic level	N	Mean	SD	P - value	T-TEST
Pre -briefing	3rd year =45	2.7889	.41954	.932	.244
	4th year =83	2.7952	.38283		
Scenario	3rd year =45	2.5833	.36063	.314	.359
	4th year =83	2.6496	.35013		
De-briefing	3rd year =45	2.7156	.36304	.861	.481
	4th year =83	2.7036	.37788		

Table 4: Students' Response on the Effectiveness of Healthcare Simulation Sessions as to GPA

	GPA	Mean	SD	P - value	ANOVA(F)
Pre -briefing	>3	2.4286	.67531	.002	4.451
	3.1-3.5	2.9565	.14405		
	3.6-4	2.8000	.32540		
	4.1-4.5	2.8095	.38179		
	4.6-5	2.8214	.31666		
Scenario	>3	2.3690	.38078	.001	4.725
	3.1-3.5	2.6196	.31465		
	3.6-4	2.7786	.21479		
	4.1-4.5	2.6429	.29580		
	4.6-5	2.4643	.59261		
Debriefing	>3	2.6143	.38801	.352	1.116
	3.1-3.5	2.7130	.375775		
	3.6-4	2.8114	.32879		
	4.1-4.5	2.6714	.39217		
	4.6-5	2.6429	.37767		

DISCUSSIONSEESW

This study showed that more than half of the students have had a great perception that the healthcare simulation sessions were effective. It is worth noting that most of the students who participated in our study were male, comprising 58.8%, and most of them were 4th year (65%). This trend differs from research conducted in different universities in the Kingdom where females accounted for majority (82%) of their participants and 44.5% were belong to 4th year⁷ which could suggest potential differences or limitations amongst gender and year level of respondents'

perceptions towards healthcare simulations. Furthermore, with regards to the Grade Point Average, a significant proportion of the students who took part in the study scored between 4 and 4.5 which aligns with similar studies where GPAs ranged from 4.1-4.5; simultaneously, concerning age demographics, a considerable number of participants were aged between 22 to 24 years old whereas previous research reported that most students fell within the age range of 19 to 21 years old⁷.

This research has revealed that an overwhelming majority of the participants

(81.65%, SD=.39, mean=2.79) strongly affirmed the effectiveness of healthcare simulation during pre-briefing phase. In contrast to this finding, a separate investigation conducted in three universities within the Kingdom³ reported a lower percentage (55.5%) of individuals who strongly agreed with their mean being 3.171 and SD (0.963) during pre-briefing stage; however, both studies indicate high levels of agreement in terms of pre-briefing among respondents when compared against each other's respective percentages obtained.

The phase involving a scenario received a majority response of strong agreement and was deemed effective with 68% in percentage, SD of (.35) and mean score of (2.62). When compared to the previous study that scored (53.3%) on strongly agreeing, it resulted in their mean score being 17.237 with an SD of (5.523)³, showing high percentages for both studies regarding scenarios' effectiveness. Respondents claimed that participating in these simulations helped them face patients confidently while understanding pathophysiology ultimately empowering them to make clinical decisions successfully.

During the healthcare simulation, the phase of debriefing was evaluated for its effectiveness by a majority group who strongly agreed with it at a percentage of 74.38%, an SD of (.37), and mean (2.70). This outcome closely compares to another study, where participants also strongly agreed (53.3%) that debriefing was effective; their mean score being (7.517) with an SD of (2.360)³. Both studies revealed high levels of agreement regarding debriefing in terms of student learning, expression of feelings, as well as improvements in clinical judgment and self-reflection skills among students. The findings suggest similarities between both researches. Overall, there is strong agreement on all aspects related to the effectiveness and importance of incorporating adequate debriefings into healthcare simulation sessions that can enhance educational outcomes for students delving into this phase.

The present research has revealed that gender, age and academic level have no significant difference among nursing students' perception of effectiveness of healthcare simulation sessions across all phases ($p < .05$). However, there is a significant difference in GPA for pre-briefing ($P = .002$) and scenario ($P = .001$), but not for debriefing as evidenced by non-significant results ($P = .352$; $p > .05$). Furthermore, when compared to other studies conducted on similar topics such as student GPAs in pre-briefing ($P = .437$) or scenarios ($P = .662$), it was found that there are no statistically significant differences between them except for debriefings where results were statistically significant at $P = .022$ with findings supporting hypothesis based on significance levels set at $P = > 0.05$.

CONCLUSION

The results of the study revealed that the healthcare simulation sessions held during Academic Year 2022 at the University of Tabuk were deemed effective in enhancing various areas and aspects essential for students' learning.

Recommendations

Future studies with equivalent sample sizes in literature could be employed to investigate how different students perceive the efficacy of simulations.

Conflict of Interest:

There is no conflict of interest to be declared

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Descriptive study to assess the awareness and existing practices related to Behaviour Change Communication (BCC) among In-service Auxiliary Nurses and Midwives (ANMs) for Reproductive and child health care (RCH) care.

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ABSTRACT

Introduction: As per WHO thousands of women died during and following pregnancy and childbirth however most could have been prevented. Operational Guidelines on Maternal and Newborn Health by Government of India revealed that Behaviour Change Communication (BCC) is needed to promote positive health practices for maternal and newborn health, and to discourage harmful practices. **Objective** of present study was to assess awareness of BCC and existing practices related to BCC among In-service ANMs and to assess the opinion of learning BCC by Self Learning Material (SLM) and to identify the content to be covered in SLM as teaching module.

Material and Method: Exploratory & descriptive survey design was used to Collect the baseline data in terms of their awareness and existing practices for BCC among in-service Auxiliary Nurse and Midwives (ANMs). Data collected from 20 ANMs, 10 PHNs, and 10 Medical officers working in different health units of Delhi using developed and validated questionnaire. Informed consent was taken from all the study subjects. **Results:** Findings revealed that ANMs were not aware of BCC and related practices for Reproductive and Child health care (RCH) care but conducting health education sessions and using various methods of communication like individual IPC, demonstration, home visit and use of IEC material for creating awareness in the community. ANMs were aware of dropout cases and the way to identify them but not planning and conducting BCC sessions for drop out cases. It is interpreted that in-service ANMs were in need to have awareness regarding BCC to practice in community. The data in relation to opinion on selected topics for information to creating awareness for BCC on RCH care components shows that for topics related to Antenatal care, post-natal care and child care component, there was 100% agreement from all the study samples. Majority of samples (80%) expressed disagreement for anemia and nutrition and identification of RTI and STI topics under adolescent health care component and expressed that these can be covered under maternal care component. It was suggested by majority of doctors (25%) that ANMs should have awareness on types of delay under maternal care component and major causes of maternal, neonatal and child mortality and delayed PPH as awareness on suggested topics will make them sensitize to prevent the causes of mortality. There was 100% agreement for learning BCC for RCH issues by self-learning material in booklet form and for the language preference it was expressed by all the study subject (100%) that SLM for In-service ANMs should be in Hindi. **Conclusion:** There is lack of awareness regarding, Behaviour change communication and related practices among in-service ANMs which supported the need to develop a self-learning material on BCC

Keywords: Behaviour change communication, Self-Learning Material, Reproductive and Child health care.

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INTRODUCTION

As per WHO (2012)¹ about 295 000 women died during and following pregnancy and childbirth, however most could have been prevented. Operational Guidelines on Maternal and Newborn Health by Government of India (MOH&FW statistics report 2015)² revealed that Behaviour Change Communication (BCC) is needed to promote positive health practices for maternal and newborn health, and to discourage harmful practices. (Government of India,2010.)³

Present research study aimed towards need assessment to support the development of a self-learning material on BCC for selected RCH issues for In-service ANMs.

METHODOLOGY

Exploratory & descriptive survey design was used in present study. To assess the existing status of BCC in-service Auxiliary Nurse and Midwives (ANMs) and for finalizing the content of SLM it was planned to Collect the

baseline data in terms of their awareness and existing practices for BCC among in-service Auxiliary Nurse and Midwives (ANMs).

After obtaining informed consent from 20 ANMs, 10 PHNs, and 10 Medical officers working in different health units of Delhi, data collected through developed and validated questionnaire. Analysis and interpretation of analyzed data of study presented in Table 1 to 4

Table 1: Description of demographic characteristics for study sample (ANMs, PHNs and Medical officers)

The data presented in table -1, shows that majority of sample 20(50%) belongs to the age group of 50 years and above which includes In-service ANMs 4(10%), and Medical Officers 8(20%) and PHNs 8(20%). Majority of study sample 36(90%) were female. Among study sample of In-service ANMs, only two ANMs 2 (5%) was having GNM diploma as educational qualification whereas the other 18 were having ANM diploma as professional

Table - 1: Frequency and percentage of demographic characteristics among study sample (In-service ANMs, PHNs and M.Os) for base line data. (N=40)

	Sample Characteristics	ANMs Group (20)		Medical officer In charge (10)		PHN (10)		Total=40	
		f	%	f	%	f	%	f	%
Age:	55yrs& above	Nil		4	10	6	15	10	25
	40-55 years	8	20	6	15	4	10	18	45
	25-40 years	6	15					6	15
	Below 25 years	6	15					6	15
Sex:	Male			4	10			4	10
	Female	20	50	6	15	10	25	36	90
Prof. Qualification	a. ANM	18	45					18	45
	b. GNM	2	5					2	2
	c. B.Sc. (N)					10	25	10	25
	d. MBBS			8	20			8	20
	e. MD			2	5			2	5
Experience	0-5 years	6	15					6	15
	5-10 years	2	5					2	5
	10-15 years	2	5					2	5
	15-20 years	2	5	4	10	10	25	16	40
	20 years and above	8	20	6	15			14	35

qualification. In relation to experience majority 16(40%) were having experience between 15-20 years whereas 14(35%) were having experience of more than 20 years.

Hence, it is interpreted that 30(75%) sample had experience of more than 15 years, 28(70%) were above 40 years of age which indicates that their experience helped the researcher in getting the opinion to identify the content for developing the tools and intervention for the study.

Table- 2: Description of awareness of BCC among in service ANMs .Percentage of responses of sample on related to awareness BCC among in service ANMs presented in table-2

The data presented in table -2shows that 100% ANMs expressed that they were not aware of Behavior Change Communication (BCC) and its stages. Hence, it is interpreted that there is a need to make In-service ANMs aware regarding BCC.

Description of existing practices for BCC among in-service ANMs Percentage of responses of sample on items related to existing practices for BCC among In-service ANMs presented in table 3

Existing practices related to BCC and its awareness among in-service.

Data shows that 40(100%) of study samples expressed that ANMs did not follow the practice to identify the target client for behavior change.

Study findings revealed that ANMs were not aware of BCC and related practices for RCH care but conducting health education sessions and using various methods of communication like individual IPC, demonstration, home

visit and use of IEC material for creating awareness in the community. ANMs were aware of dropout cases and the way to identify them but not planning and conducting BCC sessions for drop out cases. It is interpreted that in-service ANMs were in need to have awareness regarding BCC to practice in community.

Table-3 : Description of opinion of study samples on the selected topics for information to create awareness for BCC on RCH care components

Percentage of responses of study sample on questionnaire for opinion on the selected topics for information to create awareness for BCC on RCH care is presented in table-3

The data presented in table -3presents the opinion of study samples on the selected topics for information to create awareness for BCC on RCH care components:

The data collected shows that there was 100% agreement by all the study sample that if ANM give relevant information related to RCH care to community it will help in reducing the related complications.

The data in relation to opinion on selected topics for information to creating awareness for BCC on RCH care components shows that for topics related to Antenatal care, postnatal care and childcare component there was 40(100%) agreement from all the study samples.

There was disagreement by majority 32(80%) of study samples for topics "family planning methods". Majority of samples 32(80%) expressed disagreement for anemia and nutrition and identification of RTI and STI topics under adolescent health care

Table 2: Awareness of BCC among In-service ANMs (N-20)

	Statement	Yes%	No%
1	Are you aware of behavior change process? If yes, please tick the correct process.		100
2	Are you aware of behavior change communication .		100
3	Are you aware of stages person go through when changes any behavior		100

Table 3: Percentage of responses of sample for opinion on the selected topics for information to create awareness for BCC on RCH care components (N=40)

	Statement	ANMs (n-20)		MO(n-10)		PHN(n-10)	
		Agree%	Dis A%	Agree%	Dis A%	Agree%	Dis A%
1	Opinion on importance of providing updated relevant information related to RCH care in community * It will help in reducing the related complications	50		25		25	
2	Opinion on the selected topics for information to creating awareness for BCC on RCH care components:						
2.1	ANTENATAL CARE COMPONENT OF RCH	Agree%	Dis A%	Agree%	Dis A%	Agree%	Dis A%
	Identification and treatment of Anemia	50		25		25	
	Identification and treatment of RTI/STI	50		25		25	
	Bleeding during pregnancy / Abortions	50		25		25	
	Importance of Registration during pregnancy	50		25		25	
	Importance of regular ANC Visits during pregnancy	50		25		25	
	Importance of TT immunization during pregnancy	50		25		25	
	Importance of Diet & Iron Folic Acid supplements during pregnancy	50		25		25	
	Identification Recognition of Warning Sign during pregnancy.	50		25		25	
	Identification of Hi-Risk Pregnancy	50		25		25	
2.2	POSTNATAL CARE COMPONENT OF RCH	50		25		25	
	Importance of Institutional Delivery	50		25		25	
	Planning for Confinement	50		25		25	
	Immediate Essential Newborn Care:	50		25		25	
	Recognition of Danger Sign in newborn baby	50		25		25	
	Fever/ Sepsis within one week after delivery	50		25		25	
	Post-Partum Hemorrhage	50		25		25	
	Breast Engorgement	50		25		25	

	Statement	ANMs (n-20)		MO(n-10)		PHN(n-10)	
		Agree%	Dis A%	Agree%	Dis A%	Agree%	Dis A%
	Poor Lactation/Breast Feeding Practices	50		25		25	
2.3	FOR CHILD CARE COMPONENT OF RCH	50		25		25	
	Identification and treatment of Pneumonia/ARI	50		25		25	
	Identification and treatment of Diarrhea	50		25		25	
	Importance of Exclusive Breast Feeding	50		25		25	
	Infant and Young Child Feeding practices	50		25		25	
	Importance of Immunization	50		25		25	
2.4	ELIGIBLE COUPLE CARE						
	Identification and treatment of RTI/STI*	50*		25*		25*	
	Family planning methods	10	40	10	15		
2.5	ADOLESCENT HEALTH CARE COMPONENT OF RCH						
	Anemia and Nutrition*	50*		25*		25*	
	Sexuality	10	40	10	15		
	STI and HIV *	10	40	10	15		
	Life skills	10	40		25		
	Any other *Can be covered under maternal care. ** Delay in seeking care and major causes of Maternal, neonatal and Child mortality and delayed PPH						

component and expressed that these can be covered under maternal care component.

There was 32(80%) disagreement in relation to topic like sexuality and life skills under adolescent care component and it was expressed that these topics has been covered in various training program recently .

It was suggested by majority of doctors 10 (25%) that ANMs needs to have awareness on knowledge related to types of delay under maternal care component and major causes

of maternal, neonatal and child mortality and delayed PPH as awareness on suggested topics will make them sensitize to prevent the causes of mortality.

For topics related to Antenatal care, postnatal care and childcare component there was 40(100%) agreement from all the study samples.

There was disagreement by majority 32(80%) of study samples for topics "family planning methods". Majority of samples

32(80%) expressed disagreement for anemia and nutrition and identification of RTI and STI topics under adolescent health care component and however experts expressed that these topics may be covered under maternal care component.

Table-4: Description of Opinion of study sample on review/refresh information related to RCH care among in-service ANMs. Percentage of responses of Opinion of study sample on review of information related to RCH care among in-service ANMs is presented in table 4

The data presented in table -4 shows that the data shows that there was 40(100%) disagreement expressed by all the study subjects regarding review of information by ANMs on the suggested topics as they do not have any source for review whenever required. There was 40(100%) disagreement from all the study samples regarding opportunity

in participation of ANMs in "In service training on BCC for RCH care". Further the data presented in Table-4 shows that all the sample 40 (100%) agreed for the opinion that if ANMs get self-learning material in booklet form on BCC for RCH issues, they will read it and use it for creating self-awareness. Audio & Video CD and softcopy material was not the part of study. For the language preference it was expressed by all the sample 40(100%) that SLM for In-service ANMs should be in Hindi.

Hence, it is interpreted that SLM can be an effective tool for creating awareness among In-service ANMs regarding BCC for selected RCH issue and may be used for Self-awareness.

RESULTS

In relation to awareness of behavior change process, Behavior change communication

Table 4: Opinion of study sample on review of information related to RCH care by In-service ANMs

	Statement	ANMs (n=20)		MO (n=10)		PHN (n=20)	
		Agree%	Dis A%	Agree%	Dis A%	Agree%	Dis A%
1	Opinion on review information by ANMs on the suggested topics. If yes, how: If No, why: They do not have any source provided with to review.		100		100		100
2	Practices related to participation in any training on BCC for RCH care.		100		100		100
3	Opinion on acceptability if self-learning material on BCC for RCH issues.	100		100		100	
4	Opinion on which type of self learning material will be acceptable for ANMs: Booklet Audio CD Video CD Soft copy material	100		100		100	
5	Opinion on language in which your ANMs/you want self-learning material should be: Hindi English	100		50		50	

and stages of Behaviour change among ANMs it was expressed that ANMs were not aware, neither they knew how to identify the target client for behavior change. In terms of planning a BCC session for drop out cases it was expressed by study subjects that they coordinate with ASHA or when ANMs go to field and if meet with drop out cases then try to motivate them by health talk . It was expressed that ANMs have not attended any training on BCC and neither they review themselves the relevant information on selected topics.

There was 100% agreement for the opinion that if ANMs get self-learning material in booklet form on BCC for selected RCH issues, they will read it and use it for creating awareness.

DISCUSSION

In present study there was lack of knowledge regarding BCC for ANC care components among In-service ANMs.

Like present study findings Haruna et al. (2010)⁴ reported that midwives in Tokyo expressed their lack of expertise in behaviour change communication (BCC).

In congruence to the findings of present study it was revealed by Novick (2009)⁵ that target people for MCH care desired comprehensive and relevant information to clear their doubts, and enable them take informed decisions similarly, the women in study of Bridgit Omowunmi et al (2013)⁶ mentioned issues about which they wanted more information.

The overall findings of Kaushik LK (2012)⁷ were similar to present study that counseling skills were lacking in a substantial proportion of HW-F which indicates a need to train them in these aspect, for improving ANC services in peripheral and rural set-up where these HW-F are the main functionaries to deliver care.

CONCLUSION

There is lack of awareness regarding, Behaviour change communication and ANMS

supported the need to develop self-learning material on BCC for selected RCH.

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Ethical clearance-

The study was approved by the research Unit of Indira Gandhi National Open University (IGNOU), Delhi. Research problem and objectives were approved by the Doctoral committee of School of health sciences IGNOU. Prior permission was obtained from management of all the selected health units covered in the study.

Source of funding- Self

Conflict of Interest: - nil

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A Study to Assess Effectiveness of STP on Knowledge and Expressed-Practice regarding OSCE among Nursing-Tutors of Selected Colleges of Gujarat

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ABSTRACT

Background and Objectives: OSCE has been widely and increasingly used now-a-days. The OSCE is comprised of several stations; examinees are expected to perform a variety of clinical tasks within a specified time period. Performing a variety of clinical skills, in the laboratory there by evaluating competency of skills is possible. Investigator had conducted this study to assess the knowledge and expressed practice of nursing tutors before and after administration of Structured Teaching Programme on OSCE. And to find out the correlation between post-test knowledge and post-test expressed practice score on OSCE among nursing tutors of selected self-finance nursing colleges. **Methods:** A pre-experimental research design was used for this study. For data collection, structured tools were prepared which consists of three parts, first part deals with demographic data, second and third part includes structured quantitative questionnaire. Simple random sampling technique was used to select potential participants. Total 50 participants were selected with chit and lottery method for this study. **Results:** The study revealed that mean post-test knowledge score (14.1) was higher than mean pre-test knowledge score (7.52). The mean post-test expressed practice score (8.1) was higher than mean pre-test expressed practice score (3.56). There is an existence of a positive correlation ($r = 0.66$) between knowledge and expressed Practice. **Conclusion:** The participants gained knowledge after delivering structured teaching about OSCE. There is positive co-relation between knowledge and expressed practice. So, it proves that structured teaching program is effective in imparting knowledge of OSCE.

Keywords: Structured Teaching Program, Objective Structured Clinical Examination, OSCE, STP

INTRODUCTION

Examinations are the vital and integral part of nursing field. The clinical performance is assessed by conducting a practical examination by using rating scales and observational checklist.

Potentiality of Objective Structured Clinical Examination to test the wide range of

skill, and safe practice in terms of psychomotor skill assessment as well as declarative and schematic knowledge associated with its application. At the same time, it provides the technique appropriate to use for many students. To organize the examination in a laboratory setting, like the natural setting, evaluating the student's competence by OSCE may be an appropriate alternative.

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BASHIR A., TAHIR S., NASIM A., AND KHAN J.S.^[1] stated in a phenomenological qualitative study that the assessments are an integral part of student's evaluation. The way these assessments are carried out is important because a substandard, unstructured assessment can put a question mark on the face of assessment in terms of validity, reliability, acceptability and educational impact. In their study the main concern of participant was to further improve the construction of Objective Structured Practical Examination (OSPE) station by making more clinical skill-oriented stations and to increase the OSPE bank to avoid repetition of questions. Moreover, it is costly and time-consuming job for which faculty should be properly paid, made trained and refrained from involving into administrative work. In this study OSPE was favoured as a method that should be continued as an assessment method.

STATEMENT:

A Study to Assess Effectiveness of STP on Knowledge and Expressed-Practice regarding OSCE among Nursing-Tutors of Selected Colleges of Gujarat

OBJECTIVES OF THE STUDY

1. To assess the knowledge of nursing tutors before and after administration of Structured Teaching Programme on OSCE in selected self-finance nursing colleges of Ahmedabad city
2. To assess the expressed practice of nursing tutors before and after administration of Structured Teaching Programme on OSCE in selected self-finance nursing colleges of Ahmedabad city
3. To find out the correlation between post-test knowledge and post-test expressed practice on OSCE among nursing tutors of selected self-finance nursing colleges of Ahmedabad city

HYPOTHESIS OF THE STUDY

H1 The mean post-test knowledge score of participants after administration

of Structured Teaching Programme on OSCE will be significantly higher than their mean pre-test knowledge score as determined by structured knowledge questionnaire at 0.05 level of significance

H2 The mean post-test Expressed Practice score of participants after administration of Structured Teaching Programme on OSCE will be significantly higher than their mean pre-test expressed practice score as determined by structured expressed practice questionnaire at 0.05 level of significance

H3 There will be significant correlation between post-test Knowledge and post-test Expressed Practice of participants after Administration of Structured Teaching Programme on Objective OSCE

MATERIAL AND METHOD:

In present study researcher performed pre-experimental pre-test post-test design research in selected self-finance nursing colleges of Ahmedabad city. Researcher conducted study on 50 representative participants through simple random sampling method. In this study, tool had 3 sections named section-1 (5-demographic variables) section-II (20-structured knowledge questionnaire) and section-III (10-structured expressed practice questionnaire). Tool was validated by 8 experts comprising of 7 Nurse Educators (7 Master of science in Nursing) and 1 Ph.D. in Education. Ethical committee approval was obtained. Investigator adopted probability sampling technique to select the Samples, in that simple random sampling method was used. For the Sample selection, first investigator divided the Ahmedabad city in five zones. Nursing colleges were selected from each zone by lottery method. Participants who were willing to take part and available at the time of data collection had signed written consent. Confidentiality of the participants was maintained.

Due authority from all the related head of Institutions was obtained. Pre-test was conducted in selected nursing colleges of Ahmedabad city and structured teaching was administered by researcher. After 7 days researcher took post-test for the study. 7days gap between administration of structured teaching program and post-test was there to assess retained knowledge of participants regarding Objective Structured Clinical Examination. Descriptive and inferential statistics were used to analyse the demographic data, structured knowledge questionnaire and structured expressed practice Questionnaire. Paired t-test was used to analyse effectiveness of structured teaching program, Karl Pearson formula is used to find correlation. The study was delimited to selected self-finance nursing colleges of Ahmedabad city.

FINDINGS

Statistical analysis was executed on IBM SPSS 25 and Microsoft Excel-2016. In descriptive statistics, frequency and percentage were calculated. In inferential statistics, Paired T-test was used to find out the difference between knowledge of expressed practice. Karl-pearson test was used to find correlation between knowledge and expressed practice.

ANALYSIS OF DATA

After collecting the data, the information was organised and presented under the following sections:

Section-I: Analysis related to the demographic variables of the participants in frequency and percentage distribution

Section-II: Analysis related to the pre-test and post-test knowledge score.

Section-III: Analysis related to the pre-test and post-test expressed practice score.

Section-IV: Analysis related to correlation between post-test knowledge and post-test expressed practice score.

SECTION-I

Analysis related to the demographic variables of the participants in frequency and percentage distribution

Table-1 depicts percentage and frequency wise distribution of participants demographic data.

Table1 shows Frequency, Percentage wise Distribution of the participants based on Demographic data

(N=50)

Sr. No.	Demographic Variables	Frequency (f)	Percentage (%)
1	Age Group		
	22 – 30 years	45	90%
	31 – 40 years	01	02%
	41 – 50 years	00	00%
	51 years and above	04	08%
2	Gender		
	Female	46	92%
	Male	04	08%
3	Professional Qualification	44	88%
	B. Sc. Nursing	06	12%
	P. B. B.Sc. Nursing	00	00%
	M.Sc. Nursing	00	00%
	Others		
4	Total Teaching Experience	35	70%
	0 - 1 years	10	20%
	2 - 5 years	3	06%
	6 - 10 years	2	04%
	Above 10 years		
5	Attended any Training, Conference, Workshop, In Service Educational Program related to OSCE		
	Yes	00	00%
	No	50	100%

Section-II

Analysis related to the pre test and post test knowledge score.

Table-2 depicts Among 50 participants, Pre-Test Knowledge Score was 376 and Mean Pre-Test Knowledge Score was 7.52 (37.6%) Whereas Post Test Knowledge Score was 705 and Mean Post Test Knowledge Score was 14.1 (70.5%). Mean Difference between Pre Test Knowledge and Post Test Knowledge was 6.58 and 32.9% Mean Percentage Gain of the participants on OSCE.

Table-3 Among 50 participants, in Pre Test 24(48%) had poor Knowledge Score, 26(52%) had average Knowledge Score and no one had good Knowledge Score. Whereas in Post

Test 32(64%) were average Knowledge Score, 18(36%) were good knowledge score and no one had poor Knowledge Score regarding OSCE.

Table-4 depicts that calculated "t" value ($t=15.3$ at 49 degrees of freedom with 0.05 level of significance) was greater than tabulated "t" value ($t=2$) which was statistically proved. The Structured Teaching Programme was effective and null hypothesis was rejected and research hypothesis H1 was accepted.

Section-III

Analysis related to the pre-test and post-test expressed practice score.

Table-5 depicts that among 50 participants, Pre-Test Expressed Practice Score was 178

Table2 : Obtained Score, Mean Score, Mean Percentage, Mean Difference, Mean Percentage Gain of Pre-Test and Post Test Knowledge of the participants regarding OSCE.

Knowledge	Max Score	Obtained score	Mean Score	Mean Percentage (%)	Mean Difference	Mean Percentage Gain (%)
Pre-Test knowledge score	20	376	7.52	37.6	6.58	32.9
Post Test knowledge score		705	14.1	70.5		

Table 3: Frequency and Percentage wise distribution of the participants based on Knowledge score regarding OSCE

Knowledge Score	Level	Pre-Test		Post Test	
		Frequency	Percentage	Frequency	Percentage
		(f)	(%)	(f)	(%)
0 - 7	Poor	24	48	00	00
8 - 14	Average	26	52	32	64
15 - 20	Good	00	00	18	36
Total		50	100	50	100

Table 4: Mean, Mean Difference, Standard Deviation, Standard Error and 't' Value of Pre-Test and Post Test Knowledge Score of the participants.

Knowledge	Mean	Mean Difference	SD	SE	Calculated 't' Value	Tabulated 't' Value*
Pre-Test	7.52	6.58	1.47	0.44	15.30	2.0096
Post Test	14.1		2.74			

and Mean Pre-Test Expressed Practice Score was 3.56(35.6%) Whereas Post Test Expressed Practice Score was 405 and Mean Post Test Expressed Practice Score was 8.1(81%). Mean Difference between Pre-Test Expressed Practice and Post Test Expressed Practice was 4.54 and 45.4% Mean Percentage Gain of the participants.

Table-6 depicts that among 50 participants in Pre-Test 23(46%) had poor Expressed Practice Score, 25(50%) had average Expressed Practice Score, 02(04%) had good Expressed Practice Score Whereas in Post Test 50(100%) were had good Expressed Practice Score and no one had poor and average Expressed Practice Score.

Table 7 shows Mean, Mean Difference, Stan

Table-7 Table depicts calculated "t"

value ($t = 19.382$) was greater than tabulated "t" value ($t = 2.0096$) which was statistically proved. Hence the Structured Teaching Programme was effective and null hypothesis was rejected and research hypothesis H2 was accepted.

Section-IV

Analysis related to correlation between post-test knowledge and post-test expressed practice score.

Table-8 depicts Correlation between Post Test Knowledge and Expressed Practice score of samples regarding OSCE. The Correlation Coefficient obtained by using Karl Pearson's formula which is $r=0.66$. It suggests a Positive Correlation between the Post Test Knowledge and Post Test Expressed Practice Scores of participants.

Table 5: Obtained Score, Mean Score, Mean Percentage, Mean Difference, Mean Percentage Gain of Pre-Test, and Post Test Expressed Practice of the participants on OSCE.

	Max Score	Obtained score	Mean Score	Mean Percentage (%)	Mean Difference	Mean Percentage Gain (%)
Pre-Test expressed practice score	10	178	3.56	35.6	4.54	45.4
Post Test expressed practice score		405	8.1	81		

Table 6: Frequency and percentage wise distribution of the Samples based on Expressed Practice score regarding OSCE.

Expressed Practice	Mean	Mean Difference	SD	SE	Calculated 't' Value	Tabulated 't' Value*
Pre-Test	3.56	4.54	1.52	0.23	19.38	2.0096
Post Test	8.1		1.01			

Table 7: Mean, Standrd Deviation, Standard Error and 't' Value of Pre-Test and Post Test Expressed Practice Score of the participants.

Expressed Practice	Mean	Mean Difference	SD	SE	Calculated 't' Value	Tabulated 't' Value*
Pre-Test	3.56	4.54	1.52	0.23	19.38	2.0096
Post Test	8.1		1.01			

Table 8: Correlation between Post Test Knowledge Score and Post Test Expressed Practice Score of the participants.

Karl Person's Correlation Coefficient (r)				
Post Test Knowledge mean score (x)	Post Test Expressed Practice mean score (y)	Number of participants	Correlation coefficient (r)	Inference
14.1	8.1	50	0.66	Significant positive correlation at 0.05 level of significant

Hence, Hypothesis H3 was accepted.

It is Significant that if the Knowledge of the participants increases then the Expressed Practice of participants is tending to increase.

DISCUSSION:

In this study investigator had assessed the effectiveness of Structured Teaching Program in terms of Knowledge and Expressed Practice regarding OSCE.

The research approach used for the study was Pre-Experimental with Pre-Test Post Test design. Present study was undertaken at selected self-finance nursing colleges of Ahmedabad city. Structured Teaching Programme was developed by reviewing literature on OSCE in terms of Knowledge and Expressed Practice. The study comprised total 50 participants. The tool use for gathering necessary data were a structured knowledge questionnaire to assess knowledge, structured expressed practice questionnaire to assess expressed practice regarding Objective Structured Clinical Examination. The investigator collected the data by establishing the report with the subject and confidentiality of their response was assured.

Descriptive and inferential statistics methods were used to analyse the data. Knowledge and Expressed Practice deficit in all the area of Objective Structured Clinical Examination among participants.

A similar study was conducted by Mary Brosnan William Evans, Eileen Brosnan and Gary Brown^[4] in Ireland in the year 2005. This study was conducted to evaluate the process and outcomes of OSCE from the perspective of the major stakeholder groups: first- and second-year nursing students, lecturers, clinical placement coordinators and assessors. The Objective Structured Clinical Examination process was found to have a positive impact on all stakeholders. OSCEs were perceived to be a meaningful and fair form of assessment. Students identified that they felt more prepared for and more confident about forthcoming placements. Researcher also added that objective structured clinical examination perceived to be a stressful experience and requires considerable preparation effort by students and academic staff. So, it is useful and reliable method of evaluation but on other hand it requires more preparation and accuracy.

CONCLUSION

Based on the analysis of this study, investigator found out that the Structured Teaching Programme was effective in increasing Knowledge and Expressed Practice regarding

1. A similar study can be conducted on large scale.
2. A comparative study can be conducted to compare the knowledge and practice regarding Objective Structured Clinical Examination among nursing tutors in Government and private Nursing colleges.

3. A descriptive study can be conducted to assess the Knowledge and Expressed Practice of Nursing Tutors regarding Objective Structured Clinical Examination.

CONFLICT OF INTEREST: No

SOURCE OF FUNDING: Self

ETHICAL CLEARANCE: Obtained from Gujarat Institute of Nursing Education and Research, Ahmedabad IEC.

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Student Nurses' learning outcome and perceptions: Comparison of effectiveness of Online blended learning, flipped classroom approach and Online learning on course Nursing Research and statistics

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ABSTRACT

Introduction: Academicians are encouraged to work for advance mode of delivery in education under the National Education Policy 2020. In order to provide high-quality Nursing care, evidence-based practice (EBP) is essential, and this necessitates delivering quality nursing education for research. Successful researchers are essential for fostering a nursing workforce equipped with analytical, critical thinking, and problem-solving abilities. According to National education policy 2020. Research methods should be learned as early as possible.

Method: A mixed-method research approach was applied to compare B.Sc. Nursing 3rd year undergraduates' knowledge, attitude, skills, and active learning using quasi experimental design. Three modern educational styles flipped learning, online blended learning and online learning were selected to teach nursing research and statistics. Student nurses of B.Sc. Nursing 3rd year from three institutes are selected in this study using enumerative sampling technique.

Result: In flipped learning the value of mean was 5.27778 with a standard deviation of 0.9478, in online blended learning 5.055556 with a SD 1.177201 and in online learning 4.973684 with a SD 0.853826. Interest is shown by participants in the method the way research subject is taught these are the findings of the pilot study main study is in progress.

Discussions: In this applied research we have found flipped learning and Online Blended Learning has great impact on knowledge and active learning enhancement as compared to Online learning of UG Nursing students Studying Nursing research course.

Keywords: *flipped learning; online blended learning; online learning; knowledge; active learning; attitude, nursing research & statistics course and student nurses.*

INTRODUCTION

With the advent of new computing technologies, online education has

become increasingly popular.¹. In this method online platform available to teach student as live classes, e books

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can be provided, discussion can be done on online platform such as google meet, zoom, Microsoft team's platform are commonly used in such teaching method but again it is teacher centred pedagogy. In the fast-changing field of nursing research education, educators must adopt 21st-century instructional methods². Traditional techniques and unorganised online material may not be enough to prepare 21st century nursing students for their profession's problems. Blended and flipped learning help here².³. Traditional teaching approaches may neither engage students or equip them for nursing research's intricacies². 21st-century nursing education requires new teaching methods in a fast-changing society⁴ whereas flipped learning and blended learning make teachers as facilitator and mentor and student come in the centre. Blended and flipped learning can boost student engagement, active learning, and critical thinking. Healthcare practices and patient outcomes depend on nursing research. Nurses must be trained to conduct high-quality research. These creative teaching approaches to nursing research education can establish dynamic learning settings that promote inquiry-based learning, problem-solving, and critical research literature interpretation⁵. Interactive online modules and virtual simulations provide students better course engagement. Blended learning usually mixes online and face-to-face traditional instruction method. It combines the benefits of both methods to give students a more flexible and dynamic learning environment. Blended learning lets students' self-pace online activities, discuss with classmates, and receive tailored feedback from teachers. Blended learning can also encourage student participation. Students can actively participate in course content and collaborate with peers online through conversations and group projects⁵. In addition to these benefits, blended learning in nursing education has

certain limitations. For seamless online engagement, instructors must guarantee that all students have stable internet connections and adequate technology tools. Planning and instructional design are also needed to create effective online modules⁶. Faculty preparing quality online material takes effort and may require training. Less face-to-face connection makes it harder to keep students engaged throughout the course. Teachers must use regular feedback, interactive discussion forums, and real-time virtual sessions to engage students. There are many types of blended learning method which are blended or mixed with traditional teaching method such as one of them is flipped learning. Flipped learning is a growing educational method that changes classroom dynamics. Flipped learning involves delivering knowledge outside of class and leveraging class time for interactive activities. Students study pre-recorded video lectures or reading material before class in flipped learning⁷. They can learn foundational material at their own speed. Active engagement in classroom through conversations, problem-solving, panel flipped class room and collaborative projects etc. occurs in class⁷. Flipped learning encourages student-centred learning by transitioning from passive listening to active engagement. Students can practice class concepts outside of class and get rapid feedback from classmates and teachers. This improves comprehension and critical thinking. Flipped learning has its challenges. Educators must plan ahead to prepare pupils for class activities. If not addressed, technology access may also hinder students. Despite these obstacles, many teachers have successfully used flipped learning and seen great results¹⁰. Instructors can use online platforms and multimedia content development tools to generate interesting pre-class lessons for various learners. In this study online learning, online blended learning and flipped learning pedagogy

is applied to teach students of B.sc nursing 3rd year.

BACKGROUND AND PURPOSE OF THE STUDY

Nursing students' perceptions of a fundamental research subject among graduate nursing students reflected in dissatisfied way through many studies⁸. National education policy 2020 highlighted the importance of using modern technology in preparation of 21st generation learners especially for professional skills. In this pilot study student's knowledge, attitude, active learning was assessed during flipped learning, online blended learning and online class room teaching method for teaching Nursing research and statistics course to B.Sc. Nursing 3rd year students.

RESEARCH METHODOLOGY:

RESEARCH APPROACH

A mixed-method research approach was applied to compare B.Sc. Nursing 3rd year undergraduates' knowledge, attitude and active learning level. **Research design:** quasi experimental non-equivalent post-test only control group design.

Demographic variables: institution name, Roll no., name, age, gender.

Sample and Sampling technique:

Enumerative selection of students in Online blended learning (36), flipped learning (37), and online learning (38) in three nursing institutions of Haryana, M.P and Rajasthan. Inclusion criteria: Students included: 1. Studying in undergraduate nursing program in 3rd year in the selected Indian nursing council affiliated Nursing Colleges .2. Having willingness to participate

in the study.3. Having uninterrupted internet supply and smartphone/laptop/desktop/tablet. Exclusion criteria: The students whose attendance is short as per institutional policy (less than 80%) will be excluded from data collection. **Description of tool:** tool in this study consist of sections for assessment of Socio Demographic variables, Structured knowledge questionnaire(section-ii),The Modified Attitudes Toward Research (ATR) scale(section-iii),Modified checklist for assessing active learning(section-iv), Self -structured Evaluation checklist for assessing Research skill(section-v), Open ended question regarding experiences during learning Nursing research course (section vi).**Procedure for data collection:** data collection is done after teaching intervention and whole data is collected by paper pen method in the respective institute of students and later on submitted by research subject teacher to the researcher through mail. **Ethical consideration:** students were asked for their willingness in their research study and all procedure were very well explained by researcher in orientation session before starting the teaching intervention through google meet. Institutional permissions were also taken before starting the pilot study. **Plan for data analysis:**In this pilot study data is analysed using descriptive statistics only and identifications of fewthemesthrough students' responses.

RESULT

Total number of students from B.Sc. nursing 3rd year enrolled in this study were 111 out of which 69% were female and rest 31% were male students. mean

Table 1: Knowledge and attitude assessment in flipped learning, online blended learning and online learning

Knowledge assessment	Flipped Learning N=36	Online Blended learning N=37	Online learning N=38
Mean and Standard deviation	5.277778 0.974272	5.055556 1.177201	4.973684 0.853826
Range	2-7	2-7	2-6
Attitude assessment	21%	21 %	7.8%

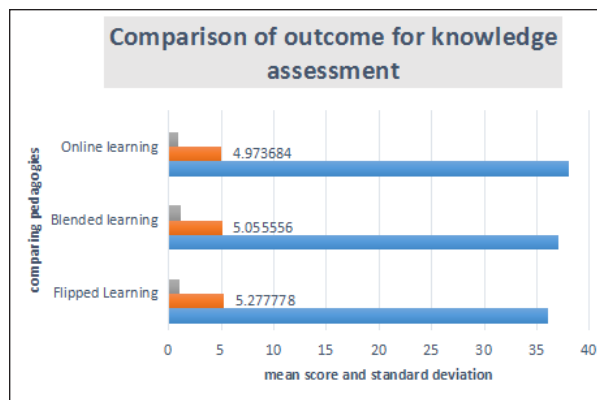


Fig. 1: comparing knowledge level among student of flipped learning classroom, online blended learning and online class room.

Table 2: active learning level in Flipped learning, online blended learning and online learning

Participants (score)	Flipped Learning (36)	Blended learning (37)	Online learning (38)
Highly active	3	2	1
Very active	15	12	13
Active	15	21	18
Less active	3	2	6
Not active s	-	-	-

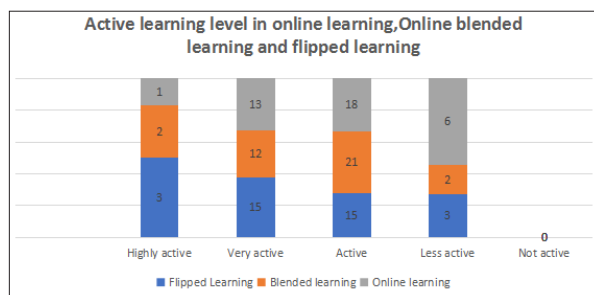


Fig. 2: Active learning presentation online learning, online blended learning and flipped learning

age group was 19 years in boys and 20 years in girls. In the pilot study UG student nurses' knowledge assessment during flipped learning (FL) was 5.277778; SD-0.97, Blended learning (BL) 5.05555; SD- 1.17 and in Online learning (OL) 4.973684 and SD:0.85 (Table 1 and Figure 1). Active learning was observed 3,2,1 in FL, BL and OL resp. (Table 2) flipped learning showed highest active learning level among all three teaching methods

(Figure 2). Good attitude for Nursing research was found in 21% of students in FL and BL whereas 7.8% in online learning (Table 1).

Qualitative analysis: open ended questions were asked at the end of quantitative data collection by interview method.

- **What do you think about Importance of research:** Can solve Nursing education problems, can solve clinical problems, can solve community problems, can solve management problems.
- **What can be the Role of a research nurse:** Assist in data collection, Follow protocol on patients, Check evidence .
- **What are your Views about benefits of teaching method:** Flipped learning is very Interesting, makes us busy, enhance Reading skills, activities are interesting.
- **What are problems faced by students in this teaching method:** Time consumption, has to read many things, some teachers say research is important at PG level makes us demotivated.

DISCUSSION

Online learning method shows comparatively less active learning development and less knowledge score when compared with flipped learning and online blended learning⁹. The above findings show that there is high impact of online blended learning¹⁰ and flipped learning on enhancing knowledge, attitude and active learning among student nurses. This result is also supported by previously conducted studies among nursing students^{11,12,13}. This study is a pilot study and it shows feasibility to apply selected teaching methods such as Online learning, online blended learning and flipped learning in conduction of main study for better learning outcome and active learning enhancement. Qualitative analysis shows sub theme such as interest in teaching Flipped learning method, development of reading skills, interest in activities Role of a research nurse for Assisting in data collection, Follow

protocol on patients, Check evidence. Importance of research reflect as: problem solving for clinical problems, community problems, management problems which reflect development of problem-solving skills, critical thinking among student and application of research studies in nursing practices.

LIMITATION

1. Sample size and duration of this study is comparatively small to generalise the result.
2. Skill was not checked as it was a pilot study only.

CONCLUSION

Flipped learning and online blended learning has enhanced research knowledge level and develop favourable attitude and a positive perception about Nursing research and statistics subject.

Conflict of interest: None

Grant: None

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Need to Educate Student Nurses for Eye Care: A Descriptive Analysis of Student Nurses' eye health literacy

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ABSTRACT

Background: Eye health is really important for health care professionals. Nursing care needs a lot of seeing, from charts and digital data to patients' faces. Nurses need good vision to provide quality treatment. The nurses' job should be reviewed and documented appropriately, so eye health is vital. Nurses exposed to more online education during student time risk eye health and work errors.

Materials and Methods: This study was conducted with a detailed descriptive cross-sectional research design. A pre-validated self-structured questionnaire was used to collect data. Using descriptive statistics, student nurses' demographics, knowledge, and practice scores were described for care of eyes while attending Online classes. The association between demographic variables and student nurse knowledge and practice was studied using a chi-square test and correlation coefficient.

Results: The Mean knowledge score of student nurses regarding the prevention of eye problems during online learning was found to be 11.43, SD 2.36 and the Mean practice score was 4.42 and SD 1.53. A significant positive linear relationship between knowledge and practice relationship was found ($r=0.47, p=0.004$).

Conclusion: There is a gap between the knowledge and practice scores of student nurses for eye health while learning online. Eye health literacy as well as good eye health practices are highly needed among student nurses.

Key words: Knowledge, practice, Eye care, Student Nurses, Online learning.

INTRODUCTION

E-learning is found to be positively correlated with eye health problems, i.e., eye fatigue-asthenopia that manifests itself with complaints such as eye discomfort, tearing, dryness, blurred vision, inability to focus, foreign body sensation, digital eye strain, computer vision syndrome, dry eyes, headache, heavy eyelids^{[1][2][3][4]} Also, uncorrected refractive errors, accommodative & ? anomalies, altered blinking pattern,

excessive exposure to intense light, improper lightening & posture, closer working distance & smaller font size can cause such ocular symptoms^[5]. These symptoms can be managed by adopting healthy lifestyle habits such as using the 20/20/20 rule^[6], ensuring room is well lit, regular eye examinations, and maintaining a healthy dietary pattern^[7]. Regular eye exercises, eye protection, good posture, frequent washing of the eyes, and remembering to blink while taking online

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classes [8-10] Review of Many studies have helped us in developing the desired structure of a tool for assessing the knowledge and practise of student nurses [11][12][13][14] A detailed descriptive study was conducted to assess the knowledge regarding eye health and practise for the prevention of eye problems due to prolonged hours of online classes among undergraduate nursing students in the year 2020. The aim of this study is to identify the knowledge and practise of undergraduate nursing students regarding the management of eye health because, in today's era, nurses should have healthy vision in order to ensure the quality of nursing care [15][16] Quality Nursing care includes all the procedures from admission till discharge, like performing assessments, making nursing diagnoses, developing intervention plans, implementing care (drug calculation, monitoring fluid intake and output, ambulation, maintaining hygiene, and providing education) and making evaluations to modify patient care [16] [17] All the care provided by the nurses should be properly documented, which is feasible by maintaining eye health [18]

MATERIALS AND METHODS

This study was conducted From November 2020-March 2021 using quantitative approach a detailed descriptive design was adopted to analyse the knowledge and practise of student nurses regarding eye care while attending online classes with. Size of study sample calculated was 300 Which was calculated using formula $n = \frac{Z^2 P(1-P)}{d^2}$. A total of 320 students were taken for the study by cluster sampling method. The study was conducted in different Nursing colleges of North India States, such as in U.P., Haryana, M.P., Rajasthan, and Odisha. In this study, a self-structured Pre validated questionnaire was developed. Tool consist of knowledge and practice questionnaire and data was collected for a period of one month from January 2021 to February 2021. Face Validity and content validity of tool is maintained by school of Nursing, XXX University. Tool was sent for validation

among 4 specialists in nursing education and nursing research working in higher education sector in India. All the necessary recommendation given by expert were included in tool. Tool was shared as google form through e-mails. A Pilot study was carried among 50 student nurses to check the reliability of tool and it was found to be reliable by Cronbach's alpha method (0.87). The tool consists of three parts. **Part I:** Assessing socio-demographic data by closed-ended questions **Part II:** Assessing Knowledge Regarding Eye Health by closed-end questions scores of yes or no were recorded as 1 or 0, respectively. **Part III:** Assessing the practise of prevention of eye problems with the help of closed-ended questions related to interventions they perform to improve their eye health. The total score was converted into a percentage and was interpreted as follows: - >80%-Excellent Knowledge, >50-79% Average Knowledge, 50% Inadequate Knowledge. **Ethical consideration:** Written consent was taken from each participant in the research regarding their willingness to participate in this study. Permission was taken to conduct this study from institutional Review board. Objectives of the study are explained to participants in brief description about the study before data collection. Privacy of information while data collection was maintained by giving participant unique id no. and not sharing information at any place or with any person.

RESULT

Demographic assessment: A total number of 320 students responded to the questionnaire within the set time frame. Students were asked to fill in their socio demographic characteristics in Google form [Table 1].

The mean age of the students was 20 out of total 320 sample 114 (35.62%) were males and 206 (64%) were female. 14.06% were students in B.Sc. Nursing 1st year, 42.18% were in B.Sc. Nursing 2nd year, 20.93% were in BSc. Nursing 3rd year, and 22.5% were in B.Sc. Nursing 4th

Table 1: Frequency and percentage distribution of socio-demographic characteristics.

				N=320
Demographic Group	Subgroup	Frequency	Percentage (%)	P = 0.05
Age	16 – 18	19	5.93%	Not significant
	18 – 21	255	79.68%	
	22 – 25	41	12.81%	
Gender	Female	206	64.4%	Not significant
	Male	114	35.6%	
Class	B.Sc. Nursing 1st year	73	22.81%	Not significant
	B.Sc. Nursing 2nd year	67	20.93%	
	B.Sc. Nursing 3rd year	135	42.18%	Not significant
	B.Sc. Nursing 4th year	45	14.06%	
For how long you are taking online classes?	Less than 6 months	97	30.3%	Significant
	More than 6 months	31	9.7%	
	1 year	85	26.6%	
	2 year	107	33.4%	
Do you wear eyeglasses before taking online classes?	Yes	141	44.1%	Not significant
	No	163	50.9%	
	Maybe	61	5%	
How much hours you spend every day in online classes?	0 hour	25	7.8%	Significant
	1 hour	16	5%	
	2 hours	24	7.5%	
	3 hours	39	12.1%	
	4 hours	66	20.6%	
	5 hours	43	13.4%	
	6 hours	48	15%	
	7 hours	22	6.8%	
	8 hours	23	7.18%	
	9 hours	7	2.1%	
	10 hours	6	1.8%	
Which gadget do you use for taking online classes?	Smart phone	265	82.8%	Significant
	Laptop	13	4.06%	
	Both smartphone & laptop	38	11.9%	
	Tablet	4	1.25%	
	TV Screen	0	0%	
	Personal Computer	0	0%	
Other than classes for how long you take online classes?	Less than 3 hours	193	60.31%	Not significant
	More than 3 hours	127	39.68%	

year. All were taking online classes for more than six months, with 9.37% taking for more than six months, 30.31% taking for more than six months, 33.43% taking for a year, and 26.56% taking for last two years. 44% of all respondents were wearing glasses while taking online classes. The most common digital device used was the smartphone, $n=265(82.81\%)$ for online classes. Other than online classes, most students ($n = 193, 60.31\%$) used electronic devices for less than 3 hours. The eye health of the students was significantly associated with their knowledge of type of gadget that should be used for good eye health. Practice of the students found to be significantly correlated with duration of hours spend every day in online classes. **Knowledge Assessment:** To assess the knowledge level among student nurses 10 questions were asked by pre-validated knowledge questionnaire. Mean and standard deviation of the knowledge score was 11.43 ± 2.36 . Analysis of central tendency showed that median is 12 mode is 10 with a range of 5-19. The positive responses to the knowledge question had significant variations and varied from the lowest 11%, for the question "For how many times eye exercise should be performed?" to the highest 89.7%, i.e., "Do you know that online classes affect eye health?" Among all the respondents, 89.7% said that diet can improve eye health, 84.4% of students said that regular eye exercise can improve eye health, 74.1% knew about myopia, 71.3%

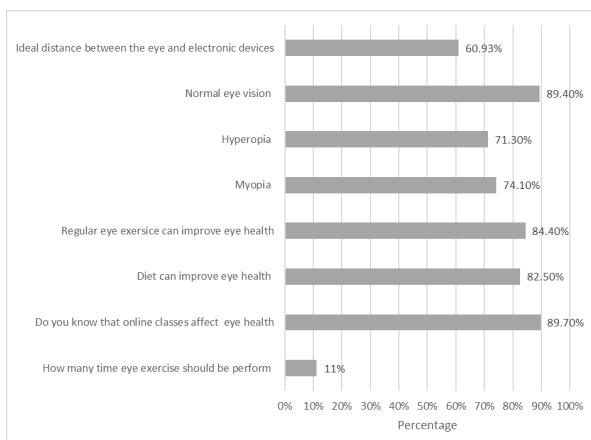


Fig. 1: Percentage of knowledge level regarding eye health among student nurses.

knew about hyperopia, 89.4% knew that 6/6 is normal eye vision, and 60.93% knew that the ideal distance between the eye and electronic devices is 20–28 inches[Figure 1].

Knowledge about eye health during online classes were analysed in to good, fair and poor knowledge score category. 16.25% of student nurses were categorized as having poor knowledge, 5.31 percent as having good knowledge, and 76.2% as having fair knowledge. There was a significant relationship in chi-square ($21.97 p < 0.05$) analysis for Eye health knowledge and type of gadgets used by student Nurses. **Practice Assessment:** Practice assessment was done by questionnaire of 10 practice related questions through google form. Mean and standard deviation of the practise was 4.42 ± 1.53 . Analysis of central tendency for practiced score showed that. Median value was 4 and mode was 9. Out of total 320 students, 54.5% of students were maintaining the proper distance, i.e., 20–28 inches between their eyes and electronic devices (Figure 2). 36.7% of students were taking vitamin supplements to improve their eye health. 89% of students take small breaks between online classes. 31.7% were using blue light glasses and 31.1% were wearing antiglare glasses to prevent radiation emitted from electronic devices (Figure 3)

While taking online classes, 24.1% of students practised washing their eyes after every 1 or 2 classes (Figure 4).

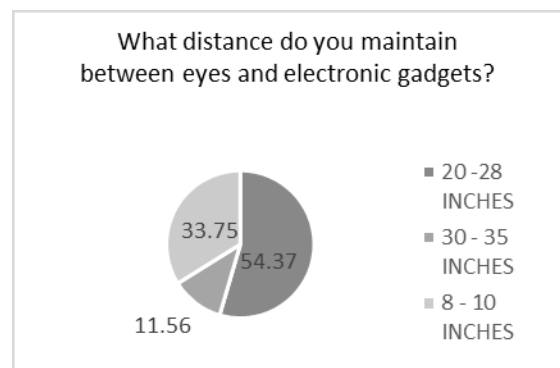


Fig. 2: Distance maintained by student nurses between eyes and electronic gadgets.

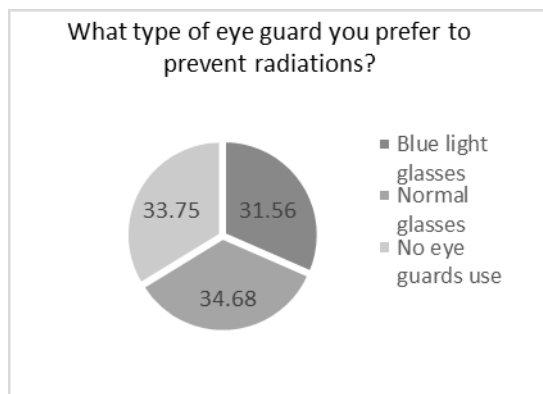


Fig. 3: Type of eye guard used by student nurses to protect their eyes from radiations

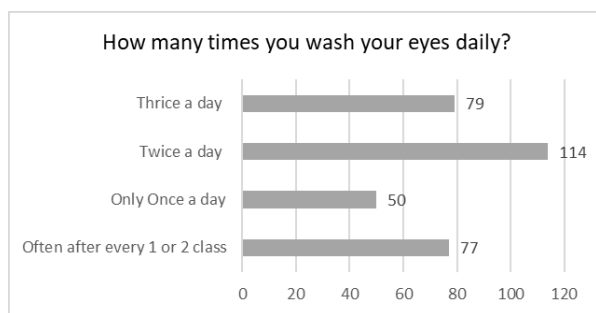


Fig. 4: How many times do student nurses wash their eyes daily.

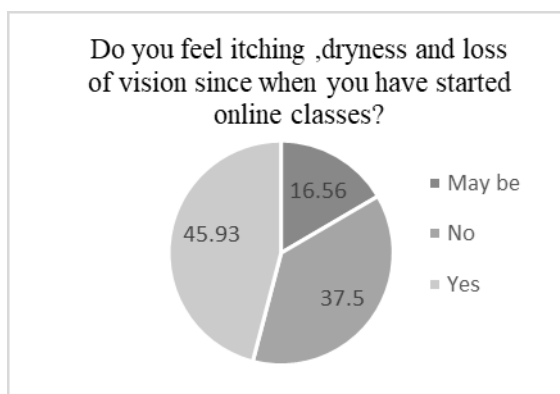


Fig. 5: Percentage of student nurses with symptoms of digital eye syndrome

While taking online classes, 46.5% of students feel itching, dryness, and loss of vision since starting online classes (Figure 5).

Taking online classes daily means student must get proper sleep, 71.8% of students were taking 6-8 hours of sleep, 15% were taking less than 6 hours, and 13.20% were taking more than 8 hours of sleep (Figure 6)

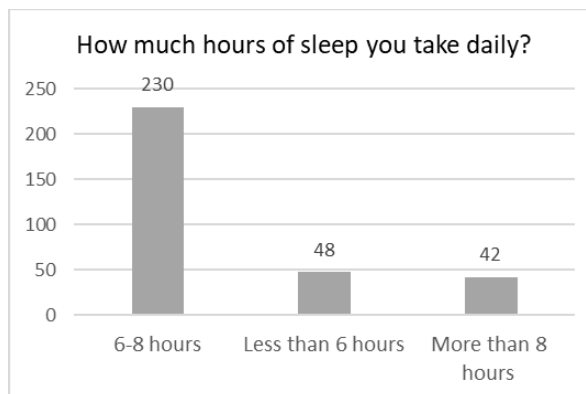


Fig. 6: Student nurses and their sleeping pattern during online learning.

Eye health practise is significantly associated with duration of online classes" ($p < 0.05$) As a result of this study's population characteristics, out of an estimated 320 student nurses, the majority (79.68 percent) were in the 18-21-year-old age range and were female students (64.4 percent) (42.18 percent). For the past two years, 33.4 percent of nurses have taken regular online classes, and many student nurses (20.6 percent) have spent close to 4 hours of online learning. Fifty-nine percent of these students do not wear eyeglasses while taking online classes, and 82.6 percent of them use their mobile phones for study purposes as well. Except for those taking online classes, 60.31 percent of student nurses said they spent more than three hours a day on their phones while studying for clinical rotation.

DISCUSSION:

The study aimed to find the level of knowledge and practices among Nursing students regarding eye care during online classes in the present study it was found that calculated mean difference between knowledge and practice is 7.03 which indicate a gap between student nurses 'knowledge and practice regarding eye care while attending online cases similar study was published in 2021 by Amit Mohan et al [22]. indicated that the prevalence of digital eye syndrome (DES) was greater among those youngsters who were learning online for more than five hours and the authors suggested that parent should take care of eye health by choosing appropriate

device, maintain appropriate distance and time while using digital devices, In the present study also a correlation was observed between an individual's online learning expertise and the equipment and gadgets they used, such as smart phones and laptops. 54.5% Students who took online classes were Practicing 20 to 28 inches away from their electronic devices, and 36.7 percent of them were taking vitamin supplements to improve their eye health. Only 24.1 per cent of students practised washing their eyes after every one or two classes, and many of the students took small breaks between online classes, 89 percent. Only 31.1 percent were using antiglare Glasses while attending online classes where as it is highly recommended by a study conducted by Smita Agarwal et al^[23] that it is a potential risk factors for ocular problems.

LIMITATION

There are some limitations in the study. This study has explored only 320 student nurses which seems to be a small sample to generalise the result for prevention of eye problem during online learning in the whole population. Ophthalmic examination was not done to confirm effect of such practices.

CONCLUSION

There is gap between knowledge and practice of student nurses related to eye health literacy during online classes which need to be filled by education program and motivation classes.

Conflict of interest nil

Source of funding: no funding is taken to conduct this study.

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Evaluation of Pregnant Women's Barriers to Physical Exercise During Pregnancy at Maternity Hospitals

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ABSTRACT

Background: There are major health benefits of physical exercise during pregnancy for the mother and newborn. On the other hand, physical inactivity during pregnancy is varied around the world, but it is more common during the third trimester of pregnancy. A positive attitude toward antenatal exercise can reduce physical inactivity.

Objectives: To identify the barriers that prevent pregnant women from doing physical exercise. To find out the association between the barriers and pregnant women's characteristics.

Methods: A descriptive cross-sectional study design was used to assess pregnant women's barriers to physical exercise during pregnancy. Non probability (purposive sample) was used to collect the data from (200) pregnant women. The questionnaire consisted of ten questions for barriers and ten questions for practices.

Results: The higher percentage of women's age was (20-29) years; they graduated from primary school. More than one-third of them have two to three living children. Most of them stated a lack of information or training on physical exercise during pregnancy is the most common barrier, and only (37%) pregnant women practice antenatal exercise.

Conclusion: The perceived barriers to physical exercise during pregnancy are a lack of information or training, a lack of family support, a lack of time, and the fear that it may be harmful to the fetus. Pregnant women need encouragement to perform prenatal exercise and facilitate the overcoming barriers.

Keywords: *Pregnant, Knowledge, Attitude, Physical Exercise, Pregnancy*

INTRODUCTION

Pregnancy is a life-changing experience that can affect women's physical activity¹. Physical activity a crucial aspect of a healthy lifestyle, and has benefits for women's health. Physical exercise as a type of physical activity is a planned, regulated, and repetitive body movement that requires either physical or mental effort and is done to promote health and maintain physical fitness^{2,3}.

Excessive weight gain during pregnancy is considered one of the major growing concerns among pregnant worldwide and is associated with maternal and fetal complications such as gestational diabetes⁴. On the other hand, physical exercise during pregnancy decreases gestational diabetes, premature birth, weight gain, and the risk of preeclampsia, enhances pain tolerance, improves mental health, and improves sleep, according to growing research. It also prevents postpartum depression.

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It enhances the likelihood of vaginal birth, and lowers the chance of cesarean birth⁵⁻⁷.

Lifestyle changes have been demonstrated to lower the risk of pre-eclampsia, preterm delivery, and intrauterine demise according to a meta-analysis of (7278) participants from (44) studies⁸.

Pregnant women should get at least 150 minutes of moderate-intensity physical activity per week, according to the American College of Obstetrics and Gynecology. So, regular physical exercise is suggested for all pregnant women, regardless of whether they were active or inactive before pregnancy⁹.

Pregnant women's barriers, facilitators, and attitudes must first understand from health care providers in order to efficiently target education and evidence-based behavior modification techniques in physical exercise¹⁰.

Therefore, this study aims to assess barriers to antenatal exercise among pregnant women to provide data that would be potentially useful in generating previously unavailable data on antenatal exercise during pregnancy among Iraqi women, which may serve as a baseline for future studies or public health interventions of appropriate planning to improve maternal and fetal wellbeing.

SUBJECTS AND METHODS

A descriptive cross-sectional study design was used to assess pregnant women's barriers to physical exercise during pregnancy at outpatient maternity hospitals in Baghdad city. The study was conducted from October 2021 to November 2022. Non probability (purposive sample) was used to collect the data from (200) pregnant women. Inclusion criteria (Singleton pregnancy, gestational age of (28 to 32) weeks, and hasn't had any medical or obstetrical complications). The questionnaire consisted of socio-demographic characteristics, reproductive characteristics, ten questions for barriers, and ten questions for practices. For barriers items with categorical responses (yes, no) were given an item score of '2', '1', respectively. For practices, "yes" or

"no" responses were assigned item scores of "2" or "1," respectively. A pilot study was conducted in order to determine the reliability of the questionnaire in a sample of (20) women ($r1= 0.85$). The data was collected after obtaining the women's consent to participate in this study. Data are analyzed through the use of SPSS version 26.

RESULTS:

This table 1 shows that more than half (56.5%) of women's ages are between (20 and 29)

Table 1: Distribution of Study Sample According to Socio-demographic Characteristics

Demographic Characteristics	F	%
Age / years		
< 20	38	19
20-29	113	56.5
30-39	46	23
≥ 40	3	1.5
Total	200	100
Mean=25.73 SD=5.6		
Educational level		
Read & write	27	13.5
Primary School	60	30
Preparatory School	49	24.5
Secondary School	27	13.5
Institute graduate	5	2.5
College graduate	27	13.5
Master and higher	5	2.5
Total	200	100
Occupational Status		
Student	26	13
Employee	24	12
Housewife	150	75
Total	200	100
Income		
Sufficient	32	16
Somewhat sufficient	82	41
Insufficient	86	43
Total	200	100
Family Type		
Nuclear	77	38.5
Extended	123	61.5
Total	200	100

years, with a mean (SD) 25.73 (5.6). Regarding educational level, about one-third of them (30%) are graduates of primary school. Regarding occupation, the majority of them (75%) are housewives.

This table 2 shows that a higher percentage of pregnant women (54%) have planned pregnancy. About two-thirds of them (62%) are in the third trimester of gestation. Regarding the number of living children, about one-third of them (39%) have (2-3) children. A higher percentage of them (54%) have had previous deliveries through vaginal birth.

Table (2) Distribution of Study Sample According to Reproductive Characteristics

Variables	F	%
Planned pregnancy		
Yes	108	54
No	92	46
Total	200	100
Gestational Age/ weeks		
1 st trimester	24	12
2 nd trimester	52	26
3 rd trimester	124	62
Total	200	100
Mean (SD) 28.9 (10.3)		
Living children		
0	58	29
1	33	16.5
2-3	78	39
≤4	31	15.5
Total	200	100
Abortion		
0	163	81.5
1	20	10
2-3	12	6
≤4	5	2.5
Total	200	100
Previous Delivery		
Cesarean birth	92	46
Vaginal birth	108	54
Total	200	100

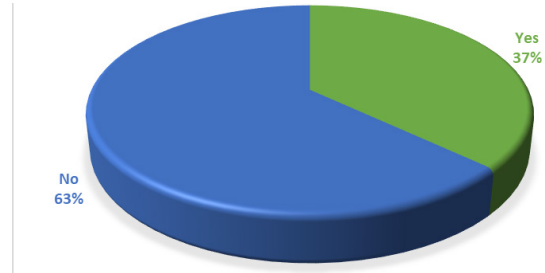


Fig. 1: Women Practices of Physical Exercise During Pregnancy

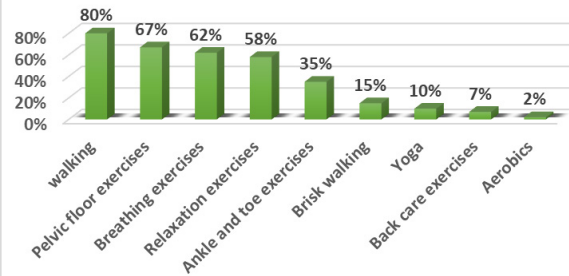


Fig.2: Physical Exercise During Pregnancy

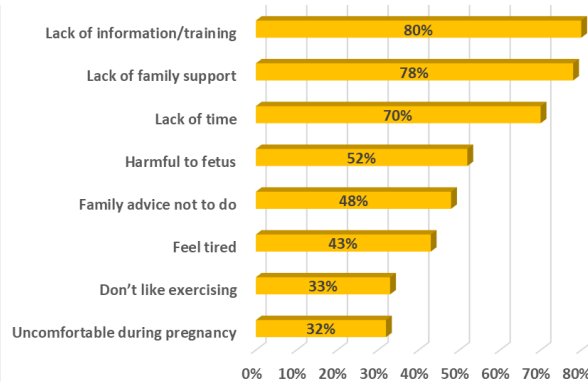


Fig. 3: Women’s Barriers Toward Physical Exercise During Pregnancy

DISCUSSION

This study included (200) pregnant women attending outpatient maternity hospitals. The main findings were that most of them (63%) stated they did not perform physical exercise during pregnancy. Antenatal exercise is essential to prevent excessive weight gain or the onset of gestational diabetes mellitus, one must lead a healthy lifestyle that combines exercise and diet. In general, women during pregnancy seem to be more receptive to advice and information since they are excited about making changes that will benefit the

fetus. But the majority of them don't exercise enough, according to reality⁸.

The current study identified the barriers to physical exercise during pregnancy among pregnant women; the majority of them stated that a lack of information or training (80%), a lack of family support (78%), a lack of time (70%), more than half of them were afraid that it may be harmful to the fetus (52%), family members advice not to do it (48%), they felt tired (43%), about one-third of them didn't like exercising (33%), and they felt uncomfortable (32%).

Al Youbi and Elsaid (2020) found that among (442) women attending antenatal care assessed for barriers to physical exercise, most of the study participants felt tired (84.4%). The second barrier includes no access to facilities for (45.9%) of them. Also, some of them reported transportation problems (24.2%), a lack of time (24.7%), more than two-thirds reported no time (65.14%), and not knowing the importance (20.4%)⁴.

Physical exercise adherence during pregnancy is affected by a variety of variables Fatigue, pregnancy symptoms, discomfort, lack of strength, lack of time, lack of motivation, lack of social support, and concern about the safety of physical activity for the baby and the mother are the most commonly mentioned barriers to physical activity during pregnancy¹¹.

Aslam et al., (2021) found that barriers that prevent pregnant women from doing physical activities include leg cramps, backache, fatigue, and epigastric discomfort¹².

A healthy expectant mother can perform physical exercise since doing it at the recommended level gives pregnant women plenty of energy throughout pregnancy and can help prevent backache and cardiovascular disease. Exercise during pregnancy can improve bodily function and lower psychological stress, both of which are advantageous, especially during labor and the puerperium¹³.

Kianfard et al. conducted a qualitative study to identify the facilitators and barriers

that influence physical activity among (40) pregnant women. They found that the most significant barriers include lack of awareness, inaccurate information, accessibility difficulties, and financial issues. On the other hand, the best facilitators of physical exercise during pregnancy include physicians' recommendations and being among other pregnant women¹⁴.

The current study sample perform physical exercise during pregnancy were only (37%), but the majority of them performed walking (80%), about two-thirds pelvic floor exercises (67%), breathing exercises (62%), and more than half relaxation exercises (58%). A study conducted among (205) pregnant women attending the antenatal clinics at Maternity & Children's Hospital in Jeddah, Saudi Arabia, to assess the prevalence and barriers to physical activity among pregnant women found that only (40% to 46%) maintain an average daily physical activity, and the higher percentage of barriers to exercise are lack of energy, fatigue, or drowsiness (70.2%), lack of medical advice about exercise during pregnancy (69%), inconvenient weather (62.3%), and breathlessness (59%)¹⁵. This result is inconsistent with a study conducted in Pakistan among (186) participants who stated that walking, (5.9%) relaxation, (7.0 %) breathing, and only (4.3%) aerobics^[16].

Okafor and Goon (2022) conducted a mixed-methods study to assess the barriers to prenatal physical activity among (1082) pregnant women in the Eastern Cape Province, South Africa, they found tiredness, lack of time, discomfort, low energy, lack of support, lack of advice, and lack of information about prenatal physical activity are the most common barriers among their study sample¹⁷.

Sytsma and colleagues (2018) compared the barriers for pregnant women performing exercise and not performing the exercise, They reported that among (549) pregnant women in the first trimester, the greatest barriers (mean) were nausea/fatigue (3.0) and lack of time (2.6). Exercisers reported significantly lower barrier levels. On the other hand, nausea

and fatigue were greater barriers for non-exercisers compared to exercisers (3.6 vs. 2.8, $p < .001$)¹⁸.

A mixed method study was conducted among (50 pregnant women and 34 providers) to collect qualitative data by interviews, and (88 pregnant women and 64 providers) to collect quantitative data by questionnaires in Mexico. They found the most common barriers to physical exercise during pregnancy include a lack of time, a lack of social support, a lack of instructors, and a lack of a safe and adequate physical environment)¹⁹.

A previous study demonstrated many potential health benefits of aerobic and strength-conditioning exercise for pregnant women and postpartum women. It is considered safe, and even advisable. Unfortunately, among this study sample, the lowest percentage of physical exercise was aerobic, and only (2%) of pregnant women performed it, because of a lack of awareness, encouragement, and fear of fetal harm ^[20].

Healthcare team, particularly nurses, have regular contact with expectant women, they play a critical role in encouraging prenatal exercise. A review of nurse midwives in the United States on their usage of prenatal exercise counselling discovered that (65%) of respondents offered tailored antenatal exercise counselling. A research of 24 pregnant women in Pennsylvania indicated that health advice on exercise and prenatal weight gain was minimal, sometimes insufficient, and hence unlikely to inspire them to engage in physical activity. Another research of community nurses and pharmacists discovered that they often advised pregnant women on diet and physical exercise. As a result, continuing education is important to guarantee that healthcare personnel have the necessary information²¹.

CONCLUSION

The present study concluded that the perceived barriers to physical exercise during pregnancy among pregnant women are a lack

of information or training, a lack of family support, a lack of time, and the fear that it may be harmful to the fetus. Therefore, only about one-third of women practice physical exercise during pregnancy.

Recommendation

Pregnant women need education from their health care provider regarding antenatal exercise to encourage them to perform prenatal exercise and facilitate the barriers. Other studies need to identify the facilitators of physical exercise during pregnancy.

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