Exploring the Effect of Problem Based Facilitatory Teaching Approach on Motivation to Learn: A Quasi-Experimental Study of Nursing Students in Tanzania

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Research article

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Abstract

Background: Currently, there has been a progressive shortage of not only the number of frontline healthcare providers but also a decline in the quality of nursing care. Reports about unethical and illegal practices, under standard care and malpractices, are not uncommon around the globe. There is a growing concern to rethink the approaches on how nurses are prepared, explore, and test novel approaches for delivering the nursing curricula. This study tested the effect of the Problem Based Facilitatory Teaching Approach on motivation to learn among nursing students in Tanzania, higher learning institutions.

Methods: A pre-post test controlled quasi-experimental study of purposively selected 401 participants was conducted between February and June 2018. The Auditing Inventory developed by the researcher measured the intervention and Questionnaire titled “Motivation to Learn Strategies in Nursing”, was adopted to measure the motivation to learn, respectively. Statistical Product for Service Solutions software program version 23 was used to perform analysis. A descriptive analysis was performed to analyze sociodemographic. Regression analysis was performed to determine the association between variables. This study was not a clinical randomized controlled trial and thus it has not been identified in the title and no summary of trial design, methods, results, and conclusion.

Results: Findings revealed that 65.8% of the study participants were males. The post-test findings revealed that 70.3% of the study participants demonstrated motivation to learn contrary to 34.9% at baseline. Participants in an intervention group were 1.720 (AOR) times more likely to develop motivation to learn than the control group (p<0.05; 95%CI: 1.122, 2.635). In contrast, the intervention was less times likely to enhance Extrinsic motivation to learn (AOR = 0.676, p>0.05, 95%CI: 0.405, 1.129) and Amotivation (AOR = 0.538, p>0.05; 95%CI: 0.283, 1.022) in learning among nursing students respectively.

Conclusion: Problem-based facilitatory pedagogy had positive effect on motivation to learn including intrinsic motivation than conventional teaching pedagogy. Thus, the approach has educational potentials to positively change the spectrum of nursing competency and quality of care. Thus, the move to adopt a problem-based facilitatory teaching pedagogy among nursing training institutions in Tanzania is worth considering and needs to be continued.

Background

Globally there is a critical shortage of nurses despite increasing health needs and demands for an expanded role of the nursing profession in the delivery of complete health care (1). Across the entire spectrum of care needs and patient role experiences, there is a high demand for competent professional care and support from the Nurses.

 Currently, nursing professionals make almost 50% of the health workforce worldwide. Of the 43.5 million Healthcare Workers, 20.7 million (50%) are nurses and midwives (2). Global projection of the shortage of nurses and midwives by 2030 is in a moderate decline by 7.6 million for the developed countries whereas trends show a worsening situation for the African and Eastern Mediterranean regions if the current trend
continues (2). According to the human resource for health strategic plan 2008-2013 report by the Ministry of Health and Social well-being (3), the shortage for nurses in Tanzania ranged from 65% in public health facilities and 86% in private health facilities indicating that Tanzania's health system faces a shortage of nurses, which requires urgent measures.

On the other hand, increased burden of new diseases, increased population aged over 60 years, advances in science and technology, increased patient autonomy, and demands for quality and affordable care; all call for new thinking towards nursing as a profession, its body of knowledge, learning pedagogy and scope of practice (2,4,5). Corresponding to the complexity of the nursing body of knowledge and the expanding roles that graduate nurses are expected to carry, today the nursing curriculum is highly loaded with both robust content and rich practical experiences (6). The curriculum aims to ensure that nursing graduates are highly motivated to learn and for them to have higher levels in cognition. (7,8).

Recent changes in nursing education have led to the desire to provide meaningful teaching and active learning, which motivate students to learn with minimal support from instructors. Motivation to learn is a measure of nursing competence, which indicates that professional nurses are prepared to resolve nursing problems in rapidly changing environment (9).

Carroll (10) described academic motivation and academic achievements to be two significant factors in the analysis of academic performance for students. It refers to a student’s inner desire that guides behavior towards learning and academic achievements influenced by both, internal and external factors. Motivation plays a major role in explaining behaviors, predicting the effects of actions, and guiding behavior to achieve objectives. It does not only promote learning but also an intermediate impact on learning which helps students to have smooth relationships, decrease stress, increase creativity, and promote open learning (11). Various scholars refer an academic motivation as the required stimulation to do the assignments, to achieve the goals, or to acquire a certain degree of competence in one’s work and consequently gain academic achievements (12–14). It is a key factor in a student’s academic performance in a problem-based environment. It can be classified as intrinsic motivation (to know), intrinsic motivation (toward accomplishment), intrinsic motivation (to experience motivation), extrinsic motivation (Identified), extrinsic motivation (Introjected), extrinsic motivation (External regulation), and Amotivation.

Motivating nursing students to learn is an essential component to ensure competent graduates who can exhibit safe, ethical, and legal practice and is a critical issue in the nursing education field (12,14,15). Duiker (9) found out student’s motivation in education is often driven by two questions “Can I do this task?” (Beliefs on one’s capabilities, belief about factors which cause success, and belief about one’s low influence on success) moreover, “Why am I doing this task?” (Task values-interestingness, importance, utility, goal orientation).

The curricula in nursing institutions are challenged to motivate nursing students to acquire appropriate skills that will allow them to offer high-quality care to patients/clients (16). Challenges are still on enhancing student’s intrinsic motivation (to know), intrinsic motivation (toward accomplishment), and
intrinsic motivation (to experience motivation) rather than extrinsic motivation (Identified), extrinsic motivation (Introjected), extrinsic motivation (External regulation) and decrease Amotivation.

Tanzania is among Sub-Saharan African countries, which has adopted competency-based curricula. However, no evidence shows how Health Science Colleges/Universities have changed to cater to new demands (3). Tutors and lecturers, still focus on developing course contents along with traditional instructional-based pedagogies with the hope that learners will be motivated and automatically develop the intended knowledge and skills (17).

Educators find themselves utilize instructional teaching methods (traditional) more often because it is cheap, easy to implement, can cover an extensive course content at once, and suitable for a large group of students (18). Likewise, students are trained in such a way they associate teaching and learning as the process, which involves preparing for a test or earning a grade (19). However, competency-based curricula aligned with facilitation in the problem-based environment (FPBE), has been seen to be a robust educational solution (20). PBL is a teaching pedagogy that uses real-world problems as the motivator of student’s self-directed learning process (21).

iPBL has an emphasis is on academic motivation and knowledge construction rather than knowledge transmission. It motivates and makes students be a source of knowledge and skills. They can build up new knowledge from their existing one (zonal of proximal development) while scaffolding being the support to help them achieve their significant developmental potentials (22).

Students are given opportunities to explore, investigate, analyze, synthesize, and carry out experiments and eventually reach their conclusions. The instructor’s roles are just to facilitate, direct, guide, and assist students to be motivated to learn. The instructor poses questions to the entire class and students in teams work together to discuss and reach an agreement on their answers, which then they share in the class (23,24).

What is lacking; is understanding to what extent can new teaching methods like FPBE pedagogy be an alternative and effective teaching pedagogy in improving learning motivation to nursing students in resolving patients' health problems (20). Locally nursing scholarly literature is scarce, on the subject in Tanzania. Likewise, little has been done to demonstrate the means through which Tanzanian nursing training institutions are actively implementing new instruction pedagogies (3).

The current study aimed at determining the effect of FPBE teaching pedagogy on motivation to learn among undergraduate nursing students in higher Tanzanian training institutions. It was guided by specific objectives including determining the effect of FPBE pedagogy on the level of intrinsic motivation, extrinsic motivation, and Amotivation to learn among undergraduate nursing students in higher learning institutions within Dodoma city. The null hypothesis was used to determine the effect of the independent variable over the outcome variable, which stated: “there was no significant difference in the levels of motivation to learn between nursing students under FPBE and their counterparts in the NFPBE in a higher learning institution, Tanzania.”
Methods

Study Design and Approach

The study was a pre-post controlled quasi-experimental with cluster-randomized educational institutions (to either be in an intervention or control group) through a simple random sampling technique by lottery method determined by the research assistants. The first pick of papers from an allocation choice box was assigned to an intervention and the second to the control group. The study participants were purposively selected 401 (interventional group = 134 and control group = 267) by the researcher and research assistants.

The participants were undergraduate nursing students from selected government and private-owned higher learning institutions in Tanzania. The quantitative research approach was employed to determine the extent the intervention could improve levels of motivation to learn among nursing students.

The study included undergraduate nursing students, who had a regular attendance of classes, and those who gave a written informed consent (willingness to join the study). Matching of the study participants by their social demographic and academic characteristics was also done to ensure the similarities.

The sample size was determined by using the findings of Shahin et al., (25), who did a study on critical thinking and self-directed learning as an outcome of facilitation in a problem-based environment among nursing students. A WinPepi Software program (sample size calculator) version 11.65 was used to calculate the minimum sample for this study. Effect size (d = 4.5) of demonstrating a statistically significant difference between mean values of the before and after the intervention, was set at a 95% confidence interval. A significance level was set at 5% (p<0.05) with the power of 80%. The ratio of sample size was B: A =1:2 with 134 participants in the intervention and 267 participants in the control group (n = 401)

Study Location

The study was done between February and June 2018 in the two major Universities within Dodoma administrative region and currently the Capital city, Central zone of Tanzania. The pre-post written test was used to collect and compare data before and after an intervention. The interventional group learned the prepared research content by using FPBE pedagogy whereas their counterpart (control group) learned by using the conventional-based instructional method.

Data Collection Process

The researcher and research assistants distributed copies of questionnaires among the study participants. All participants answered the same questions before and after an intervention.

Data Collection Tools
The instrument used for data collection was a structured Questionnaire titled Academic Motivation Scale (AMS-HS 28): adapted from AMS – College Version 1993 and validated by Haugan et al., (26). The tool was used for assessing levels of intrinsic motivation (towards knowledge, accomplishments, and stimulation), extrinsic (introjected and identified regulation), and amotivation among undergraduate nursing students. It had 28 items with 140 scores on a 5-point point Likert scale. Scale 1 = does not correspond at all, 2 = correspond a little, 3 = corresponds moderately, 4 = corresponds a lot and 5 = corresponds exactly. Part A of the instrument elicited information about demographic data (e.g. age, sex, education level of the student, accommodation status, etc.). Part B elicited information about levels of motivation to learn adopted by students in their learning processes. This part covered three aspects (Intrinsic motivation, extrinsic motivation, and Amotivation to learn).

Intrinsic motivation was assessed by using a twelve (12) 5-point Likert (≥6 scores were defined as intrinsically motivated) scale items, extrinsic motivation twelve (12) items (≥6 scores were defined as extrinsically motivated), and Amotivation to learn 4 items (≥2 scores were defined as intrinsically motivated). The overall motivation to learn among the study participants was then computed that had a cut-off point in this study was set at 70 scores from 140 total scores of the scale items. The study participant, who scored ≥70 of the scale items, was defined as motivated to learn otherwise not.

**Development and Classroom Tryouts of the Research Teaching Material**

As shown in figure 1, the designed material was prototyped into phase 0, I, II, and III. Phase 0 was the development phase while phases 1 and 2 were for classroom tryouts. The third version was subjected to the field-testing. Classroom tryouts for phases 1 and 2 were done in one sampled health training institution, which was different from health training institutions where the study was conducted. All classroom tryouts involved 10 nurse students, a principal researcher, 2 research assistants, 1 curriculum development expert, 1 over five years experienced nurse tutor in teaching leadership and management content. Experts and student's opinions of one classroom tryout led to the development and refinement of the next version. The evaluation process of the developed research teaching material was done formative and summative basing on the experts’ and students’ opinions. All observations from experts and students were only used to assure the acceptability, feasibility, and practicality of the research teaching and learning material before actual field implementation.

**Facilitation in a Problem-Based Environment Sessions (Intervention)**

This part served as an actual implementation phase, which involved the followings;

**Introduction and Group Formulation:** this part was covered on the first day of the study. The researcher introduced the FPBE process and shared the expected terminal behavior throughout the FPBE classes. Students were then randomly assigned to the learning groups (8 students) per each whereby they were asked to appoint a leader and record keeper between himself and herself. This part took approximately 30 minutes.
Problem Presentation, Solving, and Discussions: the researcher and research assistant reviewed the objective of each session. Each group was asked to seat in the round so that they could maintain eye contact and facilitate the easy flow of discussions. Thereafter, each group was given the developed scenario on Conflict Resolution at the working place and allows the students to start addressing it. Participants were guided and facilitated by the researcher and research assistants to solve the problem, listing what they knew, what they did not know, what they needed to know and establish the issues to learn.

Students were guided to clarify, rank, and assign learning tasks to each member of the group. They were then guided to identify and suggest the reasoned available resources needed to solve the presented problem and continue solving it. This part took approximately 60 to 120 minutes based on the institution schedules. Then, students were given one week to address the problem until the next scheduled time because there would always-learning issues to be explored about the problem. As part of the closure, the researcher and research assistants required either students to communicate by mobile texts, orally, or writings through email whenever they need any help or clarifications. In the next meeting, presentations of the solved problems were done per each followed by discussions and sharing of real-world scenarios, which reflected their experiences in real life. Misconceptions and other myths got a chance to be cleared.

Group Facilitations: this study used two forms of facilitating the groups including researcher and research assistant facilitation and group leaders’ facilitation. Group leaders were sometimes used to facilitate groups because the classes were so large. They were briefly instructed to act as facilitators on how to monitor and control the learning process in their groups.

Assessments: after completing the intervention classroom sessions, the researcher, assistant researchers and students, evaluated the lesson objectives by providing inputs, students learning behaviors, advantages and disadvantages of group interactions, and the benefits of learning through FPBE. Peer assessment was the main method used to assess the learning process among participants. The posttest to assess end line levels of motivation to learn was then administered to the participated students to ascertain the effect of the intervention.

Data Analysis

Descriptive and Inferential statistical analyses were performed in this study. All the statistical analysis was performed using the Statistical Product for Service Solutions (SPSS) version 23. Descriptive statistics by the means of chi-square and cross-tabulation statistical tests were performed to determine the relationship between categorical variables and findings were presented in frequencies, percentages, mean scores, and standard deviation (SD). Paired-sample and independent samples t-tests were performed to compare the differences of the mean scores among the study participants within and between groups whereby the mean (M), standard deviation (SD), and p-value were used to present the findings in tables. Inferential statistical analyses were performed through regression analysis to determine the association between variables. The findings were presented by odds ratio (OR), adjusted odds ratio (AOR) and p-value that was set at \( \leq 0.05 \) to be statistically significant.
Results

Demographic characteristics of the study participants

Table 1 shows the distributions of the study participants’ gender, age, marital status, and accommodation status. It was observed that 65.8% of the participants were males and 34.2% females. Study participants (73.6%) aged between 25 to 29 years and it was a dominating age group in this study. In addition to that, 92.5% of them were singles against those who were married. 69.3% of the participants lived on campus. No statistically significant difference in their gender, age, and marital status distributions between groups (p>0.05). A significant difference was observed in the accommodation status of the participants between the two groups (p<0.01).

Table 1: Distribution of participants characteristics between Intervention and Control group (n = 401)

| VARIABLE            | Intervention | Control | P-value |
|---------------------|--------------|---------|---------|
| Gender              |              |         |         |
| Males               | 83           | 181     | 0.244   |
| Females             | 51           | 86      |         |
| Age                 |              |         |         |
| < 24 yrs.           | 6            | 25      | 0.192   |
| 25-29 yrs.          | 100          | 195     |         |
| > 30 yrs.           | 28           | 47      |         |
| Marital status      |              |         |         |
| Single              | 123          | 248     | 0.695   |
| Married             | 11           | 19      |         |
| In campus           |              |         |         |
| Yes                 | 43           | 235     | 0.001   |
| No                  | 91           | 32      |         |

Source: Field Data (2019)

Other important participants’ characteristics (interest, reasons, satisfaction, learning benefits, and learning difficulties), which could influence motivation to learn

As shown in Table 2, 73.8% of the participants were interested in the nursing profession and its programs while 52.4% of them had chosen the nursing profession, as their first “own choice” and 20.9% due to parent’s/peer pressure. Moreover, 75.3% of the participants were satisfied with nursing courses being
taught to them whereas, 84.0% of them agreed that the teaching and learning practices were of a benefit to their learning processes. However, 30.7% of the participants reported experiencing some difficulties in comprehending course contents due to its complexity, limited time (25.9%), and difficulties in accessing learning materials (20.0%). Some findings differed between groups as it is shown in the table.

Table 2: Distributions of participants’ factors between Intervention and Control group (n = 401)

| VARIABLE                      | Intervention | Control | Chi-square test |
|-------------------------------|--------------|---------|-----------------|
|                               | N  | %   | N   | %   | Value | df  | P-value |
| Interest                      |    |     |     |     |       |     |         |
| Yes                           | 92 | 68.7| 204 | 76.4| 2.771a| 1   | 0.096   |
| No                            | 42 | 31.3| 63  | 23.6|        |     |         |
| Reasons to choose nurse       |    |     |     |     |       |     |         |
| Own choice                    | 71 | 53.0| 139 | 52.1|        |     |         |
| Parent’s/peer pressure        | 29 | 21.6| 55  | 20.6|        |     |         |
| Easier to get a job           | 24 | 17.9| 48  | 18.0| 0.430a| 3   | 0.934   |
| Entry qualifications          | 10 | 7.5 | 25  | 9.4 |        |     |         |
| Satisfaction                  |    |     |     |     |       |     |         |
| Yes                           | 78 | 58.2| 224 | 83.9| 31.60a| 1   | 0.001   |
| No                            | 56 | 41.8| 43  | 16.1|        |     |         |
| Learning benefits             |    |     |     |     |       |     |         |
| Agreed                        | 104| 77.6| 233 | 87.3| 6.200a| 1   | 0.013   |
| Disagreed                     | 30 | 22.4| 34  | 12.7|        |     |         |
| Learning difficulties         |    |     |     |     |       |     |         |
| Difficult accessing updated learning materials | 24 | 17.9 | 56 | 21.0 |
| Complex course contents       | 49 | 36.6 | 74 | 27.7 |
| Inadequate support from lecturers | 18 | 13.4 | 37 | 13.9 |
| Limited time                  | 25 | 18.7 | 79 | 29.6 |
| No conducive environment      | 18 | 13.4 | 21 | 7.9  |

Source: Field Data (2019)
Overall Levels of Motivation to Learn among Nursing Students

Findings of the levels of motivation to learn among nursing students were presented based on the overall motivation and its domains including intrinsic motivation (knowing what to learn, an accomplishment of learning tasks, and experiencing stimulation to learn), extrinsic motivation (identification of what to learn, introjection to learn, and regulation of motivation to learn) and amotivation.

**Overall Levels of Motivation to Learn and its Subscales among Nursing Students**

Table 3 indicates that 70.3% (n = 282) of the study participants demonstrated motivation to learn post-intervention contrary to 34.9% (n = 140) at baseline. Additionally, there was a significant gain of motivation to learn among nursing students between subscales of which 74.3% (n = 289) participants demonstrated intrinsic motivation to learn at posttest than at pre-test. Moreover, 64.3% (n = 258) participants demonstrated extrinsic motivation whereas 36.0% (n = 144) participants demonstrated amotivation to learn at posttest as compared to their motivation status at baseline.

Table 3: Overall Levels of Motivation to Learn and its Subscales among Nursing Students (n = 401)

| Variable                      | Pre-test       | Posttest      |
|-------------------------------|----------------|---------------|
| Overall Motivation to Learn   | 140 (34.9%)    | 282 (70.3%)   |
| Intrinsic Motivation to Learn | 103 (25.7%)    | 289 (74.3%)   |
| Extrinsic Motivation to Learn | 143 (35.7%)    | 258 (64.3%)   |
| Amotivation to Learn          | 257 (64.0%)    | 144 (36.0%)   |

Source: Field Data (2019)

**Factors related to the effect of an Intervention on the overall Motivation to Learn, among undergraduate nursing students between groups**

Chi-square test and cross-tabulation were done to determine the relationship between categorical variables under study. Findings in Table 4 reveals that out of 282 (70.3%) of the study participants who were motivated to learn, 95.5% (n = 128) were in the intervention against 57.0% (n = 154) participants in the control group. It was found that an intervention (Problem-based teaching and learning) pedagogy ($X^2 = 7.041$, p<0.01), accommodation ($X^2 = 11.421$, p<0.01) and the reasons which made students join the nursing program ($X^2 = 9.903$, p<0.05) were significantly related to the overall motivation to learn among undergraduate nursing students respectively. Other variables that did not show a statistically significant relationship with the outcome variable as shown in table.

Table: Factors related to and the effect of Intervention on the overall Motivation to Learn among undergraduate nursing students between groups (n = 401)
| Variables         | Motivation to Learn | P-value |
|-------------------|---------------------|---------|
|                   | Yes     | No     |         |
|                   | n       | %      | n       | %      |         |
| **Groups**        |         |        |         |        |         |
| Intervention      | 128     | 95.5   | 6       | 0.4    | $X^2 = 7.041^a$ |
| Control           | 154     | 57.0   | 116     | 43.0   | 0.008   |
| **Gender**        |         |        |         |        |         |
| Males             | 202     | 67.6   | 62      | 60.8   | $X^2 = 1.552^a$ |
| Females           | 97      | 32.4   | 40      | 39.2   | 0.213   |
| **Age**           |         |        |         |        |         |
| <24 Yrs.          | 20      | 6.7    | 11      | 10.8   | $X^2 = 2.316^a$ |
| 25 – 30 Yrs.      | 220     | 73.6   | 75      | 73.5   | 0.314   |
| >30 Yrs.          | 59      | 19.7   | 16      | 15.7   |         |
| **Marital status**|         |        |         |        |         |
| Singles           | 278     | 93.0   | 93      | 91.2   | $X^2 = 0.356^a$ |
| Married           | 21      | 7.0    | 9       | 8.8    | 0.551   |
| **Accommodation status** |         |        |         |        |         |
| In campus         | 209     | 69.9   | 69      | 67.6   | $X^2 = 11.421^a$ |
| Off-campus        | 90      | 30.1   | 33      | 32.4   | 0.023   |
| **Interest**      |         |        |         |        |         |
| Yes               | 223     | 74.6   | 73      | 71.6   | $X^2 = 0.357^a$ |
| No                | 76      | 25.4   | 29      | 28.4   | 0.550   |
| **Satisfaction**  |         |        |         |        |         |
| Yes               | 227     | 75.9   | 75      | 73.5   | $X^2 = 0.234^a$ |
| No                | 72      | 24.1   | 27      | 26.5   |         |
### Reasons for choosing to nurse as a career

| Reason                          | Frequency | Percentage | Mean | Median |
|---------------------------------|-----------|------------|------|--------|
| Own choice                      | 162       | 54.2%      | 48   | 47.1   |
| Parents/peer pressure           | 52        | 17.4%      | 32   | 31.4   |
| Easier to get a job             | 59        | 19.7%      | 13   | 12.7   |
| Entry qualifications            | 26        | 8.7%       | 9    | 8.8    |

\[ \chi^2 = 9.903^a \]

### Learning difficulties

| Difficulty                              | Frequency | Percentage | Mean | Median |
|-----------------------------------------|-----------|------------|------|--------|
| Inadequate and difficulty in accessing updated learning materials | 61        | 20.4%      | 19   | 18.6   |
| Complex course contents                 | 92        | 30.8%      | 31   | 30.4   |
| Inadequate support from lecturers       | 43        | 14.4%      | 12   | 11.8   |
| Limited time                            | 76        | 25.4%      | 28   | 27.5   |
| No conducive environment                | 27        | 9.0%       | 12   | 11.8   |

\[ \chi^2 = 1.209^a \]

### Source
Field Data (2019)

### The effect of an Intervention on the overall Motivation to Learn among undergraduate nursing students between groups

Binary and multinomial logistic regression was done to determine the extent to which FPBE and the reasons that made nursing students join nursing programs had in motivating them to learn. Findings in Table 5 indicate that participants in an intervention group were 1.720 (AOR) times more likely to be motivated to learn against participants in the control counterparts (p<0.05, CI: 1.122, 2.635). On the other hand, participants who were living on the campus were 0.591 (AOR) times less likely to be extrinsically motivated than the participants who were living out campus (p>0.05, CI: 0.349, 1.002). However, the reasons that made nursing students join nursing programs did not influence motivating students to learn when adjusted to other variables (p>0.05).

**Table 5: Binary, and multinomial logistic regression to determine the effect of an Intervention on Motivation to Learn among undergraduate nursing students, between groups (n = 401)**
### Discussion

**Socio-demographic characteristics of the study participants**

The current study noticed many male students (65.8%) joined the nursing programs as their first choice compared to females. These are discussed in this study to be one of the successes the nursing profession is earning in its revolution as compared to the past where female nursing students were many. However, these findings do not line up with those found by Kusumawaty, Kumara, Emilia & Haryanti (28) and Sabzevari, Abbaszade & Borhani (29), which showed that majority of females selected to join nursing as their priority.

The variation above could be contributed to the day to day awareness creation about nursing programs and its career paths through various Media, advanced roles of nursing, and the need for more qualified nurses' professionals. It is worth to observe both females and males selecting nursing as their pathway to advance their educational careers, for the sake of serving the community, as they were prepared for the patients’ care responsibilities. On the other hand, it was worth too to observe a great number of men joining the nursing profession as this would clear out the belief which has existed for a long time that nursing was for females.
Overall Motivation to Learn and its subscales among Undergraduate Nursing Students

Based on the findings presented above, it has been observed that problem-based teaching and learning pedagogy had a positive influence on motivation to learn among nursing students. Being well accommodated at institutions and individual student's reasons to join nursing programs were found to be protective factors for them to be motivated to learn. Subscales of motivation to learn among undergraduate nursing students were also studied including intrinsic motivation to learn. Students would demonstrate the ability to know what to learn, accomplish the learning activities, and experience stimulation to learn more and more. Participants in an intervention group demonstrated pleasure to learn as they felt that teamwork and being occupied with learning tasks during and after sessions was very importance and could contribute something in their academic progress.

On the other hand, extrinsic motivation to learn among nursing students was also studied. This is an aspect that defines the ways students are motivated to learn through the influence of external stimuli such as environments, peer pressures, punishments, rewards just to mention a few. Undergraduate nursing students who were exposed to the problem-based teaching and learning pedagogy in this study nevertheless were less times likely to be extrinsically motivated to their learning process as compared to their counterparts under the conventional teaching pedagogies. Nursing students demonstrated motivation to learn in the presence of external stimuli.

The status of extrinsic motivation was also observed among nursing students who were living on campus. They were noted to be less times likely to develop extrinsic motivation to learn against students who were living off campus. Majority of nursing students in the control group were learning be identified or recognized by others that they were able to know and solve issues. They demonstrated abilities to adopt values or attitudes they were impressed withby for other famous or intelligent people for them to be accepted by others in their learning process. Moreover, nursing students in the control group were highly motivated to learn owing to the institutional regulations, principles, order, or rules.

Amotivation to learn among nursing students was measured at to determine what discouraged them to learn. It was found that participants who were exposed to problem-based facilitatory pedagogy were less demotivated in their learning processes as compared to their counterparts in conventional teaching pedagogies. This has been discussed in the current study to be of the effect of the intervention and its associated setups and operationalization.

Motivation has always been the central issue in nursing education and even been referred to as the most complex and challenging issue, facing educators, and students today. Various teaching modalities are tested in different settings and programs to help motivate students to learn with minimal support from educators. Tallying with the findings of this study, Gaber et al., (12) found that if well structured, problem-based learning could enhance learning force within a student. An internal force to learn within an individual was observed in their study to be potential in influencing and directing behavior and willingness among students to put efforts into achieving a goal or reward through decreasing their tension caused by their social and academic needs. Based on these facts, the researcher observed that
problem-based teaching and learning pedagogy could positively make nursing students intrinsically motivated to learn and thus, become autonomous learners.

Moreover, findings of this study are not new as they link with those found by Khamoushi et al., (19), which revealed low academic achievements of undergraduate nursing students, to be attributed to the type of teaching pedagogies that educators used. The more the didactic teaching methods were used, the more students were demotivated to their learning process when compared to the usage of constructive teaching pedagogies. They then concluded that there was a necessity to respond to the gap appropriately to improve student’s academic achievements.

Limitation of the Study

During the implementation phase of this study, group leaders were trained to act as facilitators. This would affect their full participation during in-out classroom activities, solving the presented problems in particular. Using group leaders would even make their colleagues not to take into serious their learning roles. The use of quasi-experimental study design would influence selection bias among the study participants as it lacks randomization procedures. Lack of randomization procedures would make difficult representation and generalizability of the study findings.

Conclusions

This study builds on and extends the earlier research findings on the effects of problem-based facilitatory teaching and learning processes. The study believed on collaborative learning among students to improve their motivation to learn. A well-developed and structured problem-based facilitatory strategy has shown to be useful and feasible on influencing motivation to learn among nursing students in the Tanzanian. The effect of problem-based facilitatory teaching and learning pedagogy was attributed the provision of opportunities of interactions among students for them to be able to view and share learning pathways. This was done through the vantage point of problem identification that enabled them to propose learning issues, practice knowledge research and sharing, and then revisit the scenario to solve problems.

The findings indicate that problem-based teaching and learning pedagogy can positively influence the levels of intrinsic motivation to learn among students. Thus, the move to adopt facilitation in a problem-based environment teaching pedagogy in Tanzania is worth considering and needs to be continued. The elements of the problem-based facilitatory pedagogy, which were used in the current study, have the potential contributions to the development of competent graduate nurses. Such findings inform nursing educators that they need to shift from the use of traditional teaching and learning approaches and try modern participatory ones to make nursing students intrinsically motivated to learn.

Abbreviations

AM...............Amotivation
AI.................Auditing Inventory
AMS..............Academic Motivation Scale
AOR...............Adjusted Odds Ratio
CI................Confidence interval
EM................Extrinsic Motivation
EMI...............Extrinsic Motivation Identified
EMIT...............Extrinsic Motivation Introjected
ETR................Extrinsic Motivation external Regulation
FPBE..............Facilitation in a Problem Based Environment
IM................Intrinsic Motivation
IMC..............Intrinsic Motivation towards Accomplishment
IMK..............Intrinsic Motivation to Know
IMS..............Intrinsic Motivation to experience Stimulation
IRRC............Institutional Research Review Committee
NFPBE...........Non Facilitation in a Problem Based Environment
PBL..............Problem-based learning (PBL)
PhD...............Doctor of Philosophy
QMLSN..........Questionnaires on Motivation to Learn Strategies in Nursing (QMLSN)
SD...............Standard Deviation
SPSS.............Statistical Product for Service Solutions (SPSS
UDOM...........The University of Dodoma
WHO.............World Health Organization (WHO)

Declarations
‘Ethics approval and consent to participate: applicable,’ All study participants in the current study will be asked for informed consent for their participation.’ The study was approved by the University of Dodoma (UDOM) Institutional Research Review Committee (IRRC), Ethics Clearance to reach higher Training Institutions: approved by Principals and deans of the respective institutions/schools.

‘Consent for publication: not applicable’

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Contributions To The Literature

- Profession associations as welfare organs may be enlightened about the need to incorporate Facilitation in a Problem-Based Environment (FPBE) into reproductive health educational curricula.
- Findings from this study give light to educational program developers about conditions under which curricula innovations in the nature of FPBE can work in this case.
- Findings constitute a vital knowledge necessary for instructors on how to design and implement curricula basing on FPBE
- Researchers will also use the results as baseline data for further interventional studies or projects in the nature of FPBE

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Figures
Figure 1

A flow chart showing Development and Classroom Tryouts of the Research Teaching Guidelines

Supplementary Files

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