


**Research Article**

## Nursing Student's Perceptions on Formative Assessment Procedures and its Effects on Midwifery Module Performance: A Cross-Sectional Study among Diploma Nursing Students in Tanzania

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### Abstract

**Background:** The issue of low performance among student nurses is still a challenge in theoretical and clinical practice, insufficient use of formative assessment is among the contribution factors.

**Objective:** Assessment of nursing students' perceptions on formative assessment procedures and its effect on midwifery subject performance

**Method:** A Cross-sectional study of 430, third year Diploma Nursing Students' from seven nursing schools was conducted in Kilimanjaro, Dodoma, and Morogoro regions. The approach was quantitative and a sample size was calculated and obtained using simple random sampling technique. Students' perception was measured by 18 questions from the tool adopted and modified from Vaessen[1], performance of students was reviewed and recorded using NACTE form NO.3. Descriptive and Principal Component Analysis used to analyze data of this study.

**Results:** Out of 430 respondents of this study, 221 (51.4%) had positive perception on formative assessment procedures. Also out of 430 respondents, 226(53%) had high performance in midwifery II module with the mean score of 69.85%. Moreover, the association between students perception and performance on midwifery module was not statistically significant ( $X^2= 0.027$ ,  $p=0.870$ )

**Conclusion:** Majority of students' reported positive perception on formative assessment; however, there were no association between perception and actual midwifery module performance, yet, students with positive perception performed high than those with negative perception.

**Keywords:** Formative Assessment; students Perception; Performance; Midwifery Module

### List of abbreviations

AFL – Assessment for leaning; BSN – Berega School of Nursing; CBET - Competence Based Education Training; CHAS - College of Health and Allied Sciences; DECOHAS - Decca College of Health and Allied Science; DIHAS - Dodoma Institute of Health and Allied Science; FA - Formative Assessment; FAF - Formative Assessment Framework; HHTI - Huruma Health Training Institute; KCMC - Kilimanjaro Christian Medical Center; KSN - Kibosho School of Nursing; MHTI – Machame Health Training Institute; MOHCDGEC - Ministry of Health Community Development Gender Elderly and Children; NACTE - National Council for Technical Education; NTA -

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## Back Ground

### Background Information

Students' performance during learning process is governed by the ability of transferring learning and understanding how people develop important competencies. The use of participatory teaching and learning strategies and assessment practices, are the key components in classroom and clinical nursing education practice to determine good and poor student's performance Wiliam, (2018). Moreover, the central part for determining nursing students' performance and future competence mastery depends on frequent assessment and practice. This is based on accurate curriculum, professional teachers and teaching strategies which consider the learners' characteristics and culture [3].

Currently, students face number of academic challenges including low performance in theory as well as in practical. A study done in the United Kingdom on medical student motivation after failure revealed poor performance of medical students who tend to fail each year by 10-15%, in their course examinations. Literature suggest that without strategies, they will continue to fail for 10% yearly, [4], argues that, with the introduction of formative assessment that emphasizes teacher student friendship, courage, and feedback provision it will lead to success in their performances.

Performances in schools stand as a concern in developed and developing countries. However a study conducted in India revealed that low performance is influenced by numerous factors including: attitude of students toward learning, teachers' skills and abilities, classroom environment, inadequate and irrelevant resources and leadership aspects as major contributions to low performances of students [5].

By the use of formative assessment the students' performance gap could be covered, this is according to Benjamin Blooms definition that, formative assessment is a diagnostic testing with range of formal and informal assessment procedures done by teachers during the learning process in order to modify teaching and learning activities to improve student's performances [6]. [7] briefly explained the history of the term formative evaluation by citing that, Michael Scriven (1967) was the first person to practice it. However, Benjamin Blooms was the first person to explain the importance of using formative evaluation in the classroom and its advantages to the learner's achievements. The Blooms idea was later on supported by many researchers in their studies that revealed the success of the students evaluated through formative assessment compared to others not evaluated with formative assessment [8].

Pinchok and Brandt (2009) and the Southeast

Comprehensive Center, (2012) in USA found that students exposed to formative assessment procedures with guided teaching and learning tasks, were having academic improvements and better learning characteristics such: as confidence, positive attitudes and good performance. The benefits of formative assessment procedures were evident almost in those who utilised it during teaching and learning process.

Formative assessment has principles that guide its use as it helps explain what good performance is. It has goals, criteria, and expected standard that enable the courage of self-assessment in learning. Moreover formative assessment brings high excellence evidence to students about their knowledge, it inspires teacher and peer argument about learning, encourage positive motivational beliefs and self-esteem, it offers opportunity to close the gap between current and anticipated performance and provide information to teacher which help to adjust teaching [10]. In Africa, Fakeye (2015) on the other hand, in his study about attitudes on formative assessment reported that, 66.7% of informants agreed that, formative assessment enhances learning and it leads to improved performance. [12], reports that inadequacy of teaching staffs contributes by 29%, as well as ability of teachers to manage classroom contributes by 41% to students poor performances. Likewise, reports indicate that, enough time for classroom teaching contributes by 74%, as it is in inadequate relevant books in school library that contributes by 28% in poor performances. Literatures would further suggest that, unfavorable classroom contributes by 87%, and insufficient clinical instructors contribute by 22% of all failures.

Other factors that are associated with poor performances include the following: unfavorable clinical area that contributes by 59%, while unfavorable dormitories contribute by 59%. In addition, irregular clinical follow up and teaching contribute by 14%. Enough time to put classroom theory into practice in laboratory and clinical skills and feedback to re-teach and re-practice contribute by 44%, and poor implementation of formative assessment that contributes to 60% of all failures.

Literature report that poor performance of student nurses in clinical area remains as a challenge to their competency mastery in Tanzania. This argument is justified by the contributing factors such as poor or ineffective classroom teaching 7.3%, inadequate supervision by tutors 13.3%, unfair clinical assignment 29.2%. Other factors include: lack of competent tutors and clinical instructor 42.7% and students anxiety due to lack of competency 31.2% [13].

In 2005, Tanzania switched from summative assessment to both formative and summative assessment with the aim of bridging theory and practical gap. Dinho & Swai [14] in their study contended that 56% of nurse tutors involved in

the study did not utilize clinical teaching strategies which in turn led to inadequate skills among student nurses. The paper further argues that, improper implementation of formative clinical teaching strategies leads to inadequate skills among student nurses.

## Methods and materials

The aim of the study was to assess nursing students' perceptions on formative assessment procedures, and to assess diploma nursing students' performances in midwifery II module.

This research was a cross-sectional study with quantitative approach, third year Student Nurses who had been assessed formatively for all three years and had completed midwifery II module were the study population. A total of 430 third year students selected from seven nursing institutions in Tanzania mainland by using systematic sampling technique.

Student nurses completed Questionnaire of eighteen [18] questions with four points Likert scale from strong disagree to strong Agree and checklist NACTE F3 used to collect midwifery two students performance from their institution records.

The data were analyzed using SPSS version 20, using descriptive

## Results

### Distribution of demographic characteristic of study participants

The distributions of demographic characteristics showed in the following table including participants' age, sex, level of education attained before joining a college and caregiver who give fees, meals and accommodation.

### Level of Perceptions of Diploma Nursing students on formative assessment procedures

Perception of students on formative assessment were analyzed by principal factor analysis and those items weighted <0.3 were excluded. Descriptive analysis done where mean, median, standard deviations, minimum and maximum were obtained from the item weighted scores;- Mean and Standard Deviation -0.474144+0.89586787, Median 0.1398904, Minimum -4.02188 and Maximum 1.46922.

Data were not normally distributed, hence median used as a cutoff point to categorize those students who had negative perception < median and those who had positive perceptions on formative assessment procedures > median.

As shown in Figure 1, the students' perception on formative assessment procedures 221(51%) had a positive perception while 209(49%) had negative perception toward formative assessment procedures. However, the association between perception and performance was not statistically significant.

### Level of performance on midwifery module among nursing students

The data were normally distributed and mean categorized the level of performance. Those scored below the observed mean, categorically was low performance and the rest were termed as high performance. Majority of the students 226 (53%) had high performance and only 204 (47%) had low performance as shown in figure 4.3.4a.

### Association between students' perceptions on formative assessment with their performance in midwifery module.

With respect to perception, a large number 100(47.8%) students who scored low performance were those with negative perception on formative assessment procedures while students with positive perception, were 104(47.1%) scored low performance compared to others, but the association was not statistically significant ( $X^2= 0.027$ , P-Value=0.870).

## Discussion

### Perceptions of diploma nursing students on formative assessment procedures

Regarding level of perception of students on implementation of formative assessment procedures it was reasonably seen that more than half of the respondents 221(51%) had positive perception. These findings concurred with the study conducted in Turkey, by Ozan & Kincal, (2017)[15] on effects of formative assessment on academic achievement where majority of the study participants had good perception on formative assessment because it enables them to understand better and they used it to help each other.

Furthermore, the study found that, most students value formative assessment procedures during their learning, Majority of the respondents (about by 44.7%, and 63%), strongly agreed with the statements or items used to measure perception that they need formative assessment in their course to study regularly and stay motivated. The results confirmed that, without FA students would have gained less in the midwifery module by 30.1 percent. This result concurs with a study by Vaessen et al., (1) at University of technology in Netherlands in which majority of the respondents agreed that they need frequent assessments in their course to study regularly and stay motivated with loading factors of 0.706 and 0.668 respectively.

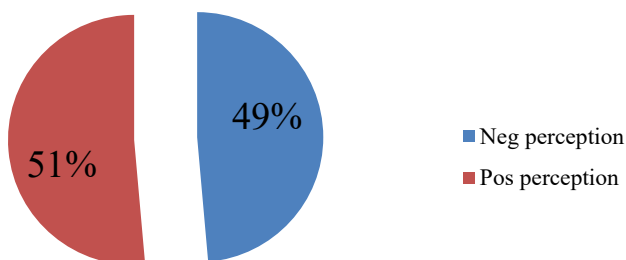
### Nursing Students' Performances in Midwifery Module

In assessing formative assessment performance of diploma nursing students in midwifery module, the study found that most students passed their examination with only few failing. However, schools did not do practical test as part of formative assessment and therefore 312(72.5%) students had no practical test results.

**Table 1:** Shows the frequency distribution of demographic characteristics of third year student nurses (=N 430)

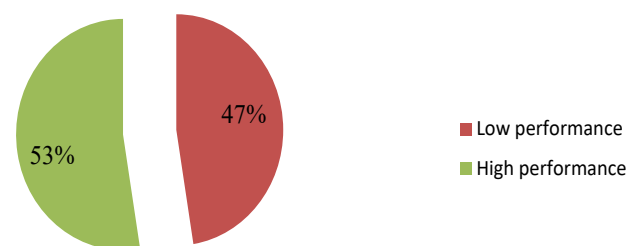
| Variable                           | Variable categories         | Frequency (n) | Percentage |
|------------------------------------|-----------------------------|---------------|------------|
| Institution Ownership              | Government                  | 165           | 38.4       |
|                                    | Private                     | 265           | 61.6       |
| Age (years)                        | <20                         | 62            | 14.4       |
|                                    | 20-25                       | 299           | 69.5       |
|                                    | >25                         | 69            | 16.1       |
| Sex                                | Male                        | 196           | 45.6       |
|                                    | Female                      | 234           | 54.4       |
| Level of education attained        | Form four                   | 241           | 56         |
|                                    | Form six                    | 171           | 39.8       |
|                                    | Other                       | 18            | 4.2        |
| Care giver                         | Parents or guardian         | 321           | 74.7       |
|                                    | Sponsor                     | 61            | 14.1       |
|                                    | Self                        | 48            | 11.2       |
| Motivation to join nursing carrier | passion to save lives       | 326           | 75.8       |
|                                    | Stable job opportunity      | 76            | 17.7       |
|                                    | Good salary                 | 23            | 5.3        |
|                                    | Failed to join other school | 5             | 1.2        |
| Nursing carrier was their choice   | Yes                         | 389           | 90.5       |
|                                    | No                          | 41            | 9.5        |
| The appropriate choice             | First choice                | 262           | 60.9       |
|                                    | second choice               | 131           | 30.5       |
|                                    | third choice                | 18            | 4.2        |
|                                    | None                        | 19            | 4.4        |

**Perception Level**



**Figure 1:** Level of perception of students on formative assessment procedures

**Performance Level**



**Figure 2:** The level of performance on midwifery II among diploma nursing students

**Table 2:** Association between perception on formative assessment procedures and other factors with academic performance in midwifery subject among diploma nursing students (N=430,Chi-square test)

| Academic Performance in Midwifery Modules |                        |           |           |                     |         |
|---|------------------------|-----------|-----------|---------------------|---------|
| Variable                                  | Variable categories    | High n(%) | Low n(%)  | X <sup>2</sup>      | P-Value |
| Institution ownership                     | Government             | 120(72.7) | 45(27.3)  | 43.680 <sup>a</sup> | <0.001  |
|   | Non-government         | 106(40.0) | 159(60.0) |                     |         |
| Number of Formative assessment            | Only one               | 95 (30.4) | 217(69.6) | 22.938              | <0.001  |
|   | Two or more            | 63(53.4)  | 55(46.6)  |                     |         |
| Education level                           | Form four              | 122(47.3) | 136(52.7) | 7.118               | 0.006   |
|   | Form six               | 104(60.5) | 68(39.5)  |                     |         |
| Age (years)                               | <20                    | 23(37.1)  | 39(62.9)  | 7.214 <sup>a</sup>  | 0.027   |
|   | 20-25                  | 163(54.5) | 136(45.5) |                     |         |
|   | >25                    | 40(58.0)  | 29(42.0)  |                     |         |
| Sex                                       | Male                   | 85(43.1)  | 112(56.9) | 12.913 <sup>a</sup> | <0.001  |
|   | Female                 | 141(60.5) | 92(39.5)  |                     |         |
| Motivation to join nursing carrier        | Stable job opportunity | 31(40.8)  | 45(59.2)  | 10.796 <sup>a</sup> | 0.013   |
|   | Good salary            | 18(78.3)  | 5(21.7)   |                     |         |
|   | Passion to save lives  | 175(53.7) | 151(46.3) |                     |         |
|   | Failure                | 2(40.0)   | 3(60.0)   |                     |         |
| Nursing carrier your choice               | Yes                    | 200(51.4) | 189(48.6) | 2.142 <sup>a</sup>  | 0.143   |
|   | No                     | 26(63.4)  | 15(36.6)  |                     |         |
| Appropriate choice                        | First choice           | 140(53.4) | 122(46.6) | 1.722 <sup>a</sup>  | 0.632   |
|   | Second choice          | 64(48.9)  | 67(51.1)  |                     |         |
|   | Third choice           | 10(55.6)  | 8(44.4)   |                     |         |
|   | Not choice             | 12(63.2)  | 7(36.8)   |                     |         |
| Care giver and sponsor                    | parents or guardian    | 179(54.9) | 147(45.1) | 8.013 <sup>a</sup>  | 0.018   |
|   | Yourself               | 16(33.3)  | 32(66.7)  |                     |         |
|   | Others sponsor         | 31(55.4)  | 25(44.6)  |                     |         |
| Perception                                | Positive perception    | 117(52.9) | 104(47.1) | 0.027 <sup>a</sup>  | 0.87    |
|   | Negative perception    | 109(52.2) | 100(47.8) |                     |         |

In the final midwifery performance, most students from all schools passed their theory test examination with only 0.9% failing. These findings are compatible to a study done in eastern Tanzania by Masenga, (2015) and found that majority of the students scored very well in their continuous assessment and only 6% had average low performance. Moreover, the findings herein did not correlate with study done in India on the factors influencing academic performance that revealed student factors like students attitude and their former academic performance while school related factors was large number of students per class and parental factor respectively, [5].

## Conclusion

The study revealed that students' perception on formative assessment practice affects student's performance, although the association was not statistical significant, more than half of the respondents in this study had positive perception on formative assessment procedures carried out on midwifery II module, that led to high performance of diploma nursing students on their final assessments.

## Declarations

### Ethical approval and consent to participate

The researcher obtained permission from the ethical clearance committee, institution board review of university of Dodoma and from principals of the respective nursing institutions. The researcher obtained individual consent from participants and confidentiality was observed. None of the participants' name was filled on the forms rather than code numbers were used to ensure confidentiality.

### Consent for publication

Not applicable

### Availability of data and materials

The dataset used and /or analyzed during the current study are available from corresponding author on reasonable request.

### Competing of interests

The author declares that there was no conflict of interest.

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There was no external source of funding used for this study.

### Author's contributions

SMK senior supervisor assisted in data analysis AM contributed to the interpretation of data. All authors read, commented on and approved the final manuscript.

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