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Stress and Coping Strategies in Clinical Practice Among Nursing and Midwifery Students: A Multicenter Cross-Sectional Study

Yonatan Solomon

yonatnsolomon@gmail.com

Dire Dawa University

Dilnessa Fentie

Dire Dawa University

Mickiale Hailu

Dire Dawa University

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Abstract

Background

Clinical education is a fundamental component of nursing and midwifery training, enabling students to integrate theoretical knowledge with practical clinical skills. However, clinical placements are frequently associated with psychological stress due to academic expectations, patient care responsibilities, and ongoing interactions within a complex healthcare environment. Identifying the magnitude of stress, coping mechanisms, and contributing factors among students is essential for improving the clinical learning environment. This study aimed to assess perceived stress levels, coping strategies, and associated factors among nursing and midwifery students in Ethiopia.

Methods

A multicenter cross-sectional study was conducted among 906 undergraduate nursing and midwifery students of public universities in Ethiopia. Data were collected using a pre-tested structured self-administered questionnaire that incorporated the perceived stress scale (PSS). Bivariable and multivariable linear regression analysis were performed to examine the association between the predictor and the outcome variables. Regression coefficients (β) with 95% confidence intervals were used to identify independent predictors and statistical significance was set at $p < 0.05$.

Results

The perceived stress level among nursing and midwifery students during clinical training was moderate (1.85±.47) (ß=23.15, p<.001) with a statistically significant model F (9, 894) = 18.48, p < .001, R2 = .329. Presence of relatives (ß=1.076, p=.035); study year (ß=2.437, p<.001), perception of the learning environment (ß=.072, p<.001), perceived clinical teaching effectiveness (ß=1.907, p=.001), avoidance coping strategy (ß=.162, p=.012), problem-solving coping strategy (ß=.275, p<.001) and transference coping strategy (ß=.903, p<.001) were predictors of perceived stress level.

Conclusions

Nursing and midwifery students experienced moderate stress during clinical training influenced by multiple variables. Improving clinical learning environments, and teaching effectiveness, and promoting adaptive coping strategies may help overcome stress. Departments should also consider implementing orientation programs and stress-management support.

Trial registration:

Not applicable

Background

Stress is generally described as a physiological and psychological response that arises when individuals perceive that environmental demands exceed their available resources or coping capacity [1, 2]. Within educational contexts, stress can influence students' learning processes, performance, and overall wellbeing [3]. Coping strategies refer to the cognitive and behavioral efforts used by individuals to manage internal or external demands that are perceived as challenging or overwhelming [4].

Different theoretical models have defined stress differently. According to Holmes and Rahes, stress is defined as: "an independent variable stimulus or load produced in an organism, creating discomfort, in such a way that whether tolerance limits are surpassed, stress becomes insufferable, appearing then psychological and physical problems" [31]. The definition of stress that is relevant to our study comes from Lazarus and Folkman's model which defines stress as: "A particular relationship between the person and the environment that is appraised by the person as taxing and/or exceeding his or her resources and endangering his or her well-being" [30].

Clinical practice is the method by which students learn to apply theory in a clinical situation, allowing for the integration of theoretical knowledge and practical abilities, resulting in the art and science of the profession [5]. In clinical environments, students may face numerous challenges, such as learning to use high-tech medical equipment, maintaining positive relationships with clinical staff and instructors, managing sudden changes in a patient's condition, and dealing with the demands of patients' relatives [6].

Because clinical training makes up the majority of the nursing and midwifery curriculum, stress is frequent among students, particularly during their first year [7]. Stress at this time can lead to a variety of negative consequences, including poor academic performance [8], increased burnout [9], and decreased personal well-being [10 & 11], as well as disrupted social and family relationships, work skill loss, and increased absenteeism [12]. All of these things are counterproductive to the training goal of preparing effective professionals. As a result, clinical educators must be aware of the elements that may cause spikes in stress levels among nursing and midwifery students, as well as the adaptive mechanisms individuals employ to cope with stresses [13].

Previous studies conducted in Saudi Arabia, Egypt, India, and at the international level revealed that nursing students experience moderate to high levels of stress from various stressors (caring for patients, assignments and workloads, negative interactions with staff and faculty, lack of clinical competence, and taking of examinations) [13, 14 & 15]. Some factors associated with perceived stress were gender, family income, lack of emotional support, and lack of acceptance [16], the presence of relatives in nursing [17], student's age [18], years of education, and self-decision to join nursing [14]. But other findings reveal no significant relationship between demographic factors and stress levels [15].

As far as the researchers' knowledge is concerned, no previous study was conducted on the topic of interest in Ethiopia, particularly in the study area. The researchers also want to investigate the effect of clinical teaching effectiveness and students' perception of the learning environment on nursing and midwifery students' stress levels, which have never been studied previously.

In addition, the researchers' experience indicates that the students stress in the clinical setting that limits their learning. This problem and the literature gap motivated researchers to carry out the study. Thus, this study aimed to investigate the stress, coping strategies and associated factors among nursing and midwifery students at Dire Dawa, Haramaya, and Jigjiga Universities.

The findings of the study could be used by health sciences teachers and clinical instructors to develop effective teaching and learning strategies in clinical settings that could reduce stress and employ adaptive coping behaviors to deal with it. It could also be used by Ethiopian Nursing Association (ENA), the Ethiopian Midwifery Association (EMA), the Johns Hopkins Program for International Education in Gynecology and Obstetrics (JHPIEGO), and the Federal Ministry of Health (FMOH) as a baseline data or a new project area. In addition, it could also be used as a base line data for interested researchers in the topic area.

Methods

Study area and study period

The study was conducted from March 1/2021 to May 1/2021 in the three public universities, namely, Dire Dawa University (DDU), Haramaya University (HU), and Jigjiga University (JJU). The total number of health science students is 1,415; of this, 959 were comprised of nursing and midwifery students [HU-262, JJU-525 and DDU-172].

Study Design

A multi-center cross-sectional study.

Population

All nursing and midwifery students found in all three public universities were the source population, while all nursing and midwifery students found in all three public universities that fulfilled inclusion criteria were the study population.

Inclusion and Exclusion Criteria

All B.Sc. nursing and midwifery students with a minimum of 1 clinical attachment experience (a minimum of 2-month hospital practice experience) and available during the data collection period were included, while post-basic students were excluded from the study.

Sample Size Determination and Sampling Technique

Since the census was conducted, all study subjects (959) were included in the study. The data were collected by six data collectors using a self-administered structured questionnaire that inquired about

information regarding demographics, perceived stress scales, coping behaviors, perceptions of the learning environment, and perceived clinical teaching effectiveness variables.

Measurements:

It includes information regarding the demographic characteristics of participants, including age, sex, religion, marital status, academic score, academic credit hours, current university year, and interest in the profession. In addition, the Perceived Stress Scale (PSS), Coping Behavior Inventory (CBI), Dundee Ready Education Environment Measure (DREEM), and the Cleveland Clinic's Clinical Teaching Effectiveness Instrument (CCCTEI) were used.

PSS: - it is a five-point Likert scale that examines stress and stressors among nursing students. It consists of 29 items divided into six categories: 'Stress-related to taking care of patients (8 items), 'Stress due to teachers and nursing staff (6 items), 'Stress due to assignments and workload' (5 items), 'Stress due to peers and daily life (4 items), 'Stress due to lack of professional knowledge and skills (3 items), and 'Stress due to clinical environment' (3 items). The responses vary from "never" to "always" for each item: (4-very often, 3-fairly often, 2-sometimes, 1-almost never, and 0-never). Higher stress levels are indicated by higher scores. The Cronbach's alpha of PSS has been reported to be 0.86–0.89 [19], and for the current study, it was 0.87.

CBI: - it is a five-point Likert scale used to identify nursing students' coping strategies. The scale has indicated that 19 items separated into four subscales: six for avoidance, six for problem-solving, four for optimism, and three for transference coping behavior. The responses ranged from 'never' to 'always' for each item (4-always, 3-frequently, 2-sometimes, 1-infrequently, and 0-never). High scores indicate more usage of coping behavior. Cronbach's alpha of the CBI has been reported to be 0.75–0.84 [20], and for the current study, it was 0.81.

The Cleveland Clinic's Clinical Teaching Effectiveness Instrument

The instrument has 15 questions that use a five-point evaluation scale. Cronbach's alpha of the instrument was reported as 0.93 [21] and for the current study it was 0.88.

DREEM

It is an instrument designed for the measurement of students' perceptions of the learning environment specifically for undergraduate medical and health-related education and has 50 items with a 5-point Likert scale [22]. The Cronbach's alpha of the current study was 0.82.

Data quality assurance

Prior to the start of the data collection, data collectors and supervisors participated in a one-day training session. During the data collection period, completed questionnaires were reviewed daily by the research team to ensure completeness and accuracy of the obtained data.

Five percent of the questionnaire was pre-tested at Harar Health Sciences College to assess its reliability, clarity, sequence, consistency, and understandability, as well as the total time it takes to finish the questionnaire before the actual data collection.

Study Variables

Perceived stress was the dependent variable and the independent ones were; **s**ocio-demographic characteristics [age, sex, academic score, living conditions, and current university year], coping behavior, perceived clinical teaching effectiveness, and perception of the learning environment.

Operational Definitions

Perceived students stress: - The questionnaires were administered in English language and the total score ranges from a minimum of 0 up to a maximum of 116. Higher scores signal a higher degree of stress. The following scale was used to determine the level of stress: High Stress if the mean is between the scales of 2.67–4.00, Moderate Stress if the mean is between 1.34–2.66, and Low Stress if the mean is between 0–1.33 for [19].

Coping strategies: - The questionnaires were administered in English language and higher scores for each factor represent more recurrent use of a certain type of coping behavior [20].

Clinical teaching effectiveness: - The questionnaires were administered in English language and the higher score shows, the higher perception of the teaching effectiveness in the clinical setting [21]. But for mainly descriptive purposes, it was classified based on the mean score (39.31 ± 9.85) as effective or not effective. Accordingly, the students perceived clinical teaching is effective if the score is above the mean score, while perceived clinical teaching is not effective if the score is below the mean score.

Perception of a learning environment: - The questionnaires were administered in English language and the score ranges from 0 to 200 with higher scores indicating a more positive evaluation [22].

Statistical analysis

Data were entered into a database using Epi Data version 3 and analyzed through SPSS version 25. To clean the data, descriptive and frequency analyses were used. The shape of the data distribution was determined using scatter plots, skewness, and kurtosis. Based on this information, the data were determined to be reasonably normally distributed, so no transformations were required, but seven items were found to be an outlier for PSS score and left out of the respective analysis.

For each subscale, the participant's responses on each item were scored and summed. The PSS score ranges from a minimum of 0 to and a maximum score of 116. The higher the sum score, the higher the stress level. This was used as a continuous dependent variable in a linear regression model. First, mean PSS scores were compared by independent variables using an independent sample t-test, and an ANOVA was used after checking the assumptions.

Bi-variate and multivariable linear regression were done to see the association between the predictor and the outcome variables. Variables with a P-value less than 0.25 in the bivariate analysis were included in the multivariable model. ß-coefficients and 95% CI were used to show independent predictors of perceived stress. Statistical significance was set with a P-value of less than 0.05. Tables, charts, and graphs were used to summarize and display the findings. Linear regression assumptions (linearity, normality, and multicollinearity) were also tested.

Results

Socio-demographic Characteristics of the Study Participants

From the total number of 959 source populations; 913 questionnaires were collected from the respondents (18 questionnaires were unfilled, 12 questionnaires were not returned, and 23 questionnaires were incomplete), giving the response rate of the study to be 94.47 %.

From the study participants, 461 (50.9%) were female and 875 (96.6%) were single. The participants' ages ranged from 20 to 28 years with a mean age of 22.81±1.61 years. The majority (68.7%) of the respondents were in the age group of 20-23 years.

Regarding the department of the participants, more than half (51.7%) of them were from the Nursing department. The majority (58.2%) were from Jigjiga university, and 335 (37%) of the participants were in the 3rd year. The participants CGPA ranges from 2.00 to 3.98 with a mean CGPA of 3.21±0.41

Considering the participants filed of choice, more than half (54.3%) of them are not their first filed choice and four hundred seventy-two (52.1%) have relatives in their field of study. The majority (86.3%) of the participants lives inside campus with roommates (Table 1).

Table 1: Distribution of Nursing and Midwifery students by their characteristics in Eastern Ethiopia, March 2021 (n=906).

Participant characteristics		No	%
Sex	Female	461	50.9
	Male	445	49.1
Age category	20-23	622	68.7
	24-28	284	31.3
Marital status	Single	875	96.6
	Married	31	3.4
Department	Nursing	468	51.7
	Midwifery	438	48.3
Current study year	2nd year	329	36.3
	3rd year	335	37.0
	4th year	242	26.7
University	Dire Dawa	149	16.4
	Haramaya	230	25.4
	Jigjiga	527	58.2
First field choice	Yes	414	45.7
	No	492	54.3
Presence of relatives in the profession	Yes	434	47.9
	No	472	52.1
Living conditions	With family	84	9.3
	Inside campus	782	86.3
	Outside campus	40	4.4

Level and Type of Perceived Stress by Nursing and Midwifery Students

The level of total stress as perceived by students during their clinical training ranged from 7 to 74 (mean 53.18, SD 13.32) with the overall PSS mean score of 1.85 (SD 0.47) out of a possible score of 5 showing that the participated students experienced a moderate level of stress. The most common type of stress perceived by nursing students was stress from their area of practice (mean 2.17, SD 0.73) and the lowest levels of stress were from lack of professional knowledge and skills (mean 1.51, SD 0.82). From the individual items, the most stressful events experienced by students were stress from experience

discrepancies between theory and practice (mean 2.48, SD 1.19) and the least stressful were can not get along with other peers in the group (mean 1.34, SD 0.92) (Supplementary table 1).

Coping strategies of Nursing and Midwifery students

Based on students' responses to the adoption of coping behaviors, it was observed that the CBI scale had an overall mean (SD) score of 40.07 ± 7.73 with a range of 57 (9–66). "Problem-solving" was the most adopted (mean 2.48, SD 0.66), and "avoidance" was the least practiced coping behavior (mean 1.43, SD 0.66). Among all items in the CBI scale, "To keep an optimistic and positive attitude in dealing with everything in life" was the most employed (mean 3.02, SD 0.91) and "To quarrel with others and lose temper" was the least employed (mean 0.94, SD 0.88) coping behavior to deal with stress (supplementary table 2).

Nursing and Midwifery Students' Perception of the Learning Environment (DREEM)

More than half (56.3%) of the students have more positive than negative perceptions about their learning environment, while only 0.4% of them have an excellent perception of their learning environment (Figure 1).

Nursing and Midwifery Students' Perception of Clinical Teaching Effectiveness

469 (51.8%) of the students perceive that the clinical teaching is not effective while the rest 437 (48.2%) of them perceives that clinical teaching is effective (Figure 2).

Using an independent sample t-test, mean scores were compared between sex category, age, living conditions, presence of relatives, marital status, field choice, and perceived clinical teaching effectiveness with the "PSS scale means". The results indicated that students who live with their families have a mean score of 1.84 (SD.53) which is significantly greater than those who do not (mean=1.69, SD=.56 at t=-2.291 and p=0.02). The effect size for the difference between the groups was calculated using Cohen’s d, resulting in a value of 0.31, which is considered a small effect.

The mean scores of PSS have also shown variation against age categories. Students found in the age group of 20-23 years old with a mean of 1.79 (SD .59) were significantly higher than the mean of students means in the age group of 24-28 years old (mean=1.67, SD= .48 at t= -3.125 and p=0.002). The effect size was small, with a Cohen’s d of 0.31. Those students who perceive the clinical teaching is not effective to have shown a significantly higher mean score (mean=1.76, SD=.58) than those students who perceive the clinical teaching is effective (mean=1.66, SD=.54 at t=2.578 and p=.010). The effect size for the difference between the groups was calculated using Cohen’s d, resulting in a value of 0.32, which is considered a small effect.

The other statistically significant mean difference was observed between the presences of relatives in the profession category. Those students who don't have relatives in the profession have a higher mean (mean=1.76, SD=.59) than those students who have relatives in the profession (mean=1.66, SD=.51 at

t=-2.672 and p=.008). The effect size was small, with a Cohen's d of 0.32. But there was no significant mean difference seen in field choice, marital status, and sex (Table 2).

Also, mean scores were compared using one-way ANOVA among current study year groups of student nurses and midwives. PSS mean score differed significantly among the three current study year groups, [F (2, 903) = 7.54, p = 0.001)] with a corresponding Welch test [F_W (2, 903) = 3.389, p=0.034)] and the Brown-Forsythe test [F_{BF} (2, 903) = 3.421, p=0.033)]. So, there was a statistically significant difference in the mean PSS among the different levels of the study year. In this study model, about 63.15% of the variability in PSS was attributed to the current study year (Table 3).

The LSD (Bonferroni) Post Hoc test shows that the 2nd year study group's mean score of 1.77; SD .59 differed significantly from the 3rd year group's mean score of 1.72, SD .56 at p=.025, and the 3rd year study group's mean score 1.72, SD .56 differed significantly from the 4th year group's mean score 1.67, SD .52 at p=.030 (Table 3).

Table 2: Independent Sample t-test showing the relationship between different categories of students and PSS mean score among Nursing and Midwifery students in eastern Ethiopia, 2021 (N=906).

Variable's category		PSS score							
		N	Mean ± SD	*df*	Levene's Test	*T*-test	Mean d/c	95% CI	P
					F	t			
Lives with family	Yes	84	1.84 ± .53	904	.315	-2.291	-.147	-.27, -.021	**0.02**
	No	822	1.69 ± .56						
Is Field first choice	Yes	414	1.74 ± .55	904	2.691	1.535	.057	-.02, .13	.125
	No	492	1.68 ± .57						
Marital status	Single	875	1.71 ± .56	904	4.415	1.370	.118	-.084, .319	.180
	Ever married	31	1.82 ± .47						
Sex	Male	445	1.74 ± .55	904	.157	1.629	.061	-.012, .134	.104
	Female	461	1.68 ± .57						
Age	20-23	622	1. 79 ± .59	904	5.427	-3.125	**-**.116	-.19, -.043	**.002**
	24-28	284	1. 67 ± .48						
Clinical teaching is effective	Yes	437	1.66 ± .54	904	.079	2.578	.096	.023, .169	**.010**
	No	469	1.76 ± .58						
Presence of relatives	No	434	1. 76 ± .51	904	4.754	-2.672	-.098	-.17, -.026	**.008**
	Yes	472	1. 66 ± .59						

Table 3: One Way ANOVA and Robust Tests of Equality of Means of nurses and midwifery students' PSS mean score in public universities of eastern Ethiopia, 2021 (N=906).

Variables	PSS- One Way ANOVA					
Current study year		**Sum of Squares**	***df***	**Mean Square**	**F**	**Sig.**
	Between Groups	2.108	2	1.054	3.357	.035
	Within Groups	283.562	903	.314		
	Total	285.670	905			
	Levene's Test	[t (2,903) =3.754, p<0.100]				
	PSS -Robust Tests of Equality of Means					
		Statistic	**df1**	**df2**	**Sig.**	**Eta Square**
	Welch test	3.389	2	582.846	.034*	0.6315
	Brown-Forsythe	3.421	2	887.719	.033*	
	Levene's Test	[t (2,903) =3.860, p<0.100]				

Note: *Significant at p-value of <0.05.

Abbreviation: *df*, degree of freedom.

Predictors of Perceived Stress among Nursing and Midwifery Students

In the Bivariable analysis, variables with a p-value of 0.25 were added to the final model. In the model, presence of relatives, current living conditions, perception of the learning environment, avoidance, problem-solving, transference and staying optimistic coping strategies, perceived clinical teaching effectiveness, and study year were entered through the entering method.

From these variables; the presence of relatives, perception of learning environment, avoidance, problem-solving, transference coping strategies, perceived clinical teaching effectiveness, and study year were found to be significant predictors of the level of PSS among nursing and midwifery students.

The absence of family or relatives in a study profession increases the perceived stress score by 1.076 times (p=.035). A unit increase in students' study year decreases the perceived stress score by 2.437 times at p<.001. For a unit increase in the perception of the learning environment; the perceived stress score decreases by .072 times at p<.001. The same is true for clinical teaching effectiveness; a unit increase in the clinical teaching effectiveness score decreases the perceived stress score by 1.907 times at p=.001.

Of the four sub-scales of CBI; a unit increase in the avoidance sub-scale score of CBI increases the perceived stress scale score by .162 times at a p=.012 and a unit increase in the problem-solving sub-

scale score decreases the PSS score by .275 at a p<.001. A unit increase in the transference sub-scale score increases the PSS score by .903 at a p<.001 (Table 4).

Table 4: Factors associated with perceived stress in Nursing and midwifery in Multivariable Analysis among Nursing and midwifery students in public universities of eastern Ethiopia, 2021.

Model	Unstandardized Coefficients		p	95.0% CI for B	
	B	Std. Error		Lower Bound	Upper Bound
Constant	23.15	2.08	.000	19.06	27.23
DREEM score	-.072	.017	**.000****	-.104	-.039
Clinical teaching effectiveness score	-1.907	.533	**.001****	-2.953	-.861
Living conditions with family without family (Ref)	1.090	.804	.175	-.487	2.668
Study year	-2.437	.543	**.000****	-3.502	-1.372
Presence of relatives No Yes (Ref)	1.076	.508	**.035****	.078	2.074
Avoidance sub-scale score	.162	.064	**.012****	.036	.289
Problem solving sub-scale score	-.275	.069	**.000****	-.410	-.140
Staying optimistic sub-scale score	-.167	.105	.111	-.373	.038
Transference sub-scale score	.903	.110	**.000****	.539	.969

*a. Dependent Variable: Perceived stress scale score; for the final model: adjusted R^2 =0.329, Maximum VIF=1.570, Minimum VIF=1.123, **: significant for multivariable linear regression*

Discussion

The result of the current study revealed that the perceived stress level of nursing and midwifery students was moderate (1.85±.47) which was similar to studies done in Egypt, Saudi Arabia, and international studies [16, 18, & 15]. This could be possible because students are expected to complete extensive clinical placement hours as well as a range of projects such as case studies, care plans, and personal recordings. The stress levels associated with completing these activities are known to be significant for the students [23].

This study found students' years of study to be a significant predictor of perceived stress level, with senior students having lower stress perceptions compared to junior nursing students. This finding is similar to a study conducted in India, China, and Spain [14, 7, & 24]. This is due to there is a positive change in stress, coping, and personality in nursing students from the beginning of the program until the graduation [25].

Those students who have no relatives in their profession have a higher perception of stress than their counterparts. This finding is similar to a study conducted in Saudi Arabia, revealing that the presence of relatives in nursing predicted perceived stress [17]. It might be that those relatives may help students by sharing their experiences with the stressors they deal with and using more adaptive coping behaviors. This shows students are using a social support coping mechanism by talking to their relatives supporting Lazarus and Folkman's work that states when faced with stress, an individual employs problem-centered coping strategies that involve seeking social support, managing time effectively, and engaging in active problem-solving. These strategies target the root causes of stress and provide long-term stress relief [30].

The most important finding of this study was the significant predictive ability of the DREEM score. The more students perceive there is a good learning environment in their study, the lesser they perceive stress. Even though there is no study on this issue in nursing and midwifery students; there is a comparable finding on medical students, pointing out the presence of a significant negative correlation between students' perceptions of the learning environment and stress level. Students with a positive perspective toward their learning environment have a normal or mild stress level [26]. This could be because if students have a positive perception of their learning environment; it is more of an indication of enjoyment rather than stress. According to Lazarus and Folkman's definition of stress, it is important to consider the effects of the environment which in our case is the students' perception of the learning environment that has proven to affect the levels of students' stress [30].

The other most important finding was the presence of a significant association between the clinical teaching effectiveness score and perceived stress scale score. The more students perceive the clinical teaching as effective, the lesser they perceive stress. Though there are no previous studies that show this relationship; the possible reason could be that more students perceive the clinical teaching is effective, the more they are engaged in the practice environment, which in turn decreases stress.

The results of this study also showed that those students who choose to use avoidance as a coping strategy to deal with stress have more perceived stress and this finding was comparable with previous studies in Saudi Arabia and Jordan [17 & 27]. It is scientifically proven as avoidance coping is a maladaptive form of coping in which a person changes their behavior to avoid thinking about, feeling, or doing difficult things [2].

The other finding of the study also revealed that those students who choose to use the problem-solving approach as a coping strategy to deal with stress have less perceived stress. This finding is supported by previous studies in Saudi Arabia and Jordan [17, 27 & 28]. This may be since problem-solving is a

cognitive-behavioral process that provides potential effective responses to a difficult situation, and increases the possibility of selecting the best solution [29]. According to Folkman and Lazarus, problem-solving is one of the more effective ways to deal with stress, as it focuses on behaviors to manage or alter the problem [30].

Lastly, those students who choose to use the transference approach as a coping strategy have more perceived stress. This finding was also supported by other findings from the previous studies in Saudi Arabia and Jordan [17, 27 & 28]. This finding is an affirmation of Lazarus and Folkman's work that considered transference as an undesirable coping mechanism as it can prevent individuals from developing healthy coping skills and addressing the root causes of stress [30].

As a limitation, literature was scarce on this topic in our country so that comparison of study results was done with other countries where the health institutions setup, health policy, and other factors were quite different. Besides, some of the variables that become significant predictors haven't been tested anywhere in the world, which makes the discussion part challenging. Another was the use of a self-administered questionnaire, which had several drawbacks. Using a cross-sectional design limited the usability of the results.

But, as a strength of the study; this research has found two newly identified significant predictors of perceived stress level, which were perception of the learning environment and perceived clinical teaching effectiveness. In addition, we have used Lazarus and Folkman's model of stress and coping for our study and to support the findings in the discussion. This research is also the first on its kind in Ethiopia and conducting it at a multicenter site is another strength.

Conclusion

Perceived stress levels of nursing and midwifery students during clinical attachments were moderate, and the predictors were the presence of the relatives, perception of learning environment, avoidance, problem-solving and transference coping strategies, perceived clinical teaching effectiveness, and study year. Lazarus and Folkman's model of stress and coping clearly helps to understand the level of stress nursing and midwifery students' experience, identify stressors and their corresponding coping strategies employed by the students.

As a recommendation, the students should get a prior orientation on clinical areas such as hospital situation, arrangements, ward facilities, rules, regulations, and policies of the hospital. Offering of stress management counseling, establishing peer and family support systems, and formulating of hospital policies may also support students. A follow-up study utilizing a longitudinal design may give a better picture of this issue.

Declarations

Ethics approval and consent to participate

The study was implemented in accordance with the Declaration of Helsinki (World Medical Association, 2001). Approval for the study was obtained from the Dire Dawa University research ethics review committee, with reference number RCSVP/162/2021. Informed consent was obtained from each participant after the data collectors briefly explained the objective of the study. Since the participants were not minors, guardian/parental consent were not obtained.

Consent for publication

Not applicable

Availability of data and materials

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

Competing interests

The authors declare no competing interests.

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Authors' contributions

[YS]: Conceptualization, Formal Analysis, Data curation, Methodology, Writing – original draft, Writing – review & editing. [MH]: Data curation, Methodology, Writing – original draft, Writing – review & editing. [DF]: Formal Analysis, Methodology, Data curation, Writing – original draft, Writing – review & editing. All authors reviewed and approved the final manuscript.

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Authors' information

Yonatan Solomon (*yonatnsolomon@gmail.com/yonatan.solomon@ddu.edu.et*, Dire Dawa University, Dire Dawa, Ethiopia)

Dilnessa Fentie (fagitaabo@gmail.com, Dire Dawa University, Dire Dawa, Ethiopia)

Mickiale Hailu (michiale1493@gmail.com, Dire Dawa University, Dire Dawa, Ethiopia)

Corresponding author: Yonatan Solomon, email- yonatnsolomon@gmail.com, yonatan.solomon@ddu.edu.et, Dire Dawa University, Dire Dawa, Ethiopia)

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Figures

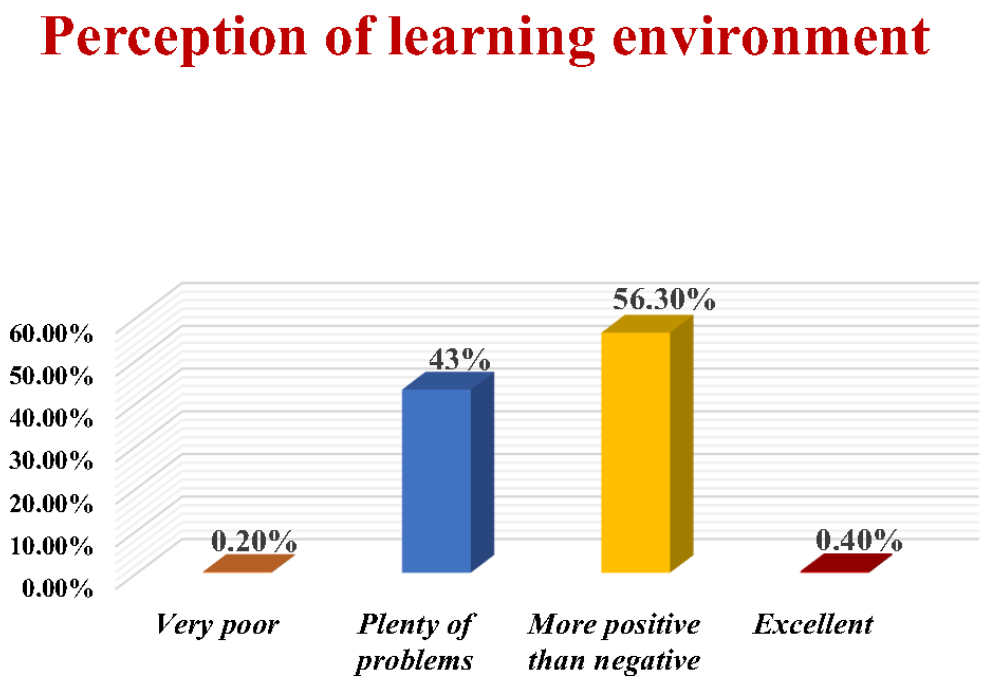


Figure 1: Showing nursing and midwifery students' perception of learning environment in public universities of eastern Ethiopia, 2021 [N=906].

Figure 1

See image above for figure legend

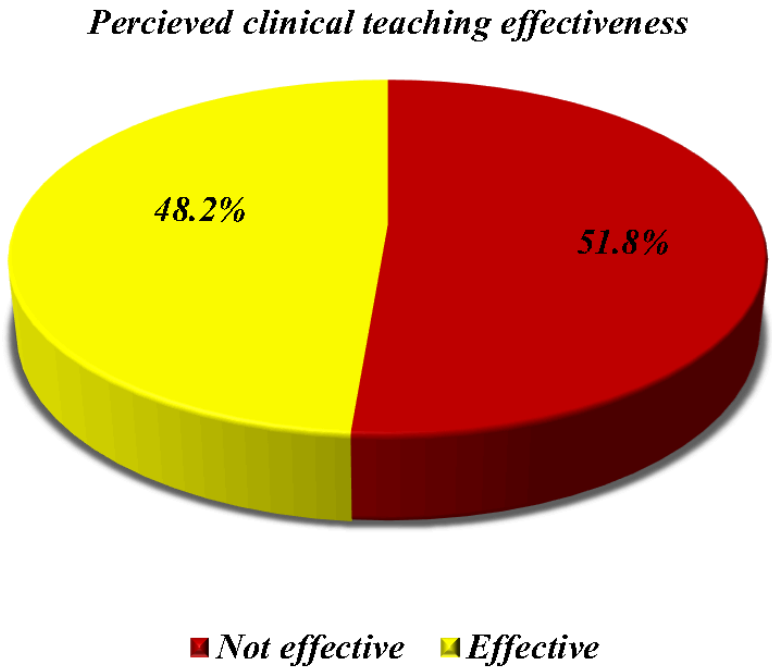


Figure 2: Showing nursing and midwifery students' perception of clinical teaching effectiveness in public universities of eastern Ethiopia, 2021 [N=906].

Figure 2

See image above for figure legend

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