Perceived Stress and Coping Behavior among Future Nurses: A Cross-Sectional Study in West Bengal, India

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Abstract

Background: Demanding clinical and academic environments have been potential sources of stress among nursing students. Inability to cope effectively often potentiates this stress. If not intervened early, this may have a detrimental effect on health and may eventually affect the future workforce in rendering care. **Objectives:** The objective of this study was to explore the levels and sources of perceived stress and coping behavior among undergraduate nursing students in West Bengal. **Materials and Methods:** This descriptive cross-sectional study was conducted in two nursing training institutions in West Bengal, from July to September 2018, using a validated pretested self-administered questionnaire comprising demographics, Perceived Stress Scale (PSS), and coping behavior inventory (CBI). Students having at least 6 months of clinical exposure were invited to participate. Of 256 eligible students, 182 returned completed questionnaires, giving an overall response rate of 71%. Descriptive statistics, Pearson's correlation, and multiple regression analysis were performed using SPSS 16.0 software. **Results:** "Stress from assignments and workload" and "problem-solving" was the most prominent stressor and coping behavior (Factor rank 1) respectively among students. Statistically significant correlation was observed between overall mean PSS and CBI score ($r = 0.306$, $P < 0.01$). Years of education, self-decision to join, increased screen time, staying at hostel significantly predicted stress ($R^2 = 0.248$, $F = 9.640$, $P < 0.01$), and coping behavior ($R^2 = 0.223$, $F = 10.077$, $P < 0.01$) among students. **Conclusions:** Stress from academics and clinics were high among nursing students. As they are the future carers, it is apt to intervene early to mitigate their stress and enhance their coping skills during professional training and practice.

Keywords: coping, nursing education, nursing students, stress

INTRODUCTION

Stress is an inevitable part of our fast-paced life. Over the years, "stress" has evolved from being just a "response to stimuli" to the complex "person-environment transactions/interactions." Stress as "transaction" was first construed by Lazarus and Folkman[1] in their "Transactional theory" which dealt with "cognitive appraisal of stress" and ascribed stress as stimuli perceived as harmful, threatening, or challenging that exceeds an individual's adaptive (cognitive and behavioral) capacity.[1,2]

In our career-driven society, stress from work can have a myriad of negative effects on health and organizational performance.[3,4] Its ubiquitous presence in the nursing profession is well-documented.[5,6] With over 6 million-strong workforce, the nurses form the backbone of our nation's health-care delivery system.[7] Demanding situations intrinsic to the job often expose these professionals to a higher magnitude of stress which not only have implications on

their health but also affects their long-term professional capabilities, often leading to poor performance, increased absenteeism, and burnout.[8-10] Since future of this profession depends much on the nursing students, and it is apt to invest early at this stage. Like professional nurses, student nurses also face stress in various forms and extent.[11-13] Pressures from academics, acquiring clinical competencies, and complex work environments have been potential stressors in nursing education due to their negative consequences on student's health and well-being.[13,14] Persistent exposure to stress may not only affect the cognition but also can impede the

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Access this article online

Quick Response Code:

Website:
www.ijcm.org.in

DOI:
10.4103/ijcm.IJCM_200_19

performance of a student and may result in the development of certain noncommunicable diseases including mental illnesses, namely, depression or anxiety.[15] Although certain research has reported that often some amount of stress is beneficial as it acts as a powerful motivator for learning[16] but chronic exposure to stress and failure to implement positive coping effectively may have an adverse effect on their health, well-being and scholastic performance.[17] If potential stressors are not recognized early, these may eventually affect the future workforce in rendering care.

Thus, the onus lies with the nursing educators to prepare future nurses to withstand all these adversities and carry out professional responsibilities effectively during practice to ensure consistent quality of care in the long run. Thus, the American Nursing Association under their "Healthy Nurse Healthy Nation" initiative had rightly mentioned - *"A healthier nurse means healthier patients."*

Limited research in the Indian context had investigated the levels and sources of perceived stress and coping among undergraduate nursing students. Therefore, this study was conducted to assess the levels and sources of perceived stress, to explore their coping behavior and the relationship between perceived stress and coping behavior among these student nurses to find out how prepared are our future nurses to cope with stress.

MATERIALS AND METHODS

This descriptive study with the cross-sectional design was conducted among undergraduate nursing students enrolled in two nursing teaching and training institutions situated in Paschim Medinipur district in West Bengal from July to September 2018.

Sample size estimation
The sample size was estimated based on correlation (r = 0.228) of "stress from assignment" and "coping (avoidance)" behavior in a previous study.[12] Significance level of 5% (α =0.05 i.e., Z_α =1.96) with 80% power (β =0.2 i.e., Z_β =0.84) were used to calculate sample size using formula: [18] $([Z_\alpha + Z_\beta]/C)^2 + 3$; where $C = (0.5) * \ln ([1 + r]/[1 − r]) = 0.232$. The minimum estimated sample size (n) was 149.

Sampling method
Out of all enrolled students (344) in the two conveniently selected study institutions, those having at least 6 months of clinical exposure were included (256) in the study. Those who did not give informed written consent and/or returned incomplete questionnaire were excluded from the study. Out of all students who fulfilled the inclusion criteria, 182 completed and returned the self-administered questionnaire (SAQ) and hence were included in the final analysis giving an overall response rate of 71% [Figure 1].

Study tools
A predesigned pretested SAQ comprising sociodemographics and background information of respondents and
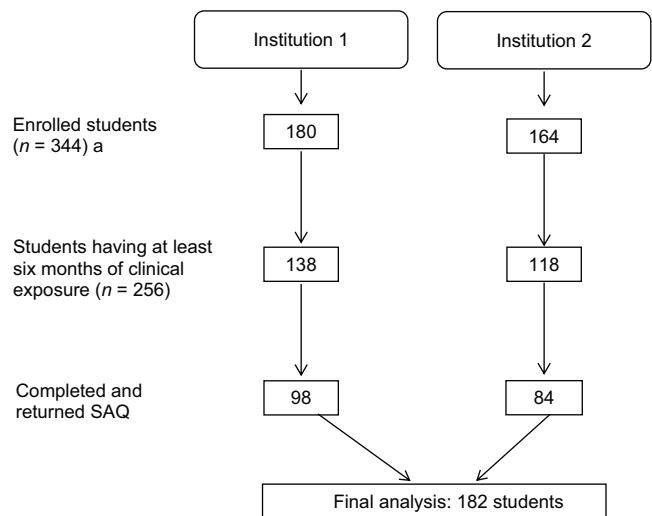
Figure 1: Flow diagram showing selection of participants

two standardized instruments as developed by Sheu *et al*.[17] Perceived Stress Scale (PSS) and coping behavior inventory (CBI) were used. These tools were used to assess the type and degree of stress faced and coping strategies adopted. Since, English was the mode of teaching and training at the study institutions, validated English versions of the questionnaires were used.

PSS is a 5-point Likert scale, consisted of 29 items, grouped into six factors. The six factors include: "stress from taking care of patients" (8 items), "stress from teachers and nursing staffs" (6 items), "stress from assignments and workload" (5 items), "stress from peers and daily life" (4 items), "stress from lack of professional knowledge and skills" (3 items), and "stress from the clinical environment" (3 items). Total scores ranged from 0 to 116. Higher the score higher was the degree of stress.

CBI was developed to identify nursing students' coping strategies. CBI had 19 items divided into four subscales: *avoidance* behaviors (6 items); *problem-solving* behaviors (6 items), *optimistic* coping behaviors (4 items), and *transference* behaviors (3 items). Higher scores indicate more frequent use of a certain type of coping behavior. Possible responses for both these instruments ranges from "never" to "always" and are scored from 0 to 4.

Statistical analysis
Descriptive statistics were performed to assess the level of stress and coping behavior, based on which item and factor ranking was done. Pearson's correlation test was used to determine the correlation between PSS and CBI. Multiple linear regression analysis was performed to identify the factors associated with stress. To test for normality, Histogram and Kolmogorov–Smirnov tests were used. Data were analyzed using the Statistical Package for the Social Sciences version 16 (SPSS Inc., SPSS for Windows, Chicago, USA).

Results

Participants' background characteristics

All the participants (182) were females with mean (standard deviation [SD]) age of 20.1 ± 1.3 years, range 7 years (17–24). 53.8% were enrolled in BSc Nursing course and rests in Diploma (GNM) course. Majority of the participants were unmarried (96.7%), Hindu (91.8%), and lived in a nuclear family (78.5%). Mean (SD) per capita income of the participants was 5439 ± 3715 (INR). 66.5% of the participants resided at the college hostel, whereas others stayed at home/paying guests.

Perceived level of stress among nursing students

Observed total mean (SD) PSS score among respondents was 63.7 ± 14.3 with a range of 64 (32–96), interquartile range 20.2. Factors and items in the PSS were ranked based on the mean responses of the participants. Out of six factors of PSS, "*Stress from assignments and workload*" was the most prominent stressor (Factor rank 1) and of all 29 items, "*Worrying about bad grades*" was the most reported stressor item with mean (SD) being 2.86 ± 0.90 (Item rank 1) among student nurses. PSS stress factor "*Stress from taking care of patients*" was the least perceived source of stress [Table 1]. The Kolmogorov–Smirnov test statistic exhibited a value of 0.065, df = 182, $P > 0.05$ ascertaining the normality of the dependent variable (PSS).

Coping behaviors adopted by nursing students

Based on students' responses on the adoption of coping behaviors, it was observed that the CBI scale had an overall mean (SD) score of 41.4 ± 5.57 with a range 33 (20–53). "*Problem solving*" was the mostly adopted coping behavior (Factor rank 1), and "*avoidance*" was the least practiced coping behavior (Factor rank 4) among the students. Among all items in the CBI scale, "*to employ past experience to solve problems*" was the most employed (Item ranking 1) coping behavior to deal with stress [Table 2]. Among all coping behavior items, "*relaxation via watching television, movies.*" ranked 7 with a mean (SD) 2.70 (0.63), and it was observed that mean screen time among the participants was 2.6 ± 1.12 h per day. The Kolmogorov–Smirnov test statistic also demonstrated the normality of the CBI scale (0.059, df = 182, $P > 0.05$).

Correlation between Perceived Stress Scale and coping behavior inventory subscales

Bivariate analysis was performed to find out the correlation (using Pearson's correlation) between PSS and CBI subscales. "*Avoidance*" behavior was found to have a significant positive correlation with all the stress factors in PSS except "*stress from peers and daily life*." Although "*problem-solving*" was the highest reported coping behavior, it was observed that with increased stress, "*Problem-solving*" capacity decreases among students. Significant correlation (r) was also observed between overall PSS and CBI score ($r = 0.306$, $P < 0.01$) [Table 3].

Correlates of stress and coping

Multiple regression analysis was done to predict stress and

Table 1: Stressors perceived by participating nursing students (*n*=182)

PSS	Factor ranking	Mean±SD
Overall mean PSS factor score	-	2.05±0.40
I. Stress from taking care of patients (8 items)	6	1.69±0.50
II. Stress from teachers and nursing personnel (6 items)	3	2.11±0.59
III. Stress from assignments and workload (5 items)	1	2.65±0.57
IV. Stress from peers and daily life (4 items)	2	2.14±0.68
V. Stress from clinical nursing training environment (3 items)	4	1.98±0.65
VI. Stress from lack of professional knowledge and skills (3 items)	5	1.73±0.56

PSS: Perceived Stress Scale, SD: Standard deviation

Table 2: Coping behaviors as reported by the study participants (*n*=182)

Factor of CBI	Factor ranking	Mean±SD
Overall mean CBI factor score	-	2.21±0.26
I. Avoidance (6 items)	4	1.70±0.60
II. Problem-solving (6 items)	1	2.65±0.51
III. Stay optimistic (4 items)	2	2.44±0.38
IV. Transference (3 items)	3	2.06±0.64

CBI: Coping behavior inventory, SD: Standard deviation

coping behavior among nursing students. During analysis, explanatory variables with lower variance inflation factors were incorporated to address the issue of multicollinearity. Increase in "years of education," "studying in diploma," and "self-decision to join nursing," were associated with lesser stress, whereas, "increased screen time" and "shifts during clinical posting" and "staying at the hostel" were associated with higher stress among nursing students. The results indicated that predictors in model 1 explained 24.8% of the variance of the dependent variable (perceived stress) ($R^2 = 0.248$, $F = 9.640$, $P < 0.01$). In model 2, the variance of dependent variable (coping behavior) explained by the explanatory variables was 22.3% ($R^2 = 0.223$, $F = 10.077$, $P < 0.01$). Increasing age, self-decision to join nursing, staying at hostel significantly predicted coping capacity among nursing students. Significant F-test statistics in both cases demonstrated that the models were of good fit [Table 4].

Discussion

As evident from the mounting literature,[19] stress in nursing education has been a cause of concern for both nursing educators and policymakers. Higher perceived stress is often associated with poor health outcomes, poor coping, and poor academics and may adversely affect the future workforce in rendering quality patient care.

The results showed the overall mean PSS factor score of 2.05 revealed that the participants in our study had similar

Table 3: Correlation between Perceived Stress Scale and Coping behavior inventory subscales (Pearson's coefficient)

	Avoidance	Problem-solving	Stay optimistic	Transference	Overall CBI
Stress from taking care of patients	0.439**	−0.280**	−0.181*	0.165	0.175*
Stress from teachers and nursing personnel	0.241**	−0.173*	0.035	−0.049	0.076
Stress from assignments/workloads	0.397**	−0.209*	0.015	0.117	0.217*
Stress from peers and daily life	0.083	0.029	−0.063	−0.122	0.049
Stress from clinical environment	0.353**	−0.017	0.154	0.127	0.319**
Stress from lack of professional knowledge and skills	0.305**	−0.197*	0.061	0.054	0.149
Overall PSS	0.442**	−0.138	−0.015	0.107	0.306**

*Correlation is significant at the 0.05 level, i.e., *P*<0.05, **Correlation is significant at the 0.01 level, i.e., *P*<0.01. PSS: Perceived Stress Scale, CBI: Coping behavior inventory

Table 4: Results of multiple regression analysis to predict stress level and coping capacity among student nurses (*n*=182)

Variables	PSS (model 1)			Variables	Coping behaviour score (model 2)		
	B	SE	β		*B*	SE	β
Years of nursing education	−4.257	1.510	−0.228**	Age (completed years)	−1.728	0.354	−0.412**
Course (diploma)	−10.19	2.109	−0.355**	Years of education	0.457	0.622	0.063
Self-decision to join nursing	−7.071	1.969	−0.239**	Course (diploma)	−2.288	0.797	−0.205**
Screen time (h)	1.861	0.872	0.146*	Staying at hostel	3.619	0.833	0.307**
Shifts during clinics	11.290	2.303	0.393**	Self-decision to join nursing	−1.564	0.773	−0.136*
Staying at hostel	1.218	2.174	0.040	-			
R^2		0.248				0.223	
F		9.640**				10.077**	

P<0.05, **P*<0.01. β: Standardized linear regression coefficient, SE: Standard error, PSS: Perceived Stress Scale

findings with that of Labrague *et al.*,[12] had higher scores when compared to the research findings of Sheu *et al.*[17] and Jimenez *et al.*[20] Among the six PSS subscales, stress from assignments and workloads (factor ranking 1) was the highest reported source of stress, consistent with findings from previous studies[12,21,22] but discordant with that of Sheu *et al.*[17]

Discordantly, study by Singh *et al.*[23] reported lesser perceived stress scores among North Indian nursing students. Another study by Prasad *et al.*[24] incongruously revealed that there were mild stress and average coping among 1st-year BSc nursing students with no significant correlation between stress and coping mechanisms.

Among the different coping behaviors, "problem-solving" was the most reported coping strategy in our study. Finding was similar to study among Saudi Nursing students[25] but was dissimilar among Chinese nursing students.[17,22]

In contrast, findings from Hamaideh *et al.* showed that ways of choosing nursing and the presence of relatives in nursing predicted the perceived stress level with an overall variance of 12.4%, which was much higher in our study. Unlike in our study, mothers' educational level and stress from peers and daily life were significant predictors of coping behaviors among Saudi nursing students.[21]

Although our research did not address the content or context of screen usage, its increasing usage was found to be associated with higher perceived stress conforming to the study findings

of Wu *et al.* where higher screen time usage increases the risk of developing stress and mental health problems.[26]

Conclusions

In an endeavor to unveil the psychological well-being of our future nurses, the study investigated the level and predictors of perceived stress and coping behavior among undergraduate nursing students during their professional training. Findings have demonstrated that perceived stress level was high among these students and problem-solving was the principal coping behavior adopted. Since they are future carers of patients, higher level of stress may affect the patient care in the long run. Hence, measures must be taken to mitigate their stress and enhancing their coping capacity through early identification of potential stressors and designing effective interventions in the form of stress management counseling, creation of peer group, modified course curriculum, etc., thereby enhancing their performance.

Often nursing educators are more focused on the educational needs of students, but it is equally essential to remain cognizant as these students are at risk of developing mental health problems owing to their young age, pressures from complex work environments. Thus, understanding the nature and sources of stress and ways of coping will help creating a supportive learning environment, effectively plan educational programs and curricula, and thereby preparing the future workforce for providing quality patient care.

Despite all our efforts, there were certain methodological limitations in terms of using self-reported questionnaires which may be a potential source of reporting bias. The sampling technique was non-probabilistic in nature impairing external generalizability of findings across all nursing institutions. Inspite of all these constraints, our study made an attempt to unveil the psychological well-being of our future nurses. Future prospective researches are recommended as they may provide better insight in terms of understanding the intensity of stress and its impact on their health, patient care over time.

Conflicts of interest

There are no conflicts of interest.

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