Identification of stressors and quantification of stress among veterinary students in India using a cross-sectional questionnaire survey

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Research Article

Keywords: Academic stressors, Correlation, Veterinary education, Students, India

Posted Date: November 23rd, 2022

DOI: <https://doi.org/10.21203/rs.3.rs-1241384/v4>

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Version of Record: A version of this preprint was published at Frontiers in Public Health on November 1st, 2022. See the published version at <https://doi.org/10.3389/fpubh.2022.1059610>.

Abstract

Veterinary education, being a rigorous professional training programme, exposes students to significant academic and non-academic pressures. Identifying the stressors and evaluating stress levels among veterinary students can help with the development of coping techniques to protect students' mental health. A 44-item based cross-sectional questionnaire survey was prepared and disseminated among veterinary students in India with the goal of identifying the stressors responsible, measuring the amount of stress, and relating stress to characteristics like as gender and family income. The data from the questionnaire was evaluated using a variety of statistical factors. The survey had a high level of internal consistency. More than 95% of pupils were found to be stressed, with levels ranging from moderate to severe. Academic stressors were the primary cause of increased overall stress. In comparison to male students, female students reported higher levels of overall stress, academic stress, and intrapersonal and interpersonal stress. Students from lower-income families experienced increased overall stress as well as stress connected to family expectations. Gender, family income, academic stressors, intrapersonal, interpersonal, and career-related stressors, and social activities-related stressors all positively predicted overall stress among students. These factors should be given special consideration when developing any stress-reduction or stress-reduction strategies for Indian veterinary students. To the best of our knowledge, this is the first study in India to identify stressors and quantify stress among veterinary students.

Introduction

Stress is a non-specific response of the body to the various events which enables the individuals to perceive and cope with adversities in both physical and social environments (Gelberg and Gelberg 2005). The events leading to stress are considered as stressors. The relationship between the response of an individual to a possible stressful stimulus is complex and is mediated by several variables, such as socio-cultural, psychological, physical, environmental as well as individual factors (Williams et al. 2005).

Veterinary education is a rigorous professional degree program with a heavy workload that demands significant personal time (Kogan et al. 2005). Although challenges are part of every professional curriculum and in the subsequent phases of life transition, veterinary education has its pattern of situations that may cause students to feel pressured and overwhelmed (Kogan et al. 2005). For example, the constant comparison with medical counterparts within initial days of admission, maintenance of good academics scores for fellowship, lower stipend for internship and conflicts with farmers etc. are far more common events for veterinary students especially in India. Due to such a challenging environment, concerns have risen for the mental well-being of veterinary students, specifically the assessment of the impact, prevalence, and management of stress, anxiety, and depression among students (Nahar et al. 2019). The academic stressors have been previously documented as one of the main stressors impacting veterinary as well as medical students' well-being leading to adverse outcomes such as depression and anxiety (Reisbig et al. 2012). The speed and the bulk of content to be learned, lack of clinical, study, and time management skills, concerns about being compared with peers, and ethical problems related to learning are common subfactors comprised with academic stressors (McLennan and Sutton 2005; Killinger et al. 2017). In a comparative study in Australia veterinary students were found to be more stressed stress as compared to medical students and practicing veterinarians and medical officers (Yang et al. 2019).

Veterinary students like are also prone to non-academic stressors, such as family issues or relationships, personal health concerns, and financial concerns (Killinger et al. 2017). For some students, these stressors might be the initiating factors for mental health problems such as debilitating stress, anxiety, and depression (Reisbig et al. 2012; McArthur et al. 2019). The inter/intrapersonal, professional, or work-related interactions as well as conflicts between animal and human interests predispose the veterinary students to stress (Williams et al. 2005; Wells et al. 2021). The lack of career opportunities along with insulting remarks by politicians in recent times in India just adds to the stressors list veterinary students are subjected to (unpublished data). Additionally, students in the fourth and final year of under graduation (UG) and postgraduate (PG) students involved in clinical practice at university/college clinics are more likely to experience emotional aspects of patient and client care while dealing with the death of animals, challenging clients (angry or non-cooperative) or managing various aspects of the death of animals, due to lack of time for recreation, due to conflicts with staff, and mistakes in diagnosis (Williams et al. 2005). These events might have long term mental impact on veterinary students and can lead to other inevitable consequences such as suicidal tendencies (Bartram and Baldwin 2010).

The stress experienced at graduation level may expand into the professional lives of veterinarians as practitioners and as academicians (Nahar et al. 2019). Although manageable levels of stress for a reasonable duration might serve an important stimulant to meet life's challenges but chronic stress can have a deleterious effect on emotional, psychological, and physical health (Mariotti 2015). A large number of studies are surfacing to map the stress and their effects on veterinary students worldwide, but the research to identify the stressors and quantification of stress associated with these stressors is still lacking worldwide, including India. In the Indian context, there is hardly any scientific report, about stress, anxiety, or stressors among veterinary students. Therefore, this study was designed with aim to identify the stressors and their impact on veterinary students in terms of stress induced and to provide the students with a validated self-reporting survey to assess the level of stress they are subjected to. To the best of our knowledge and available literature search, this is the first Indian study quantifying the stress and mapping various stressors among veterinary students in India.

Method

Study design, Sampling, and Procedure

For the present study, a cross-sectional questionnaire survey was designed using Google forms with 50 items initially. After analysis of formal testing responses by a pilot survey on 20 undergraduate (UG) students of the Lala Lajpat Rai University of Veterinary and Animal Sciences, Hisar, Haryana, India (LUVAS), six items due to irrelevant and controversial nature (admission quota, caste, worst incidents of academic life and abuse by teachers etc.) were excluded, leading to 44 closed items. These were grouped into six categories viz. academic-related stressors (ARS), inter or intrapersonal, and career related stressors (IPCRS), teaching and learning-related stressors (TLRS), exams and evaluation related stressors (EERS), social activities related stressors (SARS) and family expectations related stressors (FRS), based on previous medical and veterinary literatures (Yusoff et al. 2010; Gupta et al. 2015; Jayarajah et al. 2020). Students currently enrolled in various veterinary universities/colleges of India in UG (BVSc & AH), and PG (MVSc and Ph.D.) degree courses were included in the survey. The participation in the study was voluntary, and consent was obtained in the questionnaire itself to participate in the study. As per inclusion criterion the students with more than six months of the admission in veterinary curriculum were included and the students who had just completed the final year exam were excluded from the survey to avoid confounding bias. The sample size was calculated using the 'Raosoft calculator' (<http://www.raosoft.com/samplesize.html?nosurvey>). The sample size of 377 was estimated based on 50% response distribution, a 5% margin of error, and 95% confidence interval. The expected response proportion of 50% was assumed as there was no such study earlier. So, a total of 1000 questionnaires were sent to students at different veterinary institutes of India through emails and/or personal contacts and social media groups. The questionnaire was administrated by using the online interface of Google Forms (Google LLC, Mountain View, CA, USA) to the target population, and the survey remained open for a period of two months from July 2021-August 2021.

Survey Instrument

The survey instrument comprised of 44 web-based items organized into six categories as mentioned above. The first section collected socio-demographic data of students specifically gender, age, religion, family income and degree year, state of residence, and college/university currently pursuing degrees. The remainder of the items were based on rating the intensity of stress caused by each item on a Likert scale of 0 (causing no stress) to 4 (causing extreme stress) (Likert, 1932). For example, "How much stress heavy workload causes to you?" with a response option on the scale (0-no stress at all; 1-causes mild stress; 2-causes moderate stress; 3- causes high stress; 4- causes severe stress). The items were placed randomly to avoid the carryover effect of responses. Students' responses to all items were anonymous, and the survey instrument was designed to take 10–15 min to complete. The scoring of values for quantification of stress level was done by obtaining the mean values for each of the categories/subscales and the scores were rated as no or mild stress (0.00–1.00), moderate (1.01-2.00), high (2.01-3.00), and severe (3.01-4.00).

Data Analysis

All the data analyses were performed using the Statistical Package for Social Science (SPSS) v. 20. The questionnaire and items were analysed for validity, reliability, association, and regression modelling. The questionnaire utilized exploratory factor analysis to determine whether new factors (subscales) could be created and to examine the structure of the relationship between questionnaire items. Principal component analysis (PCA) using Promax rotation and scree plot was used to extract the factors with an Eigenvalue of more than one. Correlation analysis was used to examine the independence of the new factors as a measure of construct validity. The Cronbach's alpha was used to measure each factor's internal reliability and alpha value if an item was deleted (Downing 2004). The reliability of the newly loaded factors was tested by performing the Cronbach's alpha for each subscale separately. The level of stress along various domains such as gender, income, professional degree year, and age was analyzed using the Chi-square test. The correlation matrix was run to study the inter-item correlations of all factors as well as non-demographic variables. The anti-image correlation was performed to measure sample adequacy for individual items. Internal consistency and reliability of the questionnaire were measured using Cronbach's alpha. The Kaiser-Meyer-Olkin (KMO) test and Bartlett's test of sphericity were used to determine the sampling adequacy and to assess the factorability of the correlation matrix. To justify factor analysis Bartlett's test should be significant and KMO values should exceed 0.60 (Tabachnick and Fidell 2019). A series of hierarchical regression analyses were conducted to investigate which stressors significantly predicted the overall stress among the students. For all the categorical variables dummy coding was used (for example, dummy coding for male = 1 and female = 2). In the regression analysis gender was entered in step 1, as according to the chi-square test it has a significant association with stress. In step 2, degree year was added assuming that it might predict the stress among undergraduate students. In step 3, family income was added as chi-square has shown significant association with overall stress. Finally, in step 4, the six stressors (EERS, ARS, FRS, SARS, IPCRS, and TLRS) were added. Only a single dependent variable (i.e., overall stress) was used.

Results

A total of 611 veterinary students of India from 14 states and 27 colleges/universities provided their consent to participate in the study, with a response rate of 61.1% (611/100). Table 1 concludes the participants' demographic breakdown. The mean age of respondents was 23.2 ± 2.8 years old with the majority identified as male (63.6%) respondents. A total of 247 (40.4%) students had family income below 2 lakhs. Maximum students (67.10%) were from undergraduate (BVSc and AH) degree years, followed by MVSc students (27.33%) and Ph.D. students (5.57%).

Table 1
Descriptive statistics (n = 611)

	M (SD)	n (%)
Age	23.2 (2.8)	
Gender		
Male		388 (63.50)
Female		223 (36.50)
Religion		
Hindu		558 (91.32)
Muslim		19 (3.10)
Christian		13 (2.12)
Buddhist		10 (1.63)
Sikh		7 (1.14)
Others		4 (0.65)
Veterinary degree year		
BVSc and AH 1st year		59 (9.65)
BVSc and AH 2nd year		80 (13.09)
BVSc and AH 3rd year		98 (16.04)
BVSc and AH 4th year		78 (12.76)
BVSc and AH 5th year		95 (15.55)
MVSc		167 (27.33)
Ph.D.		34 (5.56)
Family income		
Below 2 lakhs		247 (40.42)
2–5 lakhs		191 (31.27)
More than 5 lakhs		173 (28.31)

Construct validity

The exploratory factor analysis was used to determine the construct validity of the questionnaire. The KMO that measures the adequacy of sampling adequacy was applied and the value was found to be 0.957. The KMO value obtained for the present study thus indicated the very high sampling adequacy. The Bartlett's test of sphericity was found highly significant (chi-square = 1222, $p < 0.001$) which again indicated that factor analysis might be useful with our data. The total numbers of components were extracted using PCA and Promax rotation (oblique rotation). The initial exploratory factor analysis resulted in the extraction of eight factors with Eigenvalue > 1 (Fig. 1) that collectively explained 56.98% of the overall variance of the data. As two out of the eight factors comprised only two items and there was shared variance between factors, items were forced to a six-factor reduction, with suppression of coefficients below 0.30. The six-factor reduction explained 51.98% of the total variance. The loading of each item to the new factors was based on the factor loading and our construct as in the method section. The factor structure along with communalities and internal consistency of each item along with factors is detailed (Table 2). The items were included to each category as loaded by the factor analysis. In this study, the scores of the items within each subscale were summed, and the mean score of each subscale was used to represent the stress level of the students in six already designed categories: academic-related stressors (ARS), interpersonal, intrapersonal, and career-related stressors (IPCRS), teaching and learning-related stressors (TLRS), examination and evaluation stressors (EERS), social activities related stressors (SARS) and family expectations related stressors (FRS). A mean score of than 1.0–2.0 was taken as stress and 2.0–3.0 was taken as a high stress. Overall stress was calculated by summing up the mean score values from each subscale and taking the average and then evaluating by the same method as used for each subscale.

Table 2
Loading of variables on factor from the rotated component matrix

Name of Factor	Item Label	Factors (can be adjusted in a single column)						Communalities*	Cronbach's alpha if item deleted
		1	2	3	4	5	6		
ARS	Rude behavior of college staff	.785						.572	.882
	Ignorance of problems by administration	.760						.567	.882
	Lack of teaching skills of teachers	.750						.553	.882
	Biasness/favors of teachers for selected students	.644						.451	.885
	Lack of guidance regarding future jobs by university/college	.607						.589	.883
	Perception of a gap in learning and practice	.520						.565	.880
	Conflicts with animal owners and activists	.487						.458	.886
	Lack of professional skills	.449						.565	.883
	Leniency in evaluations in other colleges	.436						.459	.889
	Deviation of actual protocols in treatment by teachers	.423						.451	.886
	Lack of guidance from teachers in the study	.357						.518	.884
	Not enough study material	.308						.503	.883
	Conflicts with other students	.356						.381	.891
	Verbal/physical abuse by other students	.318						.516	.889
IPCRS	Perception of failure to establish a career		.767					.614	.848
	Unable to answer questions from pet owners		.635					.558	.853
	Fear of getting poor marks		.625					.655	.846
	Facing the death of an animal at clinics		.599					.408	.865
	Lack of time for revision of content		.573					.607	.851
	Need to do well (by others)		.481					.527	.852
	Self-expectation to do well		.474					.464	.860
	Preparing competitive exams		.445					.410	.861
	Difficulty in understanding content/course		.337					.531	.852
TLRS	Lack of recognition/praise for your work			.657				.536	.828
	Frequent interruption of work by others			.619				.500	.827
	Stress while working with computers			.609				.549	.838
	Difficulty in finding a person to talk to			.568				.550	.825
	No feedback by teachers			.564				.547	.821
	Conflict with teachers			.551				.511	.821
	Unable to answer in class			.431				.599	.822
	Lack of communication among teachers			.412				.570	.824
	Self-Unwillingness to study veterinary science discipline			.318				.342	.839
EERS	The stress of examination or tests/viva				.848			.615	.782
	Frequent examinations				.697			.591	.779
	Heavy workload				.663			.567	.770
	The stress of class presentation/discussion				.620			.545	.802

	Falling behind in study schedule	.450	.557	.779
	Inappropriate assignments by teachers	.402	.530	.791
SARS	Talking to animal owner's history taking	.722	.584	.578
	Fear of clinical practice (injection/surgery)	.473	.491	.604
	Parental wish to study the field other than veterinary science	.399	.376	.638
	Lack of time for family and friends	.354	.403	.595
FRS	Financial problems (family debt)	.637	.536	.592
	Family responsibilities/expectations	.585	.526	.593

*Communalities are estimates of the variance accounted for by each variable in the factor solution

Reliability

The questionnaire showed high internal consistency owing to its Cronbach's alpha value at 0.957 which lies in excellent grade. Moreover, Cronbach's alpha values of subscales ranged from 0.647 to 0.892, indicating good internal consistency (Table 3). When individual items were removed, Cronbach's alpha ranged from 0.578 to 0.889 showing that all the items contributed to the adequacy of the scale (Table 2). Additionally, an anti-image correlation with individual items also confirmed that the sampling was adequate ($p < 0.001$) for further analysis. Inter-factor correlations, as well as correlations of factors with other variables of the questionnaire (gender, income, and degree year), were examined using bivariate variation (Spearman's rho) as shown in Table 4. Inter-factor correlations ranged from between 0.006 and 0.608, which indicates generally acceptable independence. The highest correlation between ARS and IPCRS (0.608) indicates some overlap between these two factors. All the factors, except IPCRS, had a higher discriminant ability and were statistically significant ($p < 0.05$). All the factors were significantly correlated with overall stress except for FRS and TLRS, and these two seem to have a lower discriminant ability to measure overall stress than other factors. Correlation between factors and other variables varied from .006 to .280. ARS and overall stress were significantly correlated to gender and income but not to degree year. The inter-item total correlation value was more than 0.3 for 20 items. The rest of the items, however, had a lower but statistically significant correlation and there was no considerable change in Cronbach's alpha with the deletion of any item, which indicates acceptable reliability. Therefore, all 44 items were included in the questionnaire. Cronbach's alpha value of each stressor group is shown in Table 3 and Cronbach's alpha value if scale item deleted value for an individual item is shown in Table 2.

Table 3
Questionnaire factors with mean score and reliability estimates
(Cronbach's alpha)

Stressor Groups	Number of Items	Mean (SD)	Cronbach's alpha
ARS	14	2.88 (0.79)	0.892
IPCRS	9	2.82 (0.86)	0.868
TLRS	9	2.46 (0.89)	0.843
EERS	6	2.64 (0.86)	0.813
SARS	4	1.95 (0.84)	0.670
FRS	2	2.54 (1.05)	0.647

Table 4
Correlation among all main measures (N = 611)

	1	2	3	4	5	6	7	8	9	10
1. ARS		.608**	-.006	-.093*	-.011	.018	.701**	.220**	-.081*	.063
2. IPCRS			.018	-.010	-.070	.054	.748**	.280**	-.008	-.049
3. TLRS				.531**	.500**	.532**	-.022	.057	-.047	-.079*
4. EERS					.488**	.368**	-.083*	-.010	-.035	-.069
5. SARS						.358**	-.098*	-.043	-.130**	-.068
6. FRS							.034	.016	-.114**	-.098*
7. Overall Stress								.172**	-.141**	-.006
8. Gender									.197**	.204**
9. Income										.155**
10. Year										
*p < 0.05										
**p < 0.01										

Stress and its relations with other variables

All the students reported some degree of overall stress. Students with a mean score of more than 1.0 i.e., those who reported scores in the moderate, high, and severe category were considered under stress. Overall, for 611 students, 94.10% (575) were under stress (mean score more than 1.0), out of which 59.65% (343/575) students had high to severe stress (mean score more than 2.0). A total of 11.45% (70/611) were under severe stress. The most important stressors group among veterinary students was ARS (95.58%) followed by IPCRS, TLRS, EERS, SARS, and FRS as shown in Table 5. In summary, Table 6 shows that female students significantly experienced more overall stress and ARS and IPCRS were more important stressors for them as compared to male students. The students who had less than 2 lakhs of annual family income significantly experienced high overall stress as compared to students having a higher family income. The students of the second year of bachelor's degree experienced significantly higher SARS as compared to others and students of the first year of bachelor's reported significantly higher stress due to FRS.

Table 5
Stress due to each factor

Factors	n (%)
ARS	584 (95.58)
IPCRS	569 (93.12)
EERS	556 (90.99)
TLRS	536 (87.72)
FRS	486 (79.54)
SARS	404 (66.12)
*N=61, Mean score more than 1.0	

Table 6
Significant relation of gender, family income, and degree year with overall stress and individual factors.

Individual factors.			
Variables		Frequency, n (%)	p-value (Chi-square)
Gender			
Overall stress	Male (389)	356 (91.51)	p < 0.001
	Female (222)	219 (98.64)	
ARS	Male (389)	363 (93.31)	p < 0.001
	Female (222)	221 (99.54)	
IPCRS	Male (389)	350 (89.97)	p < 0.001
	Female (222)	219 (98.68)	
Income			
Overall stress	Below 2 lakhs (247)	234 (94.73)	p < 0.001
	2–5 lakhs (191)	179 (93.71)	
	More than 5 lakhs (173)	162 (93.64)	
FRS	Below 2 lakhs (247)	208 (84.21)	p < 0.001
	2–5 lakhs (191)	142 (74.34)	
	More than 5 lakhs (173)	136 (78.61)	
Degree year			
SARS	First-year (59)	31 (52.54)	p < 0.005
	Second-year (80)	65 (81.25)	
	Third year (98)	69 (70.40)	
	Fourth year (78)	52 (66.66)	
	Final Year (95)	69 (68.42)	
	MVSc (167)	95 (56.88)	
	Ph.D. (34)	23 (67.64)	
FRS	First-year (59)	59 (100)	p < 0.001
	Second-year (80)	70 (87.50)	
	Third year (98)	88 (89.79)	
	Fourth year (78)	54 (69.23)	
	Final Year (95)	73 (76.84)	
	MVSc (167)	121 (72.45)	
	Ph.D. (34)	21 (61.76)	

Table 7
Hierarchical regression of independent variables on overall stress among veterinary students

Variable	B	SE B	Beta	Sig.	R ²	Adjusted R ²	Δ R ²	F change in R ²
Step 1								
Gender	.28	.06	.17 [¶]	.000	.03	.03	.03	20.00 [¶]
Step 2								
Degree Year	-.01	.01	-.02	.470	.03	.02	.00	.52
Step 3								
Income	-.17	.03	-.18 [¶]	.000	.06	.06	.03	20.78 [¶]
Step 4								
ARS	.36	.02	.37 [¶]	.000	.68	.68	.62	201.05 [¶]
IPCRS	.46	.02	.52 [¶]	.000				
TLRS	.02	.02	.02	.405				
EERS	-.01	.02	-.01	.526				
SARS	-.06	.02	-.07	.008				
FRS	.00	.02	.01	.667				

***N = 611**

[¶] p < 0.001

[¶] p < 0.01

Hierarchical regression analyses

The results of the hierarchical regression analysis indicated that in step 1, gender positively predicted and accounted for 3% of the variance ($p < .001$). In step 2, the degree year was not significant. In step 3, the family income positively predicted and accounted for 6% of the variance ($p < .001$). In step 4, the six stressors significantly accounted for an additional 68% of the variance ($p < .001$), with only ARS, IPCRS, and SARS positively predicting overall stress (Table 7).

To summarize, female students had a higher level of overall stress than male students. The students with lower family income have reported high overall stress and the students who reported high levels of ARS, IPCRS, and SARS, were more likely to be included in the high overall stress category.

Discussion

The current study generated the subscales by factor analysis. All the six subscales or factors under which different items were included had a good internal consistency with an overall Cronbach's alpha of 0.957 which explained a cumulative 51.98% variance. Sampling size was adequate for factor analysis and other statistical analysis as established with KMO, Bartlett's test of sphericity, and anti-image correlation. Overall, out of 611 students, 94.10% (575) were under stress, out of which 59.65% (343/575) students had high to severe stress. A total of 11.45% (70/611) were under severe stress, which is a serious concern. The major findings of this study are that female veterinary students experienced higher overall stress as well as stress due ARS and IPCRS when compared to male students. The students with lower family income (male and female) had reported significantly higher overall stress as well as stress due to FRS. ARS was found a major source of overall stress followed by other factors. The three factors of the questionnaire ARS, IPCRS and SARS positively predicted the overall stress ($p < 0.01$). Gender and family income also positively predicted the variance within overall stress.

Although there is no similar research on the pattern of items used in this study for measuring stress and to identify stressors among veterinary students for comparison, yet various studies abroad have assessed different parameters than ours. For instance, Williams et al. (2005), observed that more than 85% of veterinary students experienced academic-related stress, including academic and practical workload, which is in line with several other studies in various countries (Collins and Foote 2005; Nahm and Chun 2020; Wells et al. 2021) including current study. In a study of stress among medical students at Kolkata, India by Gupta et al. (2015) the authors reported that 91.1% of medical students experienced stress, and academic-related stressors were identified as a major source of stress for 94.9% of students, which is in line with our findings. The academic stressors mainly associated with overall stress mainly included heavy workload, rude behavior of college staff, ignorance, and biases by college/university administration. In a study conducted to assess depression and anxiety among veterinary students, Reisbig et al. (2012) reported that female students experienced higher levels of depression and academic stress as compared to male students, which is in line with our findings (Reisbig et al. 2012). The

academic performance of female students in developing countries like India plays a decisive role in higher education and career, which might create a pressure additional to regular convincing for getting married by parents which might affect their academics and other activities, and this can be the reason for high academic, inter or intrapersonal and conflict related stress and overall stress (Rentala et al. 2019).

The students with lower family income in this study experienced higher overall stress as well as family responsibility related stress, which might be attributed to additional family responsibilities and fear of failure to fulfil future expectations. The lower-middle-class family students also reported higher stress due to teaching and learning related stressors, social activities related stressors and exams and evaluation related stressors when compared with the students of the upper class or high-income families. The uncertainty of future career opportunities after graduation and lack of funds to continue the education might be the factors leading to stress in such students, evident from the finding that first year UG students reported higher stress due to family expectations related stressors.

The hierarchical regression analysis revealed that academics, inter or intrapersonal and career related, and social activities related stress positively predicted the overall stress for veterinary students in India. Thus, the focus can be emphasized on these factors to design coping strategies for stress management among veterinary students in India.

It is evident from findings of current and other studies that a high percentage of veterinary students are feeling stressed to a level that might impact their quality of life. The professional faculty in veterinary institutes has a responsibility to support students during their education and to prepare them for all aspects of professional life and they can help address this problem by educating with appropriate knowledge, fostering the development of necessary skills, and providing guidance and empathetic support when needed (Collins and Foote, 2005). The administration needs to be more accessible and empathetic towards students' problem rather than ignoring them. As much of the stress reported in the study arise from academic related stressors including heavy workload and intensive curriculum, there is an urgent need to introduce some newer changes to design more apt and less stressful curriculum.

The inclusion of workshops and meditation programs in veterinary curriculum for stress management might serve as guiding tool to balance the life and to raise awareness of individual needs (Collin and Foote, 2005). The cultural activities, sports activities and sessions as workshop seeking the feedback from the students from time to time might help to create a culture of inclusion, support, and acceptance.

The study found a higher number of students in severe overall stress which is a serious concern and needs immediate interventions to safeguard the mental health of such students. Veterinary students can self-evaluate their level of stress using this instrument, which might help them to seek early interventions. The construct designed and validated in this study can be used effectively with high consistency to measure the stress level among veterinary students in veterinary colleges or universities across India. To the best of our knowledge, this is the first study using a questionnaire survey designed and validated to map out the stress among veterinary students of India.

Limitation of the study

The low response rate from some of the veterinary colleges seems to limit the more accurate results, which could be obtained by involving every veterinary college/university in India. Further, the study was based on a single parameter of stress and other components such as anxiety and depression might be included in further studies. However, specific area selection bias can be there in the study, but sampling adequacy analysis and the first insight nature of the study might overcome that. Moreover, social desirability bias cannot be ignored but providing name was kept optional to reduce such bias.

Conclusion

High overall stress among veterinary students of India is a serious concern and most of this stress is due to various academic stressors which fulminate within the parameter of veterinary colleges/universities' campuses and classrooms. There is thus an urgent need to address such issues and to design coping strategies to minimize the stress among veterinary students. This study can be taken as a basis for further evaluation of stressors and the levels of stress among veterinary students of India. This study also showed that this construct with six factors had acceptable psychometric properties and is a valid and reliable instrument that can be used in local settings for the assessment of stress among veterinary students.

Declarations

Financial disclosures

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Ethics Approval

As written consent from all the participants was obtained before participating in the survey and all the participants had veterinary medical background no approval was sought from ethical committee.

Acknowledgments

The authors are highly thankful to the veterinary students at various colleges and states of India, who participated in the study.

Contributions:

Grakh K., Jadhav V.J., and Panwar, D. contributed to the conception and design of the study and questionnaire survey. Jadhav V.J., Grakh K., Panwar, D., Pandita S., and Yadav D. collected and organized the data. Grakh K., Jadhav V.J., Bangar Y.C., and Khurana R. analyzed and interpreted the data. Grakh K. wrote the initial draft of the manuscript, Jadhav V.J., and Khurana R. performed the critical revisions in the manuscript. All authors have critically reviewed and approved the final draft.

Declaration of Competing Interest

None.

Conflicts of interest

The authors declare that they have no conflicts of interests regarding publication, authorship order and any other aspect.

Data Availability

All the data related to this manuscript is already included within the text. Any additional data if needed can be collected from corresponding author on a reasonable request.

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Figures

Figure 1

Scree plot showing Eigen value of the factors generated