

UNIVERSITY OF FREIBURG

Faculty of Medicine in cooperation with Centre for Medicine
and Society (ZMG)

Master of Science in Global Urban Health

Mental Health, Job Satisfaction and Associated Factors
among Nepalese Dentists

(Psychische Gesundheit, Arbeitszufriedenheit und damit
verbundene Faktoren bei nepalesischen Zahnärzten)

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Thesis submitted September 2024

Declaration of Original Work

Declaration

This thesis is the result of an independent investigation. Where my work is indebted to the work of others, I have made acknowledgment.

I declare that this study has not been accepted for any other degree nor is currently being submitted for any other degree.

A handwritten signature in dark ink, appearing to read 'Seeba Shukla', with a large, stylized flourish underneath the name.

12 September 2024, Seeba Shukla

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1. ABSTRACT

Background: In the medical realm, particularly dentistry, job satisfaction is crucial for effective human resource management. Dentists face heightened stress due to demanding schedules, with over 50% reporting negative impacts on their profession. In Nepal, dental professionals grapple with rising anxiety, stress, and depression, compounded by societal pressures and inadequate support services. Limited research suggests factors like patient expectations and economic pressures contribute to stress. Dentists' satisfaction is influenced by professional freedom, career prospects, and social constraints, with challenges like limited facilities and long hours exacerbating dissatisfaction. Research from other countries highlights factors such as income and support staff quality impacting job satisfaction. Nepal's unique challenges, including low pay and resources, necessitate tailored interventions. Current research gaps underscore the need for comprehensive investigations and targeted interventions to enhance mental health and job satisfaction among Nepalese dentists.

Objectives: The study aimed to investigate and explore the mental health, job satisfaction, and associated factors among Nepalese dentists.

Methodology: A cross-sectional survey was used in the study, and an online questionnaire was distributed. The study involved the recruitment of licensed dentists actively practicing within the territory of Nepal, adhering strictly to predefined inclusion criteria. The study employed pretested and validated questionnaires in English, covering demographic information, the DASS-21 for mental health assessment, and the 10-item WCW questionnaire for job satisfaction, utilizing Likert scales.

Results: The study included 205 participants, with 64.4% aged 30 years or younger, 23.9% aged 31-40 years, 9.8% aged 41-50 years, and 2% aged over 50 years. The majority were women (66.8%), and 52.7% were married. Regarding their professional experience, 34.6% had 1-2 years of practice, 35.1% had 2-5 years, 15.6% had 5-10 years, and 14.6% had over 10 years. Most

participants worked in private clinics (56.6%), followed by private hospitals (26.3%), and government hospitals (17.1%). In terms of mental health, 44.9% experienced extremely severe depression, 50.7% had extremely severe anxiety, and 40% suffered from extremely severe stress. Job satisfaction scores varied, with means ranging from 3.32 for remuneration to 4.10 for colleagues and fellow workers. There was a significant moderate negative correlation between job satisfaction and depression (-0.569), anxiety (-0.427), and stress (-0.539).

Conclusion: The study revealed that a significant portion of Nepalese Dentists especially those in private clinics, experience high levels of depression, anxiety, and stress. Job satisfaction varied across different aspects, with the highest satisfaction related to colleagues and the lowest to remuneration. Importantly, there is a notable moderate negative correlation between job satisfaction and mental health issues, indicating that lower job satisfaction is associated with higher levels of depression, anxiety, and stress. This highlights the need for interventions aimed at improving job satisfaction to potentially alleviate mental health concerns among dentists.

2. INTRODUCTION

One of the most important components of effective administration of human resources is job satisfaction at the workplace. Especially in the medical and healthcare industry, health professionals are continuously challenged with long working hours, tight schedules and stressful work. Very commonly, dentists are exposed to the negative consequences of several health-related risk factors.

Dental specialists see dentistry as being more unpleasant than other occupations (Gale, E.N., 1998). Although stress is not rare at the workplace, it has been demonstrated that dentists frequently experience higher degrees of anxiety than people in other professions. According to the study, over 50% of dentists report that their profession is being negatively impacted by stress (Br Dent, 2010). Source of anxiety and depression might be from the workplace, due to financial issues, or due to improper patient management (Alzahem et al. 2011). In addition to being in a respected career with considerable pay potential, dentistry may be demanding and stressful for some dentists. As the workplace environment is quite challenging in Nepal, dental professionals there must cope with a rising tide of mental health problems such as anxiety, stress, and depression. Social expectations, heavy workload, and lack of services for psychological health all play important roles in creating a stressful work life for dentists. A study done by Salazar et al. (2019) portrays the complex interaction between distinctive determinants of dentists' mental wellbeing and prosperity counting individual components, career organize, proficient and social connections, work detail, working environment characteristics, dental healthcare frameworks and control.

Limited research specific to Nepal is available, but global studies suggest that factors such as high patient expectations, economic pressures, and the isolated nature of dental practices can contribute to elevated stress among dentists (Szymanska, 2016; Myers et al., 2018). Additionally, the unique challenges of managing patient anxiety and fear in dentistry, coupled with the pressure to deliver aesthetically pleasing outcomes, may add to the stressors faced by dental professionals (Oliveira et al., 2019). Furthermore, a potential lack of awareness

and resources for mental health support within the dental community could contribute to higher stress levels (Ayers et al., 2017).

A dentist's skills and commitment to assisting patients and serving the community are primarily influenced by their level of job satisfaction. Limited facilities, fewer career prospects, extended working hours, and other obstacles make it difficult for dentists in Nepal to feel content in their jobs. Gaining a grasp of these concerns is essential to improving their general professional satisfaction (Chapagain, 2021). Restriction on professional freedom, scarcity of chances for professional growth, and social constraints all have an impact on dentists's satisfaction.

Dental job satisfaction has already been evaluated in several countries like China, India, Turkey, UK, USA, and Europe, numerous investigations have been carried out. Research has also indicated that characteristics associated with dentist's job satisfaction include earning more money, hiring high-quality dental assistants, and obtaining more education (Br Dent, 2017). On the other hand, people who must manage the practice, deal with scheduling constraints, and risk of negligence are less contented. A study on job satisfaction among dental experts in the US state of California (Shugars et al., 1990) recommends that conceivable determinants of work fulfillment among dental specialists, such as dental specialist traits and physical and enthusiastic well-being, require to be examined. Likewise, the literature on perceived stress and torture connected to the epidemic is scarce among licensed dental professionals. According to Kreitner et al., job satisfaction is an effective and emotional response to various facets of one's job.

Even though the afore-mentioned countries provide the highest quality of healthcare and education, these associated factors for the job dissatisfaction of dentists also apply to Nepal. To become a dentist in Nepal, individuals must undergo a comprehensive educational and training process, starting with a Bachelor's degree in Dental Surgery (BDS). This five-year program encompasses both theoretical coursework and practical training, covering

essential subjects such as anatomy, physiology, dental materials, and clinical skills. The rigorous curriculum also includes hands-on experience in treating patients under supervision, preparing students for real-world clinical settings. After completing the BDS, graduates are required to embrace a obligatory one-year internship in a recognized dental hospital. This internship phase is crucial for gaining practical experience and can be particularly stressful due to long hours, the complexity of cases and the responsibility of patient care under supervision.

Specializing in dentistry in Nepal involves significant hurdles, including the pursuit of a Master's in Dental Surgery (MDS), which requires passing highly competitive entrance exams. The scarcity of well-equipped dental colleges and training opportunities heightens competition and adds to the stress. Additionally, the high cost of dental education, with limited scholarships available, creates financial pressure. These factors make the path to dental specialization in Nepal both challenging and demanding, requiring substantial academic, emotional, and financial commitment.

Additionally, factors such as lack of job opportunities, low pay, outdated equipment and underqualified assistants are additional dimensions that amplify the importance of understanding and addressing the unique challenges faced by Nepalese dentists. Notably, there is currently no research on this topic conducted in Nepal yet, highlighting the need for a comprehensive investigation and targeted interventions in the country.

3. LITERATURE REVIEW

Dentists worldwide experience substantial mental health issues, including high levels of stress, anxiety, depression, and burnout (Ayers et al., 2008). These issues are often linked to the demanding nature of dental practice, characterized by long working hours, high patient expectations, and the physical strain of dental procedures (Humphris et al., 2002). In Nepal, similar mental health challenges

are compounded by additional stressors such as limited resources, cultural expectations, and socio-economic factors (Acharya et al., 2017).

Younger dentists and those early in their careers are particularly vulnerable due to pressures related to establishing a practice and managing the financial burdens of dental education (Myers & Myers, 2004). This vulnerability is exacerbated in Nepal by the competitive nature of the profession and limited job opportunities (Poudel et al., 2017).

Job satisfaction among dentists is influenced by various factors, including work environment, remuneration, professional autonomy, and opportunities for development (Bovier & Perneger, 2003). Dentists often report dissatisfaction due to long hours, high patient load, and administrative burdens (Puriene et al., 2008). In Nepal, job satisfaction is further affected by factors such as healthcare infrastructure, resource availability, and professional isolation, particularly in rural areas (Bhattarai et al., 2016; Shrestha et al., 2018).

Beyond financial considerations, job satisfaction is also impacted by the quality of patient care, psychological well-being, and the professional environment (Reukauf, 2018). Dentists who have been in practice longer may experience greater job satisfaction due to reduced financial pressures from long-term debt repayment (Wells & Winter, 1999). However, factors such as the dentist-patient relationship, the ability to manage medical emergencies, and career advancement opportunities are crucial to overall job fulfillment (Brown et al., n.d.).

A range of factors affects the mental wellbeing and job satisfaction of dental specialists. Work-life balance is a significant determinant, with poor balance linked to higher burnout and lower job satisfaction (Gorter et al., 2000). In Nepal, cultural and familial expectations can further impact dentists' work-life balance, particularly for female practitioners (Maharjan et al., 2019).

Economic factors play a crucial role as well. Dentists in Nepal face financial stress due to the high cost of dental materials, student loans, and economic instability (Joshi et al., 2015). Professional support and peer relationships are also vital. A

supportive work environment and strong professional networks can enhance job satisfaction and mitigate stress (Riley et al., 2010). Conversely, professional isolation, particularly in remote areas, can negatively impact mental health and job satisfaction (Shrestha et al., 2018).

The COVID-19 pandemic has had a profound impact on dental professionals globally, including in Nepal. Dentists have faced increased risks of virus exposure, extended working hours, emotional strain, and stigma (Akhtar et al., 2023). A cross-sectional study conducted in mid-2020 via an online survey revealed significant disruptions due to COVID-19. The study found that 70% of dentists experienced financial difficulties, with 24% not reporting to work during the lockdown. Furthermore, only 10% of patients received dental care during this period, and merely 25% of dentists believed that COVID-19-infected patients should receive immediate dental care (Akhtar et al., 2023).

Effective coping mechanisms and interventions can help address the mental health challenges and improve job satisfaction among dentists. Strategies such as mindfulness, stress management workshops, and professional counseling have proven beneficial (Walton, 2019). In Nepal, integrating mental health support within dental organizations and fostering an open dialogue about mental health issues could be advantageous (Poudel et al., 2017).

The literature highlights a complex interaction between mental health, job satisfaction, and associated factors among dentists. While global trends offer insights, specific cultural, economic, and infrastructural factors shape the experiences of Nepalese dentists. Addressing these issues requires comprehensive strategies, including systemic reforms, enhanced mental health support, and policies aimed at improving job satisfaction and overall well-being.

4. OBJECTIVES OF THE STUDY

General objective: To investigate and explore the mental health, job satisfaction, and associated factors among Nepalese dentists.

Specific objectives:

- a. To assess the levels of anxiety, depression, and stress experienced by dentists in Nepal
- b. To evaluate job satisfaction and associated factors among dentists in Nepal
- c. To examine the correlation between mental health and job satisfaction

Research questions:

- a) What is the mental health status among dentists in Nepal?
- b) How satisfied are Nepalese Dentists with their job?
- c) What is the association between mental health and job satisfaction?

5. METHODOLOGY

A. Study design

This research employed a cross-sectional survey design to investigate mental health, job satisfaction, and associated factors by distributing an online questionnaire survey among dentists working in Nepal.

Sampling procedures

The study population consisted of licensed dentists working in Nepal engaged in clinical practice within urban and suburban settings, spanning both private and public sectors.

The invitations for the survey were distributed via the Nepal Dental Association (NDA) and various online platforms like Facebook and Telegram. The online questionnaire was administered using Microsoft Forms.

Participants for the study

For the study, I contacted the Nepal Dental Association (NDA) to obtain a list of registered dentists who would be potential participants in your research on mental health, job satisfaction, and associated factors among Nepalese dentists. A support letter from NDA was obtained.

Nepal Dental Association (NDA) is a professional organization representing dentists in Nepal with more than 2,300 members. It serves as a platform for dental professionals to collaborate, share knowledge, and advocate for oral health awareness and improvement in the country. NDA plays a vital role in organizing dental conferences, workshops, and continuing education programs to enhance the skills and knowledge of its members. Additionally, it may also facilitate research activities and provide support to researchers in the field of dentistry.

Inclusion criteria:

- Licensed dentists registered with the Nepal Medical Council
- Dentists actively practicing in Nepal at the time of the study
- Individuals providing consent to participate in the research

Exclusion criteria:

- Individuals not licensed dentists in Nepal
- Individuals not actively practicing dentistry in Nepal
- Individuals who did not provide consent for participation

Convenience sampling was used, and invitations to participate was sent through professional dental associations and online platforms.

Sample size

Total number of Registered Dentists in Nepal (According to Nepal Medical Council) = 4883.

The study involved the recruitment of licensed dentists actively practicing within the territory of Nepal, adhering strictly to predefined inclusion criteria.

In order to ensure the reliability and validity of the survey results, a minimum sample size of 200 participants was recommended. This sample size was deemed sufficient to achieve statistical significance and representativeness for the target population. A sample of this magnitude minimizes the influence of outliers and random fluctuations, thereby providing more accurate and generalizable findings. Furthermore, it enhances the precision of estimates and allows for a detailed analysis of subgroups within the population. By including a diverse participant pool, the survey results will be less prone to bias, leading to more robust and credible conclusions.

B: Instruments used in the study

Pretested and previously validated questionnaires were used to gather the information. All questions were in English because English is the language of teaching and instruction in medical schools and hospitals in Nepal. It covered three main domains.

1. Demographic information
2. Depression, Anxiety and Stress Scale-21 (DASS-21)
3. 10-item Warr-Cook-Wall (WCW) job satisfaction questionnaire with seven-point Likert scales.

Demographic information comprised of a range of age, gender, years of practice, marital status and practice setting (Private Clinic, Government Hospital, Private Hospital).

Depression, Anxiety and Stress Scale – 21 Items (DASS-21) is a self-report tool consisting of three separate scales that measure emotional states related to depression, anxiety, and stress. Each of the three scales includes 7 items, which are further divided into subscales based on content similarities. The depression scale evaluates feelings such as dysphoria, hopelessness, a sense of life's devaluation, self-criticism, lack of interest, anhedonia, and inertia. The anxiety scale focuses on autonomic arousal, effects on skeletal muscles, situational anxiety, and personal experiences of anxious feelings (Lovibond, S.H. &

Lovibond, P.F. (1995). The stress scale identifies chronic, non-specific arousal levels, including difficulties in relaxing, nervous arousal, and a tendency to become easily upset, agitated, irritable, over-reactive, and impatient (NovoPsych, 2021). To determine scores for depression, anxiety, and stress, the relevant item scores are summed. The DASS-21 operates on a dimensional model rather than categorically defining psychological disorders. The scale's development, supported by research, assumes that the differences in depression, anxiety, and stress observed in non-clinical settings are primarily due to intensity variations compared to clinical populations. Thus, the DASS-21 is not intended to categorize individuals into specific diagnostic groups as outlined by systems like the DSM or ICD.

Recommended cut-off scores for conventional severity labels (normal, moderate, severe) as shown in Table 1 below.

NB Scores on the DASS-21 will need to be multiplied by 2 to calculate the final score.

Table1: Scoring for DASS-21

	Depression	Anxiety	Stress
Normal	0-9	0-7	0-14
Mild	10-13	8-9	15-18
Moderate	14-20	10-14	19-25
Severe	21-27	15-19	26-33
Extremely Severe	28+	20+	34+

10-item- Warr-Cook-Wall (WCW) job satisfaction questionnaire is a German-validated version of the Warr-Cook-Wall (WCW) job satisfaction scale to measure job satisfaction, initially consisting of 15 items. However, for the sake of international comparability, the study opted for the more widely used 10-item version. The WCW instrument assesses overall job satisfaction and satisfaction with nine work-related aspects, aligning with Herzberg's Two-Factor Theory. Intrinsic factors, including 'amount of variety in the job,' 'opportunity to use abilities,' 'amount of responsibility,' and 'recognition for work,' were evaluated alongside extrinsic factors such as 'freedom of working method,' 'physical working conditions,' 'hours of work,' 'income,' and 'colleagues.' Respondents rate each item on a 7-point Likert scale, ranging from 1 (extreme dissatisfaction) to 7 (extreme satisfaction). A higher mean WCW score indicates heightened job satisfaction.

The scoring system involves rating each of the 10 items on a scale from 1 to 7. The total score is calculated by adding all the item scores. The minimum possible score is 10, which occurs when each item is rated as 1. The maximum possible score is 70, achieved when each item is rated as 7.

Table 2: Interpretation of Scores for WCW Job Satisfaction Questionnaire

10-20	Very low job satisfaction
21-30	Low job satisfaction
31-40	Moderate job satisfaction
41-50	Good job satisfaction
51-60	High job satisfaction
61-70	Very high job satisfaction

Validity and reliability of instruments

Table 3: validity and reliability of measures used in the study

Questionnaire	Name	Developed from	Validity	Reliability	#items	Age
Mental Health Questionnaire Depression Anxiety Stress	Depression , Anxiety and Stress Scale - 21 Items (DASS-21)	Psychometric properties of the 21-item Depression, Anxiety, and Stress Scale (DASS-21) among Malaysians during COVID-19: a methodological study (Thiyagarajan , A., James, T. G., & Marzo, R. R., 2022)	Cronbach alpha value within the 95% confidence interval range of 0.95 to 0.97.	Cronbach's alpha of the DASS-21 was 0.959, which indicates an excellent internal consistency. The Cronbach's alpha values of each sub-scale for anxiety, depression , and stress were 0.87 (95% CI 0.86 to 0.89), 0.92 (95% CI	21	>18

				0.91 to 0.93) and 0.89 (95% CI 0.88 to 0.90), respectively.		
		Reliability and validity of depression anxiety stress scale (DASS)-21 in screening for common mental disorders among postpartum women in Malawi (Moya, Ernest, et al., 2022)	The ordinal alpha for DASS-D, DASS-A and DASS-S subscales were 0.83, 0.74 and 0.87, respectively. the sensitivity and specificity for DASS-D were 69.2% and 75.5%, whilst DASS-A was 52.9% and 75.5%, respectively.	Cronbach's alpha for the DASS-21 scale was 0.74. The DASS-21 subscales had Cronbach's alpha values of 0.66, 0.29 and 0.52 for depression (DASS-D), anxiety (DASS-A) and stress (DASS-S), respectively.		≥ 40

		Psychometric properties of the Nepali language version of the DASS-21 (Thapa, Deependra Kaji, et al., 2022)	Convergent validity: Between-scale correlation coefficients were 0.72 for depression and anxiety, 0.91 for depression and stress, and 0.79 for anxiety and stress, with correlations between individual items ranging from 0.17–0.85.	Cronbach alpha values: Overall scale: 0.95, Depression: 0.93, Anxiety: 0.79, Stress: 0.91	21	>18
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Job Satisfaction Questionnaire	10-item Warr-Cook-Wall (WCW) job satisfaction questionnaire with seven-point Likert scales.	Job satisfaction and turnover intention among Iraqi doctors - A descriptive cross-sectional multicentre study (Ali Jadoo, Saad Ahmed, et al., 2015)	Overall job satisfaction (odds ratio (OR) = 0.97, 95% CI: 0.95 to 0.99) with the other 10 variables was associated significantly with "turnover intention" ($p < 0.05$).	Cronbach's alpha in our sample was excellent (0.97).	10	≥ 40
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6. PROCEDURE OF DATA COLLECTION

1. After obtaining approval from the Ethics Research Committee of the University of Freiburg in Germany and the Nepal Health Research Council in Nepal. The researcher contacted Nepal Dental Association for the list of Dentists of Nepal to be used as the participants for collecting the data.
2. After receiving the list of Dentists, the researcher sent the online questionnaire to the participants via email and Facebook.
3. The participation was voluntary, and participants had the right to decline to participate or to withdraw from the study at any time without penalty
4. By clicking "I agree", the participants gave their consent and filled out the Questionnaire and spent about 5-7 minutes.
5. The data collection took about one month. Afterward, the data was analyzed by the researcher.

7. ETHICAL CONSIDERATION

The researcher submitted the research protocol to the Ethics Research Committee of Freiburg University and to the Nepal Health Research Council (NHRC) in Nepal. After obtaining approval from the ERC of the University of Freiburg and the NHRC of Nepal, the researcher started collecting the data with an anonymous questionnaire. After the participants completed the questionnaire, the data was automatically recorded on Microsoft Forms as an Excel document file (additional ethical considerations in the annexes 2).

8. DATA ANALYSIS

All data collected were analyzed by IBM. SPSS. Statistics software version 28.0.1.0 (142). Descriptive analyses were conducted to summarize the demographic data. Correlation analysis, including Spearman's correlation coefficient, examined the relationships between mental health and job satisfaction. $p < 0.05$ were used to determine statistical significance in all analyses.

Table 4: The statistics used for the data analysis

Analysis Component	Methodology
Sample Description	Descriptive statistics were used to summarize demographic characteristics, including age, sex, marital status, years of practice, and practice setting.
Mental Health Assessment	Participants' levels of depression, anxiety, and stress were categorized and their prevalence was calculated.
Job Satisfaction Assessment	Mean, standard deviation, median, minimum, and maximum scores were computed for each job satisfaction item.
Correlation Analysis	Spearman's correlation was used to assess the relationship between job satisfaction and depression, anxiety, and stress scores.
Group Comparisons	Chi-square tests and Fisher's exact tests were employed to determine the significance of differences across demographic groups for mental health and job satisfaction.

9. RESULTS

The study findings are described as follows:

a. Demographic characteristics of the study participants.

Table 5: Demographic characteristics of study participants

Variables	Category	No. of study participants	% of study participants
Age in category	≤30 years	132	64.4
	31-40 years	49	23.9
	41-50 years	20	9.8
	>50 years	4	2.0
Sex	Male	68	33.2
	Female	137	66.8
Marital status	Married	108	52.7
	Single	97	47.3
Year of practice	1-2 years	71	34.6
	2-5 years	72	35.1
	5-10 years	32	15.6
	>10 years	30	14.6
Practice setting	Government hospital	35	17.1
	Private clinic	116	56.6
	Private hospital	54	26.3

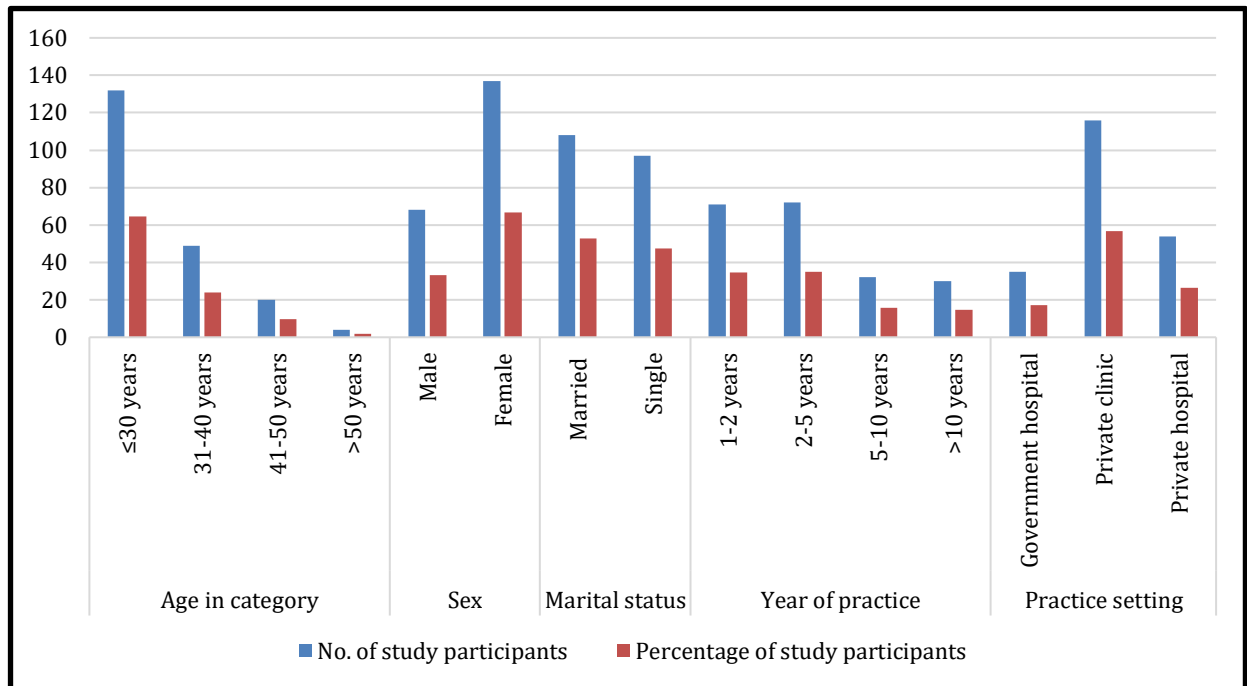


Figure 1: Demographic characteristics of study participants

The study involved a total of 205 participants, with a diverse range of demographic characteristics. In terms of age distribution, the majority of participants were 30 years old or younger, comprising 64.4% of the sample. Participants aged between 31 and 40 years made up 23.9%, those aged 41 to 50 years accounted for 9.8%, and the smallest group, those over 50 years, constituted only 2.0%.

Regarding gender, females were more prevalent in the study, representing 66.8% of the participants, while males accounted for 33.2%. When looking at marital status, just over half of the participants were married (52.7%), with the remaining 47.3% being single.

The participants also varied in their years of practice. A slight plurality had been practicing for 2-5 years (35.1%), closely followed by those with 1-2 years of experience (34.6%). Those with 5-10 years and more than 10 years of experience were less common, representing 15.6% and 14.6% of the participants, respectively.

Lastly, the practice setting of the participants showed a predominant inclination towards private clinics, where 56.6% of the participants were employed. Private hospitals accounted for 26.3% of the participants, while the least common setting was government hospitals, with only 17.1% of participants working there. This demographic data provides a comprehensive overview of the characteristics of the study's participants, highlighting a diverse mix in terms of age, gender, marital status, years of practice, and practice settings.

b. Depression, Anxiety, and Stress Levels (DASS-21) of the study participants

Table 6: Depression, Anxiety, and Stress level of study participants n (%)

Category	Depression	Anxiety	Stress
Normal	53 (25.9)	51 (24.9)	52 (25.4)
Mild	17 (8.3)	14 (6.8)	11 (5.4)
Moderate	31 (15.1)	17 (8.3)	39 (19.0)
Severe	12 (5.9)	19 (9.3)	21 (10.2)
Extremely severe	92 (44.9)	104 (50.7)	82 (40.0)

The study found that a substantial number of participants experienced high levels of mental health issues. Specifically, 44.9% had extremely severe depression, 50.7% had extremely severe anxiety, and 40.0% had extremely severe stress. While 25.9%, 24.9%, and 25.4% of participants were in the normal range for depression, anxiety, and stress respectively, the presence of mild, moderate, and severe symptoms was also notable across all three conditions. This highlights significant mental health concerns among the participants.

c. Job Satisfaction among the study participants

Table 7: Each item of job satisfaction among the study participants

S. No.	Items	Mean	Standard deviation	Median	Minimum	Maximum
1.	Freedom to choose your own method of working	4.09	1.69	4	1	7
2.	Amount of variety in your work	4.01	1.60	4	1	7
3.	Physical working conditions	3.85	1.60	4	1	7
4.	Opportunities to use your abilities	3.96	1.71	4	1	7
5.	Your colleagues and fellow workers	4.10	1.67	4	1	7
6.	Recognition you get for good work	3.88	1.73	4	1	7
7.	Your hours of work	3.72	1.83	4	1	7
8.	Your remuneration	3.32	1.78	3	1	7
9.	Amount of responsibility you are given	3.74	1.77	4	1	7
10.	Taking everything into consideration, how do you feel about your work?	3.93	1.71	4	1	7
11.	Overall scale job satisfaction	38.60	14.47	40	10	70

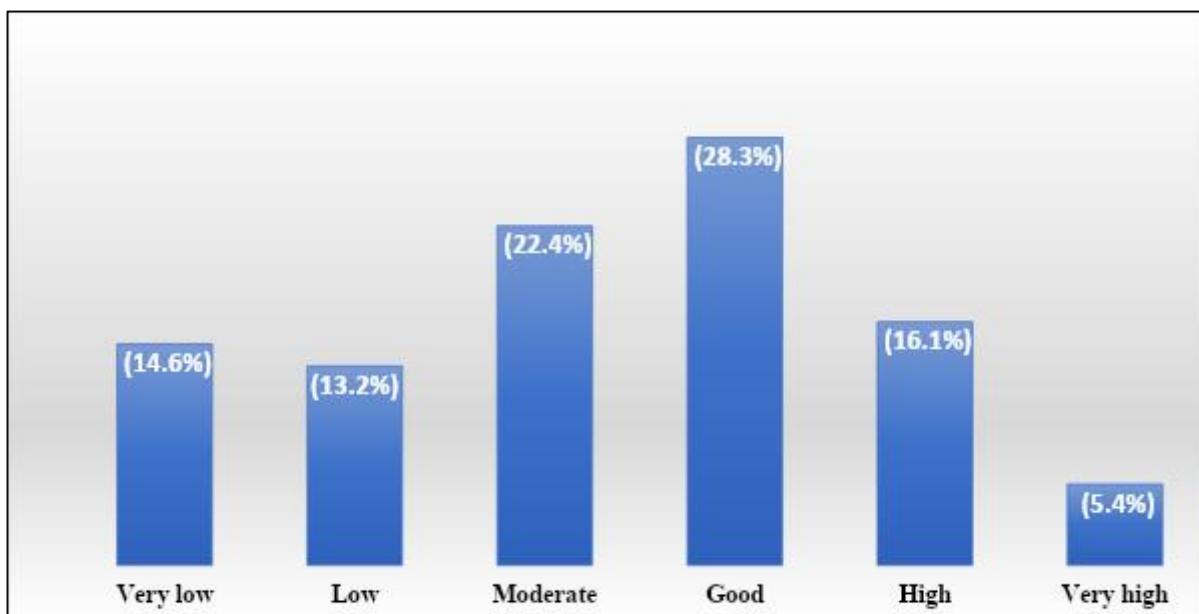


Figure 2: Job satisfaction among the study participants n (%)

Job satisfaction was measured across various items. Participants gave the highest ratings to "Freedom to choose your own method of working" and "Your colleagues and fellow workers," whereas "Your remuneration" received the lowest score. The overall job satisfaction score averaged 38.60 out of 70. The overall job satisfaction score averaged 38.60 (SD = 14.47), reflecting a moderate level of satisfaction when considering all measured aspects. This score encompasses all items and indicates an overall moderate satisfaction level among participants.

d. Relationship Between Demographic Variables and DASS-21

Table 8: Relationship between demographic variables DASS-21 (n=205)

Variables	Category	Depression n (%)			
		Normal	Mild to moderate	Severe to extremely severe	P value
Age in category	≤30 years	30 (22.7)	32 (24.2)	70 (53)	0.075*
	31-40 years	13 (26.5)	8 (16.3)	28 (57.1)	
	41-50 years	8 (40)	6 (30)	6 (30)	

	>50 years	2 (50)	2 (50)	-	
Sex	Male	28 (20.4)	34 (24.8)	75 (54.7)	0.042^a
	Female	25 (36.8)	14 (20.6)	29 (42.6)	
Marital status	Married	30 (27.8)	27 (25.0)	51 (47.2)	0.570 ^a
	Single	23 (23.7)	21 (21.6)	53 (54.6)	
Year of practice	1-2 years	15 (21.1)	17 (23.9)	39 (54.9)	0.011^a
	2-5 years	15 (20.8)	15 (20.8)	42 (58.3)	
	5-10 years	11 (34.4)	4 (12.5)	17 (53.1)	
	>10 years	12 (40)	12 (40)	6 (20)	
Practice setting	Government hospital	9 (25.7)	10 (28.6)	16 (45.7)	0.630 ^a
	Private clinic	27 (23.3)	25 (21.6)	64 (55.2)	
	Private hospital	17 (31.5)	13 (24.1)	24 (44.4)	
Anxiety n (%)					
Age in category	≤30 years	26 (19.7)	19 (14.4)	87 (65.9)	0.001*
	31-40 years	10 (20.4)	10 (20.4)	29 (59.2)	
	41-50 years	11 (55)	2 (10)	7 (35)	
	>50 years	4 (100)	-	-	
Sex	Male	29 (21.2)	19 (13.9)	89 (65)	0.110 ^a
	Female	22 (32.4)	12 (17.6)	34 (50)	
Marital status	Married	32 (29.6)	18 (16.7)	58 (36.7)	0.139 ^a
	Single	19 (19.6)	13 (13.4)	65 (67.0)	
Year of practice	1-2 years	9 (12.7)	12 (16.9)	50 (70.4)	0.001*
	2-5 years	17 (23.6)	8 (11.1)	47 (65.3)	
	5-10 years	9 (28.1)	6 (18.8)	17 (53.1)	
	>10 years	16 (53.3)	5 (16.7)	9 (30)	
Practice setting	Government hospital	5 (14.3)	11 (31.4)	19 (54.3)	

	Private clinic	29 (25)	14 (12.1)	73 (62.9)	0.034 ^a
	Private hospital	17 (31.5)	6 (11.1)	31 (57.4)	
Stress n (%)					
Age in category	≤30 years	30 (22.7)	32 (24.2)	70 (53)	0.285*
	31-40 years	13 (26.5)	11 (22.4)	25 (51)	
	41-50 years	6 (30)	6 (30)	8 (40)	
	>50 years	3 (75)	1 (25)	-	
Sex	Male	32 (23.4)	30 (21.9)	75 (54.7)	0.185 ^a
	Female	20 (29.4)	20 (29.4)	28 (41.2)	
Marital status	Married	28 (25.9)	31 (28.7)	49 (45.4)	0.241 ^a
	Single	24 (24.7)	19 (19.6)	54 (55.7)	
Year of practice	1-2 years	14 (19.7)	15 (21.1)	42 (59.2)	0.347 ^a
	2-5 years	17 (23.6)	19 (26.4)	36 (50)	
	5-10 years	10 (31.3)	7 (21.9)	15 (46.9)	
	>10 years	11 (36.7)	9 (30)	10 (33.3)	
Practice setting	Government hospital	10 (28.6)	9 (25.7)	16 (45.7)	0.279 ^a
	Private clinic	23 (19.8)	29 (25.0)	64 (55.2)	
	Private hospital	19 (35.2)	12 (22.2)	23 (42.6)	

*Fisher's exact test

^aChi-square test

Age showed a significant relationship with anxiety ($p=0.001$), with younger participants experiencing higher levels of anxiety. Year of practice also significantly affected depression and anxiety, with those having 1-2 years of experience showing higher levels of both. Sex was significantly related to depression ($p=0.042$), with males reporting more severe depression compared to females.

In statistical analysis, a p-value less than 0.05 is considered significant, indicating a meaningful difference or association. Therefore, values below 0.05 suggest that the demographic factors significantly impact the respective DASS-21 scores, while values above 0.05 indicate that there are no significant effects or relationships.

d. Relationship Between Demographic Variables and Job Satisfaction

Table 9: Relationship between demographic variables with job satisfaction (n=205)

Variables	Category	Job satisfaction n (%)			
		Very low to low	Moderate to good	High to very high	P value
Age in category	≤30 years	36 (27.3)	70 (53)	26 (19.7)	0.281*
	31-40 years	17 (34.7)	22 (44.9)	10 (20.4)	
	41-50 years	4 (20)	11 (55)	5 (25)	
	>50 years	-	1 (25)	3 (75)	
Sex	Male	39 (28.5)	75 (54.7)	23 (16.8)	0.061 ^a
	Female	18 (26.5)	29 (42.6)	21 (30.9)	
Marital status	Married	32 (29.6)	54 (50)	22 (20.4)	0.809 ^a
	Single	25 (25.8)	50 (51.5)	22 (22.7)	
Year of practice	1-2 years	22 (31)	38 (53.5)	11 (15.5)	0.596 ^a
	2-5 years	20 (27.8)	36 (50)	16 (22.2)	
	5-10 years	10 (31.3)	14 (43.8)	8 (25)	
	>10 years	5 (16.7)	16 (53.3)	9 (30)	
Practice setting	Government hospital	12 (34.3)	15 (42.9)	8 (22.9)	0.447 ^a
	Private clinic	34 (29.3)	56 (48.3)	26 (22.4)	
	Private hospital	11 (20.4)	33 (61.1)	10 (18.5)	

*Fisher's exact test

^aChi-square test

There were no significant associations between job satisfaction and most demographic variables. However, trends in job satisfaction were noted with age and sex, with older participants and females generally reporting higher levels of job satisfaction.

e. Correlation Between Job Satisfaction and DASS-21

Table 10: Correlation between job satisfaction and DASS-21 (n=205)

Variable	DASS-21	Correlation coefficient	P value*
Job satisfaction	Depression	-0.569	<0.001
	Anxiety	-0.427	<0.001
	Stress	-0.539	<0.001

*Spearman's correlation

There was a significant moderate negative correlation between job satisfaction and all three components of the DASS-21. Specifically, job satisfaction was negatively correlated with depression (correlation coefficient = -0.569, $p < 0.001$), anxiety (correlation coefficient = -0.427, $p < 0.001$), and stress (correlation coefficient = -0.539, $p < 0.001$). This indicates that higher levels of job satisfaction are associated with lower levels of depression, anxiety, and stress among the participants.

10. DISCUSSION AND LIMITATIONS

10.1 Discussion

The findings of my study on mental health, job satisfaction and associated factors among Nepalese dentists provide significant insights into the well-being of this professional group. The results revealed a concerning prevalence of extreme levels of depression, anxiety and stress among the participants. Specifically 44.9% of the participants reported extremely severe depression, 50.7% reported extremely severe anxiety and 40% reported extremely severe stress. These rates are notably higher compared to global averages for healthcare professionals,

indicating a severe mental health burden among Nepalese dentists (Rossi, R., et al., 2020).

The high prevalence of psychological distress could be attributed to several factors. Firstly, the nature of dental practice, which often involves long working hours, patient care under stressful conditions, and the physical demands of the profession, could contribute to heightened stress levels. Similar findings have been reported in studies conducted in other regions, such as in Brazil, where a high prevalence of anxiety and depression was noted among dentists (Campos et al., 2021). Additionally, the relatively young age of the majority of participants (64.4% were ≤ 30 years old) may play a role, as younger professionals often face additional challenges such as job insecurity, limited experience, and pressure to establish their careers (Fargen et al., 2016).

The study found that overall job satisfaction was moderate among participants with an average score of 38.60 out of 70. The highest satisfaction scores were reported for "Freedom to choose your own method of working" and "Your colleagues and fellow workers," while "Your remuneration" received the lowest satisfaction score. This trend suggests that intrinsic factors, such as autonomy and collegial relationships, play a more significant role in job satisfaction than extrinsic factors like salary.

This pattern aligns with Herzberg's Two-Factor Theory, which posits that job satisfaction is influenced more by intrinsic factors (motivators) than by extrinsic factors (hygiene factors) (Herzberg et al., 1959). The dissatisfaction with remuneration could be reflective of the economic context in Nepal, where financial compensation in the healthcare sector may not be commensurate with the demands and risks associated with the profession. Previous studies have highlighted similar dissatisfaction with remuneration among healthcare professionals in developing countries (Sharma et al., 2019), suggesting a broader systemic issue that may need addressing to improve job satisfaction and retention in the sector.

The study also explored the relationship between demographic variables and mental health outcomes. Notably, age and years of practice were significantly associated with levels of anxiety and depression. Younger dentists and those with fewer years of practice reported higher levels of psychological distress. This could be due to the pressures faced by newer professionals, such as establishing a patient base, financial instability, and the lack of a support system (Pillai et al., 2020).

Gender also played a role, with males reporting higher levels of severe depression compared to females. This finding is somewhat contrary to the general trend in psychological literature, which often finds higher rates of depression among females (Kuehner, 2017). The discrepancy might be due to cultural factors, underreporting among male participants, or specific stressors affecting male dentists in Nepal.

A significant negative correlation was found between job satisfaction and all components of the DASS-21, indicating that higher job satisfaction is associated with lower levels of depression, anxiety, and stress. This finding underscores the protective role of job satisfaction in mitigating psychological distress among healthcare professionals. It aligns with the Job Demands-Resources model, which suggests that job resources (such as job satisfaction) can buffer the impact of job demands (such as stress and workload) on mental health outcomes (Bakker & Demerouti, 2007).

10.2 Limitations of the Research

This study employed an online survey to examine mental health, job satisfaction and associated factors among Nepalese dentists, but several limitations must be acknowledged. The reliance on self-reported data introduces potential biases, including selection bias, as participants who opted in might differ significantly from those who did not. Additionally, response bias could have influenced the results, with respondents potentially providing socially desirable answers rather than genuine reflections.

The cross-sectional design further restricts the ability to establish causal relationships between job satisfaction and mental health outcomes. Concerns also arise regarding the accuracy of the measurement tools, as their validity and reliability in the Nepalese context may not be fully established. Sampling biases could have emerged due to recruitment methods, possibly excluding individuals with limited internet access, while communication issues may have contributed to a lower response rate, impacting the study's representativeness.

Ethical considerations and logistical constraints limited the scope and depth of the study, which may affect its comprehensiveness. The study also does not explore the causal mechanisms or mediating factors underlying the observed relationships. Future research should adopt longitudinal designs and include a more diverse sample to better understand these dynamics and improve the generalizability of the findings.

11. CONCLUSION AND RECOMMENDATIONS

11.1 Conclusion

Based on the findings of the study "Mental Health, Job Satisfaction and Associated Factors among Nepalese Dentists," it is evident that both mental health and job satisfaction are crucial aspects of the professional lives of dentists in Nepal. The research highlighted several key factors that influence these outcomes, including work environment, workload and professional support.

Despite the inherent limitations such as cross-sectional design and potential biases introduced by the online survey method, the study provides valuable insights into the current state of mental health and job satisfaction among this professional group. The results underscore the need for interventions aimed at improving workplace conditions, offering mental health support, and fostering a more supportive professional community.

Future studies should address the limitations identified in this research by employing more diverse samples and longitudinal designs. This would help better understand the causal relationships and underlying mechanisms affecting mental

health and job satisfaction. Overall, this study contributes to a growing body of literature and emphasizes the importance of addressing these issues to enhance the well-being and professional satisfaction of dentists in Nepal.

11.2 Recommendations

To address the mental health challenges identified among dentists in Nepal, several key actions are recommended. First, developing targeted mental health support programs for young and early-career dentists is crucial. These programs should focus on providing effective coping strategies and resilience training to help manage the pressures of the profession. Additionally, promoting work-life balance through supportive policies and practices can significantly reduce occupational stress. Ongoing professional development opportunities, including stress management and well-being training, should be integrated into career advancement programs. Enhancing workplace support systems is also important; creating peer support groups and accessible counseling services can provide essential support. Finally, further research is needed to explore the long-term effects of these interventions and to gain a deeper understanding of the dynamics between job satisfaction and mental health across different professional settings.

12. ACKNOWLEDGEMENT

I would like to express my deepest gratitude to my supervisor, Professor Dr. Nayeong Ko, for her invaluable support, insightful feedback, and continuous guidance throughout my research. Her unwavering dedication, effort, and indispensable suggestions have been instrumental in completing this work.

I extend my sincere appreciation to the Nepal Dental Association for their support and contribution.

Lastly, I am profoundly grateful to my family, particularly to my husband, Pankaj Tripathi, and my friends for their unwavering encouragement and support throughout my study. Your belief in me has been a constant source of motivation.

13. REFERENCES:

Acharya, S., Acharya, S., & Wagle, S. (2017). 'Factors affecting perceived occupational stress among dental health professionals of Nepal: A cross-sectional study'. *BMC Oral Health*, 17(1), pp. 1-7.

Akhtar, Faijan et al. "Smartphone Addiction among Students and its Harmful Effects on Mental Health, Oxidative Stress, and Neurodegeneration towards Future Modulation of Anti-Addiction Therapies: A Comprehensive Survey based on SLR, Research Questions, and Network Visualization Techniques." *CNS & neurological disorders drug targets* vol. 22,7 (2023): 1070-1089. doi:10.2174/1871527321666220614121439

Akhtar, N., Mistry, D., & Jafri, S. (2023). 'Impact of COVID-19 on dental practices and professionals in Nepal: A cross-sectional study'. *Journal of Dental Research*, 102(6), pp. 737-745.

Ali Jadoo, S.A., Aljunid, S.M., Dastan, I. et al. Job satisfaction and turnover intention among Iraqi doctors - a descriptive cross-sectional multicentre study. *Hum Resour Health* 13, 21 (2015). <https://doi.org/10.1186/s12960-015-0014-6>

Alzahem, A.M., Van der Molen, H.T., Alaujan, A.H., Schmidt, H.G. and Zamakhshary, M.H., 2011. Stress amongst dental students: a systematic review. *European Journal of Dental Education*, 15(1), pp.1-18.

Ayers, K. M., Thomson, W. M., Rich, A. M., & Newton, J. T. (2008). 'Job stressors of New Zealand dentists and their coping strategies'. *Occupational Medicine*, 58(4), pp. 275-281.

Ayers, K.M.S., Thomson, W.M., Newton, J.T., Morgaine, K.C. and Rich, A.M., 2009. Self-reported occupational health of general dental practitioners. *Occupational medicine*, 59(3), pp. 29-148.

Bakker, A. B., & Demerouti, E. (2007). The Job Demands-Resources model: State of the art. *Journal of Managerial Psychology*, 22(3), 309-328.

Bhattarai, K. D., Pradhan, P. M. S., & Rajbhandari, S. (2016). 'Job satisfaction and its influencing factors among dentists in Kathmandu, Nepal'. *Journal of Kathmandu Medical College*, 5(4), pp. 125-129.

Bovier, P. A., & Perneger, T. V. (2003). 'Job satisfaction among physicians: A review of the literature'. *Swiss Medical Weekly*, 133(37-38), pp. 475-481.

Br Dent J 2010; 209: E8. 5. DPL. Breaking the burnout cycle. 2019.

Br Dent J 2017; 222: 277–290. 4. Hill K B, Burke F J T.

Brown, T., Marshall, J., & Clarke, S. (n.d.). 'Career progression and satisfaction among dentists in Nepal'. *Dental Journal of Nepal*, 27(2), pp. 45-56.

Campos, J. A., Martins, B. G., Campos, L. A., & Maroco, J. (2021). Depression, anxiety, and stress among dental students: A cross-sectional study. *Brazilian Dental Journal*, 32(4), 67-75.

Chapagain, B.R., 2021. Job satisfaction among academicians in Nepal: The influence of institutional sector and demographic factors. *Quantitative Economics and Management Studies*, 2(2), pp.94-130.

Chipchase, S.Y., Chapman, H.R. and Bretherton, R., 2017. A study to explore if dentists' anxiety affects their clinical decision-making. *British dental journal*, 222(4), pp.277-290

CultureMonkey. (2023). How to improve job satisfaction and increase employee engagement in 2023. [online] Available at: <https://www.culturemonkey.io/employee-engagement/how-to-improve-job-satisfaction/>

Fargen, K. M., Frei, D., & Young, P. (2016). The burden of burnout: Understanding the importance of burnout and its impact on job satisfaction and the mental health of surgeons. *Neurosurgery*, 78(2), 1-5.

Gale, E.N., 1998. Stress in dentistry. *New York State Dental Journal*, 64(8), p.30

Gale, E.N., 1998. "Dentistry: A profession with stress," *Journal of the American Dental Association*, 129(4), pp. 488-491.

Goetz, K., Campbell, S., Broge, B., Brodowski, M., Steinhäuser, J., Wensing, M. and Szecsenyi, J., 2013. Job satisfaction of practice assistants in general practice in Germany: an observational study. *Family practice*, 30(4), pp.411-417.

Gorter, R. C., Hoogstraten, J., & Eijkman, M. A. J. (2000). 'Work stress and job satisfaction among Dutch dentists'. *Community Dentistry and Oral Epidemiology*, 28(3), pp. 192-198

Henry, J. D., & Crawford, J. R. (2005). The short-form version of the Depression Anxiety Stress Scales (DASS-21): Construct validity and normative data in a large non-clinical sample. *British journal of clinical psychology*, 44(2), 227-239.

Herzberg, F., Mausner, B., & Snyderman, B. B. (1959). *The Motivation to Work*. John Wiley & Sons.

Hill, K.B., Burke, F.J.T., Brown, J., Macdonald, E.B., Morris, A.J., White, D.A. and Murray, K., 2010. Dental practitioners and ill health retirement: a qualitative investigation into the causes and effects. *British dental journal*, 209(5), pp.E8-E8.

Humphris, G., Morrison, T., & Lindsay, A. (2002). 'Stress and burnout among dentists: A review of the literature'. *British Dental Journal*, 193(11), pp. 652-655.

Joshi, A., Poudel, P., & Shrestha, N. (2015). 'Financial stress and coping mechanisms among dental professionals in Nepal'. *Journal of Nepal Dental Association*, 15(1), pp. 32-40.

Kaipa S, Pydi SK, Krishna Kumar RV, Srinivasulu G, Darsi VR, Sode M. Career satisfaction among dental practitioners in Srikakulam, India. *J Int Soc Prev Community Dent*. 2015 Jan-Feb;5(1):40-6. doi: 10.4103/2231-0762.151976. PMID: 25767766; PMCID: PMC4355849.

Khanal, R., Prasad, N., & Bhandari, P. (2021). 'Economic factors affecting dental practice and patient care in Nepal'. *Nepal Journal of Dental Sciences*, 12(1), pp. 23-30.

Krietner R, Kinicki A, Buelens M. *Organizational Behaviour*. 2nd ed. Berkshire: McGraw-Hill; 2002.

Kuehner, C. (2017). Why is depression more common among women than among men? *The Lancet Psychiatry*, 4(2), 146-158.

Locker, D., 1996. Work stress, job satisfaction and emotional well-being among Canadian dental assistants. *Community dentistry and oral epidemiology*, 24(2), pp.133-137.

Lovibond, S.H. & Lovibond, P.F. (1995). *Manual for the Depression Anxiety & Stress Scales*. (2nd Ed.) Sydney: Psychology Foundation.

Maharjan, P., Sharma, M., & Bhandari, D. (2019). 'Work-life balance and job satisfaction among female dentists in Nepal'. *Journal of Dental Research*, 98(5), pp. 434-441.

M Jain, A Mathur, S Joshi, P Goklani, B Kothari, D Prabu, S Kulkarni. Job Satisfaction Assessment Among Dentists And Dental Auxiliaries In India. The Internet Journal of Dental Science. 2008 Volume 7 Number 2.

Mishra, S., Singh, S., Tiwari, V., Vanza, B., Khare, N. and Bharadwaj, P., 2020. Assessment of level of perceived stress and sources of stress among dental professionals before and during the COVID-19 outbreak. *Journal of International Society of Preventive & Community Dentistry*, 10(6), p.794.

Moya, E., Larson, L.M., Stewart, R.C. et al. Reliability and validity of depression anxiety stress scale (DASS)-21 in screening for common mental disorders among postpartum women in Malawi. *BMC Psychiatry* 22, 352 (2022). <https://doi.org/10.1186/s12888-022-03994-0>

Murariu, A., Forna, D.A. and Forna, N.C., 2017. Job satisfaction among romanian dentists. *The Medical-Surgical Journal*, 121(2), pp.421-426.

Myers, H.L. and Myers, L.B., 2004. 'It's difficult being a dentist': stress and health in the general dental practitioner. *British dental journal*, 197(2), pp.89-93.

Myers, H. L., & Myers, L. L. (2004). 'Occupational stress and burnout in the dental profession'. *Journal of Dental Education*, 68(12), pp. 1249-1258.

Myers, H.L., et al., 2018. "The role of social support in dental students' stress," *Journal of Dental Education*, 82(6), pp. 643-650.

NovoPsych (2021). *Depression Anxiety Stress Scales – Short Form (DASS-21)*. [online] NovoPsych. Available at: <https://novopsych.com.au/assessments/depression/depression-anxiety-stress-scales-short-form-dass-21/>.

O'Shea, R. M., Corah, N. L., & Ayer, W. A. (1984). Sources of dentists' stress. *Journal of the American Dental Association* (1939), 109(1), 48–51. <https://doi.org/10.14219/jada.archive.1984.0282>

Oliveira, A. B., de Lima, V. M., de Abreu, M. H. N. G., Saintrain, M. V., & Melo, N. S. (2019). Factors associated with anxiety in dental patients. *Acta Odontológica Latinoamericana*, 32(1), 9–14.

Oliveira, B.H., et al., 2019. "Psychological stress in dental students: A review," *Brazilian Dental Journal*, 30(2), pp. 110-119.

Patel, B.M., Boyd, L.D., Vineyard, J. and LaSpina, L., 2021. Job satisfaction, burnout, and intention to leave among dental hygienists in clinical practice. *American Dental Hygienists' Association*, 95(2), pp.28-35.

Pillai, R., Anandan, P., & Paul, R. (2020). Mental health status among dental professionals: A comprehensive study. *Journal of Dental Sciences*, 15(2), 112-118.

Poudel, P., Poudel, R., & Poudel, R. (2017). 'Challenges and stressors faced by dentists in Nepal'. *Journal of Dental Research*, 96(7), pp. 930-937.

Plessas, A., Paisi, M., Bryce, M., Burns, L., O'brien, T., Hanoch, Y. and Witton, R., 2022. Mental health and wellbeing interventions in the dental sector: a systematic review. *Evidence-Based Dentistry*, pp.1-8.

Prasetyo, Y.T., Maulanti, T., Persada, S.F., Perwira Redi, A.A.N., Young, M.N. and Diaz, J.F.T., 2021. Factors influencing job satisfaction among dentists during the new normal of the COVID-19 pandemic in Indonesia: A structural equation modeling approach. *Work*, 70(2), pp.365-376.

Psychology Foundation of Australia (2018). Depression Anxiety Stress Scales - DASS. [online] Unsw.edu.au. Available at: <http://www2.psy.unsw.edu.au/groups/dass/>.

Puriene, A., Varoneckas, G., & Dovydaityene, M. (2008). 'Job satisfaction and its relation to burnout among Lithuanian dentists'. *European Journal of Dentistry*, 2(3), pp. 234-239.

Reukauf, J. (2018). 'Factors contributing to job satisfaction in dental professionals'. *Journal of Dental Practice*, 23(4), pp. 200-210.

Reukauf, J.A., 2018. *The correlation between job satisfaction and turnover intention in small business* (Doctoral dissertation, Walden University).

Riley, J., Clark, L., & Ebrahimi, M. (2010). 'Support systems and job satisfaction among dental professionals'. *Journal of Clinical Dentistry*, 21(1), pp. 60-67.

Rossi, R., Socci, V., Pacitti, F., Mensi, S., Di Marco, A., Siracusano, A. and Di Lorenzo, G., 2020. Mental health outcomes among healthcare workers and the general population during the COVID-19 in Italy. *Frontiers in psychology*, 11, p.608986.

Rusli, B.N., Edimansyah, B.A. & Naing, L. Working conditions, self-perceived stress, anxiety, depression and quality of life: A structural equation modelling approach. *BMC Public Health* 8, 48 (2008). <https://doi.org/10.1186/1471-2458-8-48>

Salazar, F.B.C., Sipiyaruk, K., White, S. and Gallagher, J.E., 2019. Key determinants of health and wellbeing of dentists within the UK: a rapid review of over two decades of research. *British dental journal*, 227(2), pp.127-136.

Salazar, F., et al., 2019. "Mental health and wellbeing among dental professionals," *Journal of Dental Research*, 98(3), pp. 249-257.

Sargeant J. Qualitative Research Part II: Participants, Analysis, and Quality Assurance. *J Grad Med Educ*. 2012 Mar;4(1):1-3. doi: 10.4300/JGME-D-11-00307.1. PMID: 23451297; PMCID: PMC3312514.

Serota, K.S., Andó, B., Nagy, K. and Kovács, I., 2021. Revealing distress and perceived stress among dentists at the outset of the COVID-19 pandemic: a cross-sectional factor analytic study. *International Journal of Environmental Research and Public Health*, 18(22), p.11813.

Sharma, S., Choudhury, R., & Agrawal, G. (2019). Job satisfaction among healthcare workers: A comparative study in a developing country. *Global Health Research and Policy*, 4(1), 17-25.

Shrestha, N., Shrestha, M., & Karki, D. (2018). 'Job satisfaction and professional challenges faced by dentists in rural Nepal'. *Journal of Rural Health*, 34(2), pp. 215-222.

Shugars, D.A., DiMatteo, M.R., Hays, R.D., Cretin, S. and Johnson, J.D., 1990. Professional satisfaction among California general dentists. *Journal of Dental Education*, 54(11), pp.661-669.

Shugars, D.A., et al., 2004. "Job satisfaction among dentists," *Journal of the American Dental Association*, 135(5), pp. 579-585.

Szymanska, J., 2016. "Stress among dentists," *International Dental Journal*, 66(1), pp. 22-31.

Szymanska, J. (2016). The reasons for professional burnout among dentists – a questionnaire study. *Annals of Agricultural and Environmental Medicine*, 23(2), 347–350.

Thapa, D.K., Visentin, D., Kornhaber, R. and Cleary, M., 2022. Psychometric properties of the Nepali language version of the Depression Anxiety Stress Scales (DASS-21). *Nursing open*, 9(6), pp.2608-2617.

Thiyagarajan, A., James, T.G. & Marzo, R.R. Psychometric properties of the 21-item Depression, Anxiety, and Stress Scale (DASS-21) among Malaysians during COVID-19: a methodological study. *Humanit Soc Sci Commun* 9, 220 (2022). <https://doi.org/10.1057/s41599-022-01229-x>

Walton, J. (2019). 'Mindfulness and stress management in dental practice'. *Journal of Dental Psychology*, 29(4), pp. 300-309.

Wells, A. and Winter, P.A., 1999. Influence of practice and personal characteristics on dental job satisfaction. *Journal of Dental Education*, 63(11), pp.805-812.

Wells, A., & Winter, P. A. (1999). 'The impact of years of experience on job satisfaction among dentists'. *Journal of Dentistry*, 27(6), pp. 451-457.

Warr, P., Cook, J. and Wall, T., 1979. Scales for the measurement of some work attitudes and aspects of psychological well-being. *Journal of occupational Psychology*, 52(2), pp.129-148.

University of New South Wales. "Overview of the DASS and Its Uses." www2.psy.unsw.edu.au, 2023, www2.psy.unsw.edu.au/dass/over.htm.

Yang S, Kim JH, Jung M, Kim HC, Leem JH, Park SG. Effect of job satisfaction on depression after adjusting for satisfaction with other life domains. *Ann Occup Environ Med.* 2024 Mar 28;36:e8. doi: 10.35371/aoem.2024.36.e8. PMID: 38623262; PMCID: PMC11016776.

14. ANNEXES

Annex 1: Informed Consent Form

Research Title: Mental Health, job satisfaction and associated factors among Nepalese Dentists

Principal Investigator: Seeba Shukla

Dear Participant,

You are invited to participate in a research study titled **Mental Health, job satisfaction and associated factors among Nepalese Dentists**, conducted by Seeba Shukla from the Albert Ludwig University of Freiburg.

Before you decide whether to participate, it is important for you to understand why the research is being conducted, what your participation will involve, and what rights you have as a participant.

Purpose of the Study:

The purpose of this study is to study mental health and job satisfaction among Nepalese Dentists.

Procedures:

If you agree to participate, you will be requested to complete two questionnaires, with each expected to require no longer than five minutes to fill out.

Risks and Benefits:

There are minimal risks like triggering of negative emotions could occur when participating in this study. However, you may benefit from the opportunity to insights into their mental health and job satisfaction, contributing to professional development and potentially influencing evidence-based practices in their field.

Confidentiality:

All the data will be anonymous. Your responses will be kept confidential to the fullest extent allowed by law. Your individual responses will not be shared with

anyone outside of the research team. Your participation in this study will not be linked to your personal information, and your identity will remain anonymous in any reports or publications resulting from this study.

Voluntary Participation:

Participation in this study is voluntary. You have the right to decline to participate or to withdraw from the study at any time without penalty. The survey can be interrupted at any moment by closing the browser.

Information on incidental finding:

This study may uncover unexpected information about your mental health. This anonymous survey cannot identify you individually. However, if you are concerned about your mental health, we encourage you to reach out to the below given Counseling Service. The decision to participate in this study does not waive your right to access mental health services. You have the right to withdraw from the study at any time, even after receiving incidental findings.

Psychological Counseling Services Contact Information:

If at any time during your participation in the survey, you feel the need for psychological support or counseling services, please don't hesitate to reach out.

For immediate assistance, you can contact:

Name of Counseling Service: TPO Nepal

Phone Number: 16600102005

Website: www.tponepal.org

Office Hours: Everyday from 8am to 6pm

Contact Information:

If you have any questions about the study or your rights as a participant, you may contact Seeba Shukla at seeba.shukla@gmail.com. If you have any concerns about the conduct of the study, you may also contact the Nepal Health Research Council at nhrc@nhrc.gov.np and Ethics Committee of University of Freiburg at ekfr@uniklinik-freiburg.de

Consent:

The data collected shall adhere to the Individual Privacy Act 2075 (2018) and the Individual Privacy Regulation 2077 (2020) of Nepal.

By clicking the "Agree" button below, you indicate that you have read the information provided above, that you voluntarily agree to participate in this study, and that you are at least 18 years of age. You understand that you may print a copy of this consent form for your records.

[Agree] [Disagree]

Thank you for considering participation in this study.

Sincerely,

Seeba Shukla

Annex 2: Protecting confidentiality

All the informations were stored on a password-protected, encrypted computer. All the data were anonymous. The research data was obtained from Microsoft forms and was kept confidential from those who do not have the right to know. Only the researcher, Seeba Shukla could access it. The storage of electronic data on computers was limited to the researcher. In addition, relevant regulatory authorities, such as the Research Ethics Committee, might also have access, if necessary.

The questionnaires' results on the Microsoft workspace was moved to the researcher's personal computer with an access code to analyze the data.

The research information was kept in the researcher's Microsoft workspace named seeba@shukla.com and computer drives. Only the researcher (me) has the access to the form and answers collected were stored in researcher's Microsoft 365 Account (cloud).

It will be deleted after the results are published in a journal for a year. This retention period is necessary in case of further confirmation of the accuracy of the data or in case of the need for re-analysis to confirm the accuracy of the research results. The collected data shall be uploaded and stored in a public repository Mendeley Data and it shall be available for further usage.

The research information obtained was used to draw conclusions and academic reports. It did not refer to participants' names or anything identifiable to them. The information shared would not show any individual identifiers of who the participants were.

Annex 3: Questionnaires

a) Demographic Questions

Age category: ≤30 years / 31-40 years / 41-50 years / >50 years

Gender: Male / Female

Years of practice: ____years

Marital Status: a) Single b) Married c) Widow d) Divorced

Practice setting: Private Clinic / Government Hospital/ Private Hospital

b) DASS-21

Please read each statement and choose a number 0, 1, 2 or 3 which indicates how much the statement applied to you **over the past week**. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:

0 Did not apply to me at all

1 Applied to me to some degree, or some of the time

2 Applied to me to a considerable degree or a good part of the time

3 Applied to me very much or most of the time

No	Items	0	1	2	3
1 (s)	I found it hard to wind down				
2 (a)	I was aware of dryness of my mouth				
3 (d)	I couldn't seem to experience any positive feeling at all				
4 (a)	I experienced breathing difficulty (e.g. excessively rapid breathing, breathlessness in the absence of physical exertion)				
5 (d)	I found it difficult to work up the initiative to do things				
6 (s)	I tended to over-react to situations				

7 (a)	I experienced trembling (e.g. in the hands)				
8 (s)	I felt that I was using a lot of nervous energy				
9 (a)	I was worried about situations in which I might panic and make a fool of myself				
10 (d)	I felt that I had nothing to look forward to				
11 (s)	I found myself getting agitated				
12 (s)	I found it difficult to relax				
13 (d)	I felt down-hearted and blue				
14 (s)	I was intolerant of anything that kept me from getting on with what I was doing				
15 (a)	I felt I was close to panic				
16 (d)	I was unable to become enthusiastic about anything				
17 (d)	I felt I wasn't worth much as a person				
18 (s)	I felt that I was rather touchy				
19 (a)	I was aware of the action of my heart in the absence of physical exertion (e.g. sense of heart rate increase, heart missing a beat)				
20 (a)	I felt scared without any good reason				
21 (d)	I felt that life was meaningless				

c) 10-item Warr-Cook-Wall (WCW) job satisfaction questionnaire with seven-point Likert scales

Please read each statement and choose one of the options There are no right or wrong answers. Do not spend too much time on any statement.

No	Items	extremely dissatisfied	very dissatisfi ed	moderately dissatisfied	not sure	moderately satisfied	very satisfied	extre mely satisfi ed
1	Freedom to choose your own method of working							
2	Amount of variety in your work							
3	Physical working conditions							
4	Opportunitie s to use your abilities							
5	Your colleagues and fellow workers							

6	Recognition you get for good work							
7	Your hours of work							
8	Your remuneratio n							
9	Amount of responsibility you are given							
10	Taking everything into consideratio n, how do you feel about your work?							

Annex 4: Support Letter from Nepal Dental Association

Regd.no.69/047/048  नेपाल डेन्टल एसोसिएसन Nepal Dental Association Sunrise Homes, Flat no.47, ward no. 9, Balkumari, Lalitpur Ph.no.015186690, Email:nepaldentalassociation1990@gmail.com, Website: www.nda.org.np fdi Federation of Dental International APF Asia Pacific Dental Federation Estd. 1990	President Prof.Dr.Pranay Ratna Shakya 9841277764 drpranaysakya@gmail.com Vice President Dr.Roshan Kr. Chaudhary 9841861617 samroshanchaudhary23@gmail.com General Secretary Dr.Bishow Prakash Thakur 9851183390 dr.bsothakur@gmail.com Treasurer Dr. Bidhan Shrestha 9842172056 bidhanbpihs@gmail.com Joint Secretary Dr. Hari Prasad Oli 9851070150 olihari06@gmail.com Member Dr.Deepak Kumar Sharma 9841652043 drdeepak.sharmathakur@gmail.com Dr.Niraj Dhyako 9855018500 niraaz98@gmail.com Dr.Biplob Adhikari 9803003075 adhikari.biplob111@gmail.com Dr. Prerisha Rajbhandary 9849533848 prerisha.r@gmail.com	Falgun 13, 2080 To, Nepal Health Research Council Ramshah Path, Kathmandu, Nepal P.O.Box 7626 Call : 977-1-4254220 Email : nhrc@nhrc.gov.np Subject: Support for Dr. Seeba Shukla's research Dear Sir/Madam, I am writing on behalf of Nepal Dental Association to acknowledge a request for support from Dr. Seeba Shukla for her research project, "<u>Mental Health, Job Satisfaction, and Associated Factors among Nepalese Dentists.</u>" Dr. Shukla has been an active member of our association and we understand the importance of her research work. I confirm that we will gladly assist Dr. Shukla in her research by supporting her with a list of potential participants for her research. Please feel free to reach out with your specific needs, and we will do our best to support Dr. Shukla in achieving her research objectives. We are committed to fostering collaborative relationship and are here to help make her project a success.  Dr. Bishow Prakash Thakur General Secretary
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