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ISSN 297-10777, DOI Prefix: <https://doi.org/10.58196/jhsw.v5i3.15.5.2023>

Double Blinded Peer Reviewed Multi Disciplinary Journal : <https://jhsw.com/>

Publishing Process.

Received on: March 15, 2023.

Finalized to publish after being peer reviewed on April 30

Published on : July 1, 2023

OPEN ACCESS: 4.0

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Abstract

Background: Dental anxiety is an unpleasant poorly defined or not immediately present dental stimulus accompanied by a strong feeling that something harmful usually within a dental context is about to happen. Dental anxiety can result in withdrawal from the regular dental visit, and hesitation in utilizing and seeking dental care and services. All this impact the oral health and hygiene of an individual contributing to oral health-related quality of life.

Methods: This cross-sectional study enrolled 568 college students from five different colleges in Birtamode municipality, Jhapa. Similarly, Purposive sampling was used for the selection of college; a proportionate method was used for the selection of a number of students from each college, and simple random sampling was used for the selection of several respondents from each college.

Results: Among 568 respondents, the prevalence of high dental anxiety was 8.1%. Out of the total respondents, 53% (95% C.I, 0.291-0.985) of males were more dental-anxious than that females and were statistically significant (p-value 0.042). The respondents of the age group 22-25 are 1.99 times (95% C.I, 0.844-4.739) more likely to have high dental anxiety as compared to the age group of 22-25 but were not statistically significant (p-value 0.109). The respondents who have visited the dentist once in six months have 77% lower dental anxiety (95% C.I, 0.022-2.400) also, those who visited the dentist once in a year have 64% lower dental anxiety (95% C.I, 0.080-1.672) and those who visited the dentist rarely have 44% lower dental anxiety (95% C.I, 0.158-1.992) as compared to those who visited the dentist once in a three month. All of these have no association with dental anxiety .



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Conclusion: This research reveals the profound influence of anxiety on students' dental experiences. To address this issue, effective strategies like patient education, relaxation techniques, and sedation options should be implemented for improved oral health outcomes and patient satisfaction. More research is needed to explore additional interventions and assess their long-term effectiveness.

Keywords: Associated factors; Dental anxiety; Prevalence; Risk factors

Introduction

Dental anxiety is a state where one feels uncomfortable generally due to fear of danger from within or by one's surroundings and environment leading to hindrance in the dental treatment (Dikshit P, 2013). Dental anxiety is an unpleasant poorly defined or not immediately present dental stimulus accompanied by a strong feeling that something harmful usually within a dental context is about to happen. The feeling can be psychologically aversive and is usually unknown to an individual. The difference between dental anxiety from dental fear is that it can be understood as a normal phenomenon or reaction to any known hazard which may cause harm in the dental context (Minja IK, 2015). Dental anxiety can affect one's decision in utilizing dental services which ultimately increases the burden of oral health problems worldwide in the near future. Various researchers have mentioned that dental anxiety can result in withdrawal from the regular dental visit and hesitation in utilizing and seeking dental care and services. All this impact the oral health and hygiene of an individual contributing to oral health-related quality of life (OHRQoL) (Kumar S, 2009). Though dental anxiety possesses various harmful effects on individuals and society dental clinicians are also widely affected by it. The required treatment for patient oral health management might not be useful if the patient has dental anxiety. Corah's DAS and the modified dental anxiety scale are widely and commonly used tools for identifying dental anxiety. MDAS is a tool with high reliability and validity consisting of scores from 4 to 20 where scores of more than 15 are taken as anxiety-phobic levels (Dikshit P, 2013). Various factors such as age, gender, Socio-cultural factors economic status, history of toothache presence of dental caries, etc. affect the level of dental anxiety. Identifying the prevalence of dental anxiety can Support various dental clinics and organizations to enhance better patient service and well-being assessing dental anxiety can also help communities to identify effective and appropriate interventions to address the dental anxiety problem (Grisolia, 2020)



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Methodology

In this cross-sectional study, the researchers enrolled 568 college students from five different colleges in Birtamode municipality, Jhapa. The study specifically focused on bachelor students from these colleges' management and humanities faculties. The objective of the study was to examine the relationship between various independent variables and dental anxiety, which served as the dependent variable. The independent variables considered in the study included gender, age, family income, past dental experience, dental visit frequency, source of dental knowledge, religion, marital status, size of family, ethnicity, dental knowledge, and dental hygiene. These variables were hypothesized to have an impact on dental anxiety. To collect the necessary data, the researchers utilized Corah's modified dental anxiety scale, which is a validated tool for assessing dental anxiety. In addition, a semi-structured self-administered questionnaire was used to gather information on the independent variables.

The collected data underwent a process of compilation, editing, and checking, which involved both manual and computerized methods to ensure consistency. The data were entered into EpiData software for further analysis. Various steps such as data coding, re-coding, rechecking, and editing were performed promptly to address any errors or inconsistencies in the data. The researchers used the Statistical Package for the Social Sciences (SPSS) software for data analysis. Descriptive statistics were calculated to summarize the data, and chi-square tests and bivariate analysis were conducted to identify associations between variables. The significance level was set at a p-value of 0.05, indicating that associations with p-values less than or equal to 0.05 were considered statistically significant, while p-values greater than 0.05 indicated no significant association between the variables.



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Findings

Socio-demographic characteristics of the respondent

The current study shows the descriptive analysis of the respondent's socio-demographic characteristics. Table 1 shows the information socio-demographic characteristics of the respondent.

Most of the respondents were between the age group 18-21 years i.e. 91.2% (n=518) whereas the mean age and standard deviation (SD) of the respondent are 19.70 and 1.751 respectively. More than half of the respondents were female i.e. 67.8% (n=385) as compared to males i.e. 32.2% (n=183). The maximum numbers of respondents were Hindu i.e. 80.6% (n=458) whereas Muslims were only 0.9% (n=5). More than half of the respondents were unmarried i.e. 97.2% (n=552) and others were married i.e. 2.8% (n=16). The maximum numbers of respondents were Brahmin/Chhetri i.e. 52.6% (299) whereas others (Kirat) were only 2.3% (n=13). More than half of the respondents were from the nuclear family i.e. 85.2% (n=484) whereas the others were from the joint family i.e. 14.8% (n=84). Most of the respondents were from family sizes less than 10 i.e. 98.4% (n=559) as compared to a family size more than 10 i.e. 1.6% (n=9). The income-related information of the respondent. More than half of the respondents i.e. 68.5% (n=389) were from a family with a monthly income \geq 15000 and 31.5% (n=179) were from a family with a monthly income <15000. (Table 1)

Table 1: Socio-demographic characteristics of the respondent

Characteristics	Frequency (n=568)	Percent (%)
Age group (years)		
18-21 years	518	91.2
22-25 years	50	8.8
Mean	19.70	
SD \pm	1.751	
Gender		
Male	183	32.2
Female	385	67.8



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Table 1: Socio-demographic characteristics of the respondent (continue)

Characteristics	Frequency (n=568)	Percent (%)
Religion		
Hindu	458	80.6
Buddhist	50	8.8
Christian	12	2.1
Muslim	5	.9
Others	43	7.6
Marital status		
Unmarried	552	97.2
Married	16	2.8
Types of family		
Nuclear	484	85.2
Joint	84	14.8
Ethnicity		
Dalit	29	5.1
Janjaati	227	40.0
Brahmin/Chhetri	299	52.6
Others	13	2.3
Family Size		
Less than 10	559	98.4
More than 10	9	1.6

Information on dental hygiene of respondent-

Table 2: Information on dental hygiene of respondent

Characteristics	Frequency (n=568)	Percentage
Times of tooth brushing in a day		
One time	295	51.9
Two or more two times	273	48.1
The material used for tooth brushing		
Toothpaste	567	99.8



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Table 2: Information on dental hygiene of respondent

Characteristics	Frequency (n=568)	Percent (%)
The kind of toothpaste used		
Toothpaste containing fluoride	182	32.0
Toothpaste does not contain fluoride	16	2.8
Don't know	370	65.1
Skip tooth brushing before six months		
Yes	223	39.3
No	345	60.7

Table 2 shows the information on the dental hygiene of respondents. Out of the total respondents, more than half of the respondents i.e. 51.9% (n=295) were those who brushed their teeth one time a day as compared to those who brushed their teeth two times a day i.e., 48.1% (n=273). The respondents who used toothpaste without fluoride were only 2.8% (n=16) as compared to those who used toothpaste with fluoride i.e. 32% (n=182). Most respondents 65.1% (n=370) do not know what kind of toothpaste they used. More than half of respondents i.e. 60.7% (n=345) were those who didn't skip teeth brushing before six months as compared to those who skipped brushing before six months i.e. 39.3% (n=223).

Information on a dental visit

Table 3: Information on a dental visit

Characteristics	Frequency	Percent (%)
Ever visited dentist (n=568)		
Yes	196	34.50
No	372	65.49
Own reason for dental visit (n=196)		
Yes	176	89.79
No	20	10.2



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The respondents who used toothpaste without fluoride were only 2.8% (n=16) as compared to those who used toothpaste with fluoride i.e.32% (n=182). Most respondents 65.1% (n=370) do not know what kind of toothpaste they used.

More than half of respondents i.e. 60.7% (n=345) were those who didn't skip teeth brushing before six months as compared to those who skipped brushing before six months i.e. 39.3% (n=223).



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Information on the source of dental knowledge

Table 6 shows the source of dental knowledge of respondents. Around one-fourth of respondents i.e. 27.6% (n=157) received dental knowledge from social media and the least were 2.1% (n=12) who received dental knowledge from other sources such as dentists, television, etc.

Table 6: Information on the source of dental knowledge

Characteristics (n=568)	Frequency	Percent
Friends/family	144	25.4
Social media	157	27.6
Newspaper/pamphlets	14	2.5
Others	12	2.1
Both 1 and 2	134	23.6
1, 2 and 3	107	18.8

Dental anxiety among respondents

Table 7 shows the dental anxiety of respondents. Among 568 respondents, the prevalence of high dental anxiety was 8.1% (n=46), and the remaining 91.9% (n=522) of respondents were not dentally anxious.

Table 7: Dental anxiety among respondents

Characteristics (n=568)	Frequency	Percent (%)
Dental Anxiety		
Low dentally anxious	522	91.9
Highly dentally anxious	46	8.1

Relation of a socio-demographic factor to dental anxiety

Table 8 shows the association between the socio-demographic factors of the respondent with dental anxiety. Out of the total respondents, 53% (95% C.I, 0.291-0.985) of males were more dentally anxious than that females and were statistically significant (p-value 0.042).

The respondents of the age group 22-25 are 1.99 times (95% C.I, 0.844-4.739) more likely to have high dental anxiety as compared to the age group of 22-25 but were not statistically significant (p-value 0.109).



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Table 4: Characteristics on a dental visit

Characteristic	Frequency (n=568)	Percent (%)
Reason for dental visit (n=196)		
Pain/swelling of gums	38	19.38
Dental checkup/follow-up	60	30.61
Tooth extraction	67	34.18
Others	31	15.81
Frequency of dental visits (n=568)		
once in 3month	21	3.7
once in 6 month	27	4.8
once a year	87	15.3
Rarely	433	76.2

Table 4 shows the information on the dental visit of respondents. More than half of respondents i.e. 65.7% (n=373) were those who have not visited a dentist ever as compared to those who have visited a dentist i.e., 34.3% (n=195). The most of respondents i.e. 89.79% (n=176) visited the dentist for their reason as compared to those who do not visit for their reason i.e., 10.2% (n=20). Nearly one-third respondents visited the dentist for tooth extraction i.e. 34.18% (n=67) whereas the least visited a dentist for other reasons such as dental caries i.e. 15.81% (n=31). More than half of respondents visited the dentist rarely i.e. 76.2% (n=433) and the least were those who visited the dentist once in three months i.e., 3.7% (n=21).

Information on the experience of the dental visit

Table 5 shows the information on the experience of the dental visit respondents. Most respondents i.e. 48.46% (n=95) experienced well in their dental visits whereas 46.42% (n=91) of visited respondents had a bad experience on a dental visit. The least was 5.1% (n=10) who experienced other feelings such as medium i.e., neither good nor bad.

Table 5: Information on the experience of a dental visit

Characteristics	Frequency	Percent (%)
Experience in dental treatment (n=196)		
Painful	91	46.42
Good	95	48.46
Others	10	5.1



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The married respondents were 1.69 times (95% C.I, 0.363-7.491) more dentally anxious than the unmarried but were not statistically significant (p-value 0.513). The respondents with a family income family ≥ 15000 were 1.985 times (95% C.I, 0.937-4.208) more likely to have high dental anxiety than the family with income <15000 and were not statistically significant (p-value 0.069).

Table 8: Relation of a socio-demographic factor to dental anxiety

Characteristics	Low dentally anxious	Highly dentally anxious	p-value	Odds ratio(95% C.I)
Gender				
Male	162 (88.5%)	21 (11.5%)	0.042	0.536 (0.291-0.985)
Female	360 (93.5%)	25 (6.5%)		
Age group				
18-21	479 (92.5%)	39 (7.5%)	0.109	1.999 (0.844-4.739)
22-25	43 (86%)	7(14%)		
Marital status				
Unmarried	508 (92%)	44 (8%)	0.513	1.649 (0.363-7.491)
Married	14 (87.5%)	2 (12.5%)		
Monthly income of the family				
<15000	170 (95%)	9 (5%)	0.069	1.985 (0.937-4.208)
≥ 15000	352 (90.5%)	37 (9.5%)		

Relation of oral hygiene behavior related factor with dental anxiety

Table 9 shows the association between oral hygiene behavior-related factors of the respondent with dental anxiety. Out of the total respondents, those who brushed their teeth two or more two times a day have 26% lower dental anxiety (95% C.I, 0.403-1.369) than those who brushed their teeth one time a day and were not statistically significant (p-value 0.339).

The respondents who used toothpaste with fluoride had 28% lower dental anxiety (95% C.I, 0.363-1.431), and those who used toothpaste without fluoride had 32% lower dental anxiety (95% C.I, 0.087-5.318) as compared to those who do not know what kind of toothpaste they used.



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Both respondents who used toothpaste containing fluoride and toothpaste without fluoride have no association with dental anxiety (p-value 0.350, 0.714 respectively).

The respondents who skipped teeth brushing before six months have 28% higher dental anxiety (95% C.I, 0.450-1.521) as compared to those who do and have no significant association with dental anxiety (p-value 0.541). The respondents who have not visited a dentist ever were 1.088 times (95% C.I, 0.572-2.068) more likely to have dental anxiety as compared to those who do and have no significant association with dental anxiety (p-value 0.797). The respondents who do not visit the dentist for their reason were 2.412 times (95% C.I, 0.619-9.398) more likely to have dental anxiety as compared to those who visit for their reason and have no significant association with dental anxiety (p-value 0.192). The respondents who have visited the dentist for dental checkups/follow-up have 89% lower dental anxiety (95% C.I, 0.013-0.998) also, those who visited the dentist for tooth extraction have 47% lower dental anxiety (95% C.I, 0.144-1.972) and those who visited the dentist for the reason such as dental caries have 3% lower dental anxiety (95% C.I, 0.239-4.004) as compared to those who visited the dentist due to pain/swelling of gums. The respondents who have visited the dentist for dental checkups/follow-ups have a significant association with dental anxiety (p-value 0.050) whereas the other two have no association with dental anxiety (p-value 0.345, 0.975 respectively).

The respondents who experienced good dental visits had 14% lower dental anxiety (95% C.I, 0.066-5.616) and those who have a bad experience on a dental visit had 40% lower dental anxiety (95% C.I, 0.097-7.749) as compared to those who experience other feelings such as medium. Both respondents who have experienced good dental visits and those who have a bad experience on dental visits had no association with dental anxiety (p-value 0.899, 0.660 respectively). The respondents who have visited the dentist once in six months have 77% lower dental anxiety (95% C.I, 0.022-2.400) also, those who visited the dentist once in a year have 64% lower dental anxiety (95% C.I, 0.080-1.672) and those who visited the dentist rarely have 44% lower dental anxiety (95% C.I, 0.158-1.992) as compared to those who visited the dentist once in a three month. All of these have no association with dental anxiety (p-value 0.220, 0.195, 0.371 respectively). The respondents who had dental knowledge from friends/families are 1.228 times more likely to have dental anxiety (95% C.I, 0.490-3.077) also, those who had dental knowledge from the other source such as dentists, television, etc. are 2.475 times more likely to have dental anxiety (95% C.I, 0.461-13.286) and those who had dental knowledge from friends/families and social



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ISSN 297-10777, DOI Prefix: <https://doi.org/10.58196/jhsw.v5i3.15.5.2023>

Double Blinded Peer Reviewed Multi Disciplinary Journal : <https://jhsw.com/>

Publishing Process.

Received on: March 15, 2023.

Finalized to publish after being peer reviewed on April 30

Published on : July 1, 2023

OPEN ACCESS: 4.0

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media are 1.107 times more likely to have dental anxiety (95% C.I, 0.429-2.857) as compared to those who had dental knowledge from friends/families, social media and newspaper/pamphlets. All of these have no association with dental anxiety (p-value 0.661, 0.291, 0.834 respectively).

Table 9: Relation of oral hygiene behavior related factor with dental anxiety

Characteristics	Low dentally anxious	High dentally anxious	p-value	Odds ratio (95% C.I)
Times of tooth brushing in a day				
One time	268 (90.8%)	27 (9.2%)	0.339	0.742(0.403-1.369)
Two or more two times	254 (93%)	19 (7%)		
The kind of toothpaste used				
Toothpaste containing fluoride	182 (93.4%)	32.0 (6.6%)	0.350	0.721 (0.363-1.431)
Toothpaste not containing fluoride	16 (93.8%)	2.8 (6.3%)	0.714	0.681 (0.087-5.318)
Don't know	370 (91.1%)	65.1 (8.9%)	—	1.000
Skip tooth brushing before six months				
Yes	203 (91%)	20 (9%)	0.541	0.827 (0.450-1.521)
No	319 (92.5%)	26 (7.5%)		
Ever visited dentist				
Yes	180 (92.3%)	15 (7.7%)	0.797	1.088 (0.572-2.068)
No	342 (91.7%)	31 (8.3%)		
Own reason for a dental visit				
Yes	164 (93.2%)	12 (6.8%)	0.192	2.412 (0.619-9.398)
No	17 (85%)	3 (15%)		
Reason for a dental visit				
Pain/swelling of gums	33 (86.8%)	5 (13.2%)	—	1
Dental checkup/follow-up	59 (98.3%)	1 (1.7%)	0.050	0.112 (0.013-0.998)
Tooth extraction	62 (92.5%)	5 (7.5%)	0.345	0.532 (0.144-1.972)
Others	27 (87.1%)	4 (12.9%)	0.975	0.978 (0.239-4.004)
Experience of the dental visit				
Painful	83 (91.2%)	8 (8.8%)	0.899	0.867 (0.097-7.749)
Good	89 (93.7%)	6 (6.3%)	0.660	0.607 (0.066-5.616)
Others	9 (90%)	1 (10%)	—	1
Frequency of dental visit				
Once in 3month	18 (85.7%)	3 (14.3%)	—	1
Once in 6 months	26 (96.3%)	1 (3.7%)	0.220	0.231 (0.022-2.400)
Once a year	82 (94.3%)	5 (5.7%)	0.195	0.366 (0.080-1.672)
Rarely	396 (91.5%)	37 (8.5%)	0.371	0.561 (0.158-1.992)
Source of dental knowledge				
Friends/family	131 (91%)	13 (9%)	0.661	1.228 (0.490-3.077)
Social media	146 (93%)	11 (7%)	0.885	0.932 (0.362- 2.401)
Newspaper/pamphlets	13 (92.9%)	1(7.1%)	0.964	0.952 (0.110-8.236)
Others	10 (83.3%)	2 (16.7%)	0.291	2.475 (0.461-13.286)
Both 1 and 2	123 (91.8%)	11 (8.2%)	0.834	1.107 (0.429-2.857)
1, 2 and 3	99 (92.5%)	8 (7.5%)		1.000



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OPEN ACCESS: 4.0

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Table 9: Relation of oral hygiene behavior related factor with dental anxiety (Continue)

Characteristics	Low dental-ly anxious	High dentally anxious	p-value	Odds ratio (95% C.I)
Frequency of dental visit				
Once in 3month	18 (85.7%)	3 (14.3%)	—	1
Once in 6 months	26 (96.3%)	1 (3.7%)	0.220	0.231 (0.022-2.400)
Once a year	82 (94.3%)	5 (5.7%)	0.195	0.366 (0.080-1.672)
Rarely	396 (91.5%)	37 (8.5%)	0.371	0.561 (0.158-1.992)
Source of dental knowledge				
Friends/family	131 (91%)	13 (9%)	0.661	1.228 (0.490-3.077)
Social media	146 (93%)	11 (7%)	0.885	0.932 (0.362-2.401)
Newspaper/pamphlets	13 (92.9%)	1(7.1%)	0.964	0.952 (0.110-8.236)
Others	10 (83.3%)	2 (16.7%)	0.291	2.475 (0.461-13.286)
Both 1 and 2	123 (91.8%)	11 (8.2%)	0.834	1.107 (0.429-2.857)
1, 2 and 3	99 (92.5%)	8 (7.5%)		1.000

Discussions

In the current study among a total of 568 respondents, the mean age and standard deviation of the respondent were 19.70 and 1.751 respectively. Most of the respondents were female (67.8%). The maximum numbers of respondents were Hindu (80.6%). Regarding marital status, (97.2%) were unmarried. The prevalence of high dental anxiety among the students was 8.1%. The prevalence of dental anxiety among college students is low. A study conducted in India showed similar findings (Appukuttan D. P., 2013). However, the study conducted in Nigeria, and among university students in the U.K. have a slightly more dental anxiety prevalence of 10.7-12.2% (Koleoso, 2014; Humphries, 2011). This finding is similar to the findings of this study. These differences may be due to variations in preferred cut-off scores, and characteristics of the study population. The study concluded that the anxiety level was found to be low in 26.7% of males and 35.6% of females. Here, 2.9% of males and females showed severe levels whereas 8.9% of females and 0.9% of males showed high anxiety levels (Dikshit P, 2013). Contrary to these, the findings of this study revealed that 11.5% of males and 6.5% of females were highly dentally anxious.



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OPEN ACCESS: 4.0

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The dental anxiety prevalence varied with the different groups among adult age groups. In a study conducted among adults in Nigeria, the dental anxiety prevalence rate was found to be 10.7%. A study among primary school teachers found that high dental anxiety among them was 1.2% (Minja IK, 2015). The two different age group of this study also showed that high anxiety level was between the age group 22-25 i.e., 14% as compared to the age group of 18-21 i.e., 7.5%. A study showed that the number of people who had painful dental experiences was 71%, 23% of people were afraid and dental experience became a type of embarrassment for 9% of people. The association between these experiences and dental anxiety was strongly related (Locker, 1996). Likewise, the study concluded that bad experience in past dental visit leads to dental anxiety (Appukuttan D. S., 2015; Malvania, 2011; Arigbede, 2011). The findings of this study agreed with their findings i.e., those respondents who experienced good dental visits had 14% lower dental anxiety (95% C.I, 0.066-5.616) and those who have a bad experience on the dental visit were 40% lower dental anxiety (95% C.I, 0.097-7.749) as compared to those experience other feelings such as medium. Both respondents who have experienced good dental visits and those who have a bad experience on dental visits had no association with dental anxiety (p-value 0.899, 0.660 respectively).

In this study, the respondents who have visited a dentist once in six months have 77% lower dental anxiety (95% C.I, 0.022-2.400) also, those who visited a dentist once in a year have 64% lower dental anxiety (95% C.I, 0.080-1.672) and those who visited dentist rarely have 44% lower dental anxiety (95% C.I, 0.158-1.992) as compared to those who visited the dentist once in a three month. All of these have no association with dental anxiety (p-value 0.220, 0.195, 0.371 respectively). These findings were like the findings of (Malvania, 2011).

This study found that the respondents who have visited the dentist for dental checkup checkups/follow-up have 89% lower dental anxiety (95% C.I, 0.013-0.998) also, those who visited the dentist for tooth extraction have 47% lower dental anxiety (95% C.I, 0.144-1.972) and those who visited the dentist for the reason such as dental caries have 3% lower dental anxiety (95% C.I, 0.239-4.004) as compared to those who visited the dentist due to pain/swelling of gums. The respondents who have visited a dentist for dental checkup/follow-up have a significant association with dental anxiety (p-value 0.050) whereas the other two have no significant association with dental anxiety (p-value 0.345, 0.975 respectively).



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These findings supported the study which described the reason that patient generally attends the dental clinic when they are in pain (Kikwilu, 2016).

Conclusion

The findings from the dental anxiety research highlight the significant impact of anxiety on students' dental experiences. These implications emphasize the importance of implementing effective strategies for managing dental anxiety, such as patient education, relaxation techniques, and the use of sedation options, to improve oral health outcomes and overall students satisfaction. Further research is warranted to explore additional interventions and evaluate their long-term effectiveness.

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