

Prevalence of Carpal Tunnel Syndrome among Dental Students and Dental Assistants of Dental Colleges in Riyadh, Saudi Arabia- A Cross Sectional Study

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ABSTRACT:

Background: Dentists in their practice are exposed to work-related vibrations on a daily basis. Carpel tunnel syndrome occurs due to overuse of the hand while using vibratory equipment such as sizing, turbines, and handles with slow speeds, gripping and working with tools or other small objects such as endodontic files.

Objectives: The main aim of this cross-sectional study was to measure the prevalence of carpal tunnel syndrome among dental students and dental assistants

Methodology: A questionnaire was utilized in this study to determine the prevalence of CTS. The prevalence was measured using the Symptom Severity Scale. We got 209 responses from dental colleges in Saudi Arabia.

Results: More than 100 participants indicated that they had symptoms of carpal tunnel syndrome. The patient with symptoms generally complained of little hand pain at night. They are often encountered with mild to severe hand pain during the day. It was determined whether the hand numbness was slight, moderate, or severe. The individuals mainly described slight hand numbness.

Conclusion: Carpal tunnel syndrome is a prevalent condition, and dental assistants and students in our investigation were more likely to develop it than the general population. To prevent severity since students are more likely to be affected, it would be advantageous if good ergonomics were used and taught to students at the academic level.

Keywords: Carpal tunnel syndrome, Dental students, Numbness, Pain, Tingling Sensation

INTRODUCTION:

The carpal tunnel is a narrow passageway in the anterior part of the forearm that connects the wrist to the palm. It protects the median nerve and nine flexor tendons that bend the fingers. Approximately 3-6% of the general population have carpal tunnel syndrome (CTS). CTS is more prevalent among people with occupations that involve repetitive and forceful maneuvers', such as dentists. It is important to identify risk factors for these symptoms and to understand the impact they may have on clinical

practice ^[1]. Pressure changes in Guyon's canal and the carpal tunnel before and after endoscopic (11 cases) and open (10) carpal tunnel release found that release of the flexor retinaculum by endoscopic and open techniques measurably decreased pressure in both the carpal tunnel and Guyon's canal ^[2]. Work related musculoskeletal disorders (MSDs) are one of the commonest occupational hazards among health care providers. There is a higher prevalence of MSDs experienced by dental surgeons than physicians and surgeons ^[3].

The symptoms of the syndrome, including numbness, tingling, discomfort, and finally weakness affecting the palmar surface of the thumb, index, and middle finger, are brought on by compression of the median nerve ^[4]. The typical presentations involve numbness, tingling, or burning along the median nerve's distribution. As the severity increases, this often starts at night and continues throughout the day. Dentists are more likely to experience hand and finger discomfort symptoms than the general population since they ostensibly put in more hours at work ^[5]. Forceful hand movements during scaling and extractions, using vibrating ultrasonic equipment, and frequently working with the wrist in flexion or extension are all potential causes of CTS in the dentistry profession. As a result, the practise of dentistry is thought to be an occupational risk factor for this illness ^[6]. Dental workers working in many dental specialties have a significant prevalence of CTS. The repeated nature of the labour, vigorous exertions, mechanical stress, poor posture, and vibration from ultrasonic scalers and Low and high-speed handpieces are ergonomic risk factors for CTS. A number of anthropometric parameters, including age, sex, body mass index, and medical conditions, such as chronic diseases including diabetes, thyroid, rheumatoid arthritis, obesity, and usage of oral contraceptives, are also recommended. The presence of MSD has an impact on working procedures and results in wasted time or ineffective productivity ^[7]. More

clinically experienced dentists had CTS diagnoses. An investigation that revealed dental hygienists who had been in the field for a while had a higher risk of developing CTS lent credence to this. Although CTS can cause significant loss of hand function and total, irreversible damage to the median nerve if neglected ^[8].

CTS is the also the most preventable nerve entrapments in the upper limb. In Saudi Arabia, few studies have investigated CTS in the general population. A total of 95 cases and 190 controls were included. Most of the participants were female (84.2%) and Saudi (93%). Most of cases were above 45 years of age (73.7%), while 84.7% were 45 year – old or younger among the control group. Stratified logistic regression showed that performance of household chores was significantly associated with CTS. While physical exercise associated with decreased odds of CTS ^[9]. Study has shown that 12-week night-time splinting is beneficial not only for patients with mild CTS but also for those with advanced CTS, and those awaiting surgical treatment. Therefore, splinting is recommended for all patients with CTS ^[10].

The purpose of the study was to assess and measure prevalence and Severity of Carpal Tunnel Syndrome (CTS) among dental students and dental assistants in dental colleges of Riyadh-Saudi Arabia.

METHODOLOGY:

This study used a questionnaire to assess the prevalence of CTS. The use of the Symptom Severity Scale assessed the prevalence. The questionnaire also identified the variables such as gender, age and medications.

Study area

The presented study was conducted in Randomly Selected Dental Educational Institutes in Riyadh, Saudi Arabia (Riyadh Elm University, King Saud University, Imam Abdulrahman bin Faisal University, King Faisal University).

Study domain

Dental Students and Dental Assistants diagnosed with CTS. Non-probability Convenient sampling method was employed. Study subject's voluntary participation and confidentiality was ensured.

Study Design

Cross sectional close ended mailed Questionnaire based survey on Dental Students and Dental Assistants diagnosed with CTS, Riyadh, Saudi Arabia. Sample size of 209 was considered for analysis.

Study Period:

After obtaining approval from The Institutional Review Board, Riyadh Elm University during the month of April 2022.

Data collection

The questionnaire for the present study was developed from the previous study and the validity of questionnaire was done by the pilot study.

INCLUSION/EXCLUSION CRITERIA FOR THE STUDY

Inclusion criterion

1. Dental students and dental assistants diagnosed with CTS.
2. University Hospitals in kingdom Saudi Arabia.

Exclusion criterion

1. Dental students and dental assistants having any systemic disease.
2. Students in preclinical years (1st and 2nd Year students).

Data management and Statistical Methods:

Data was entered and analyzed using Statistical Package for Social Sciences (SPSS), IBM SPSS Statistics for Windows, and version 25.0. Armonk. NY; IBM Corp. A descriptive analysis of data was followed by inferential statistics. Chi square and Fisher's exact tests will be used for comparison of categorical data. A p value of ≤ 0.05 at 95% CI was considered as statistically significant.

RESULTS

Table 1 as shown below represents the demographic characteristics of the questionnaire and the responses that we received from the participants enrolled in our investigation.

Table 1. Demographic of respondent (N=209)		
variable	category	n(%)
Q1-Gender participant	A. male B. Female	78 (36.8) 131 (62.7)
Q2-Age of participant ;	A. 20- 24 years B. 25- 30 years C. 31-36 years	89 (42.6) 95 (45.5) 25 (12)
Q3-Marital status ;	A. Married B. single	43 (20.6) 166 (78.9)
Q4-Body mass index group ;	A. normal B. overweight C. obese	159 (75.6) 47 (22.5) 3
Q5-Dominant hand ;	A. Right handed B. left handed	180 (86.1) 29 (13.9)
Q6-Smoking ;	A. Yes B. No	36 (17.2) 173 (82.8)
Q7-Exercise ;	A. Yes B. No	87 (41.1) 122 (58.4)
Q8-Current practice in dental university clinic ;	A. riyadh elm university B. king saud university C. imam abdulrahman bin faisal university D. king faisal university	81 (38.8) 46 (22) 53 (25.4) 29 (13.4)
Q9-Your specialty ;	A. Dental student B. Dental assistant	166 (79.4) 43 (20.6)
Q10-Educational level ;	A. level 5 B. level 6 C. level 7 D. level 8 E. level 9 F. level 10 G. level 11 H. level 12 I. intern	5 11 4 24(11.5) 11 28 (13.4) 12 24 (11.5) 90 (43.1)
Q11-Current practice in dental specialty clinic ;	A. Restoration dentistry B. endodontic dentistry C. paediatric dentistry D. prosthodontics E. orthodontics F. maxillofacial surgery G. General practitioner H. other	17 (8.1) 7 8 1 2 19 (9.1) 134 (64.1)
Q12-Medical disease or condition ;	A. Yes B. No	30 (14.4) 178 (85.6)
Q13-Do you use drug ;	A. Yes B. No	15 (7.2) 194 (92.8)
Q14-Previously diagnosed with carpal tunnel syndrome (CTS) ;	A. Yes B. No	27 (12.9) 182 (87.1)

Q15-Carpal tunnel syndrome (CTS) symptoms ;	A. Yes B. No	116 (55.5) 93 (44)
If your answer to the question 15 is yes, then answer the following questions		
Q16-Hand or wrist pain at night ;	A. mild B. moderate C. severe	97 (64.7) 42 (28) 11 (6.7)
Q17-Hand or wrist pain at daytime ;	A. mild B. moderate C. severe	76 (49.7) 66 (42.5) 11 (7.2)
Q18-Hand numbness ;	A. mild B. moderate C. severe	74 (49) 55 (35.8) 22 (14.6)
Q19-Hand weakness during work ;	A. mild B. moderate C. severe	69 (46.3) 59 (38.9) 21 (14.1)
Q20-Hand tingling ;	A. mild B. moderate C. severe	76 (50.3) 53 (34.4) 22 (14.6)
Q21-Difficulty in grasping and usage of small objects ;	A. mild B. moderate C. severe	80 (54.1) 49 (32.4) 19 (12.8)
Q22-Difficulty in handling of manual instrument ;	A. mild B. moderate C. severe	75 (51) 48 (32) 24 (16.3)
Q23-Difficulty in handling of forceps ;	A. mild B. moderate C. severe	78 (53.8) 36 (24.1) 31 (21.4)

Table 1: Demographic characteristics of the questionnaire and responses received

Figure 1 (a), (b) and (c) represent the number of responses received from the individuals undertaking the different parts of the questionnaire in terms of a bar graph.

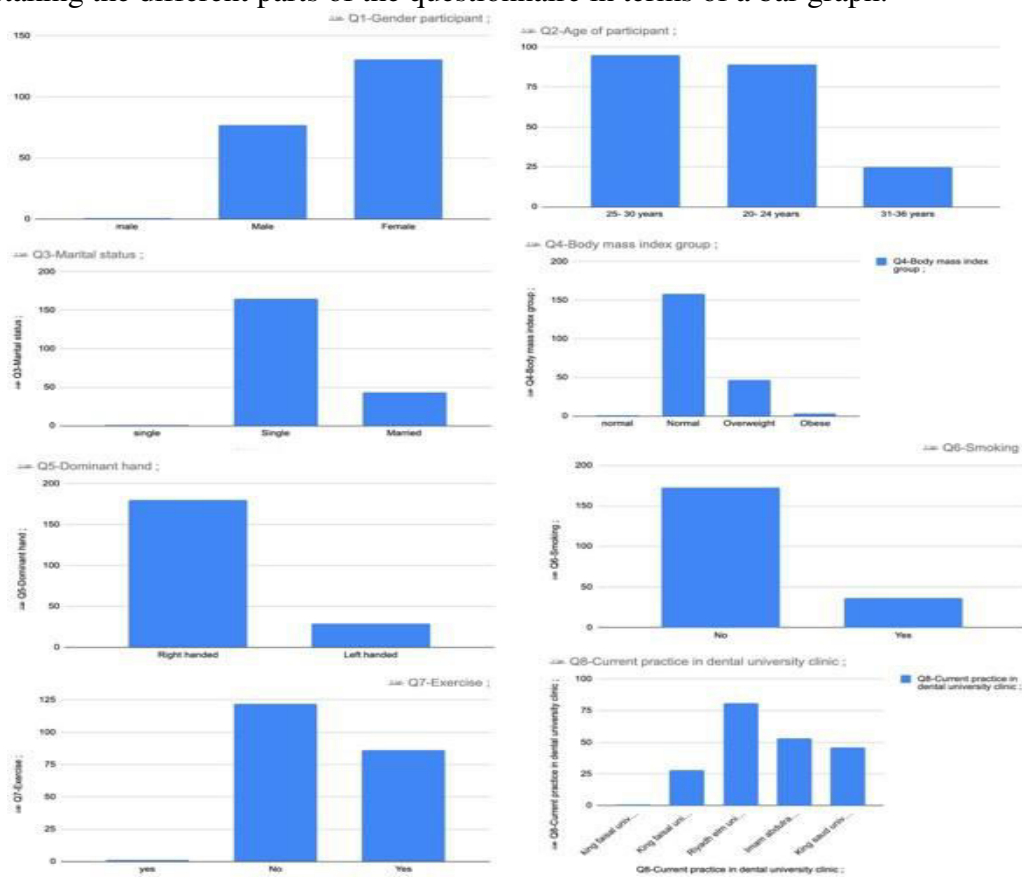


Figure 1 (a): Number of responses received while answering questions 1-8

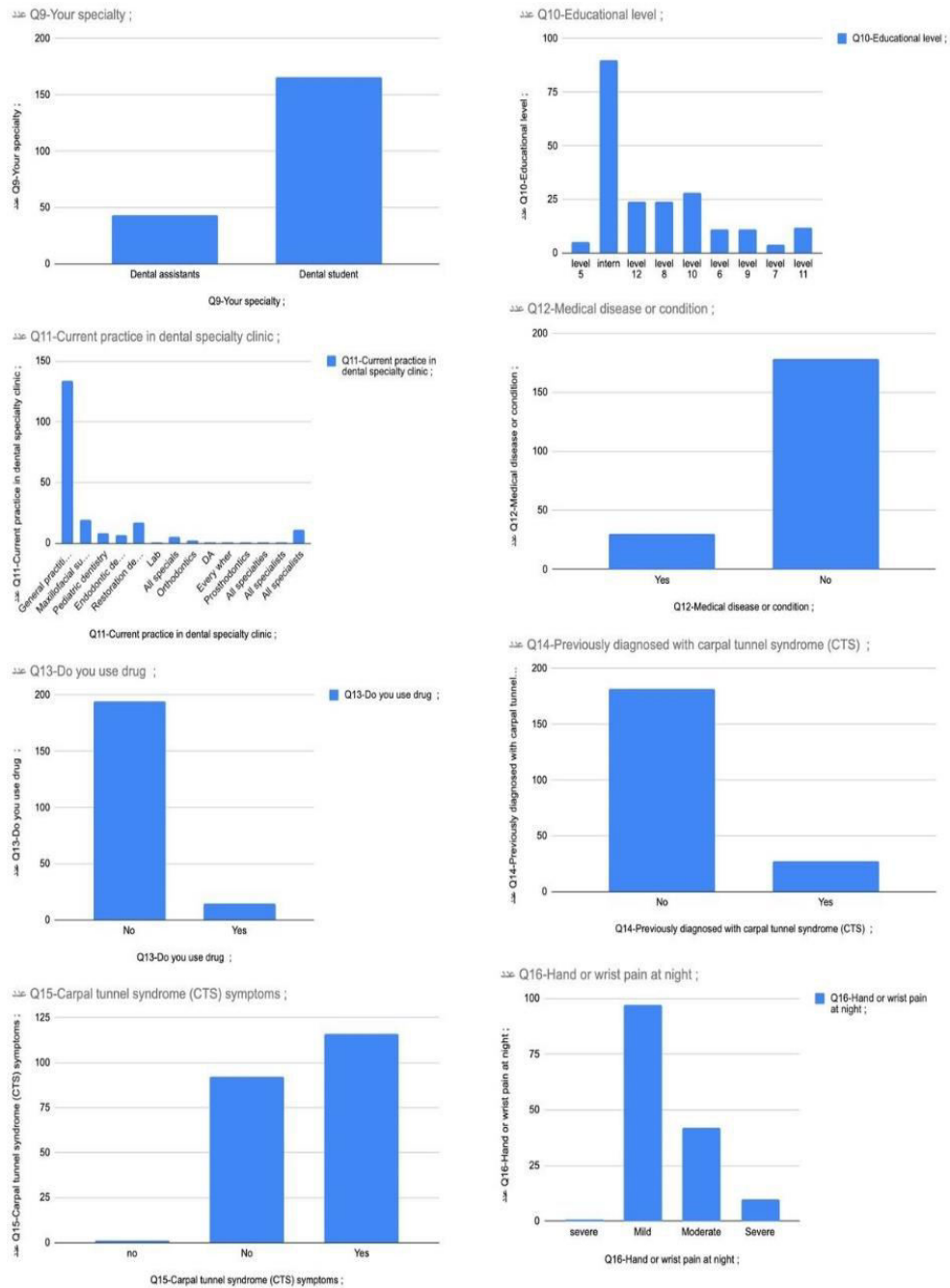


Figure 1 (b): Number of responses received while answering questions 9-16

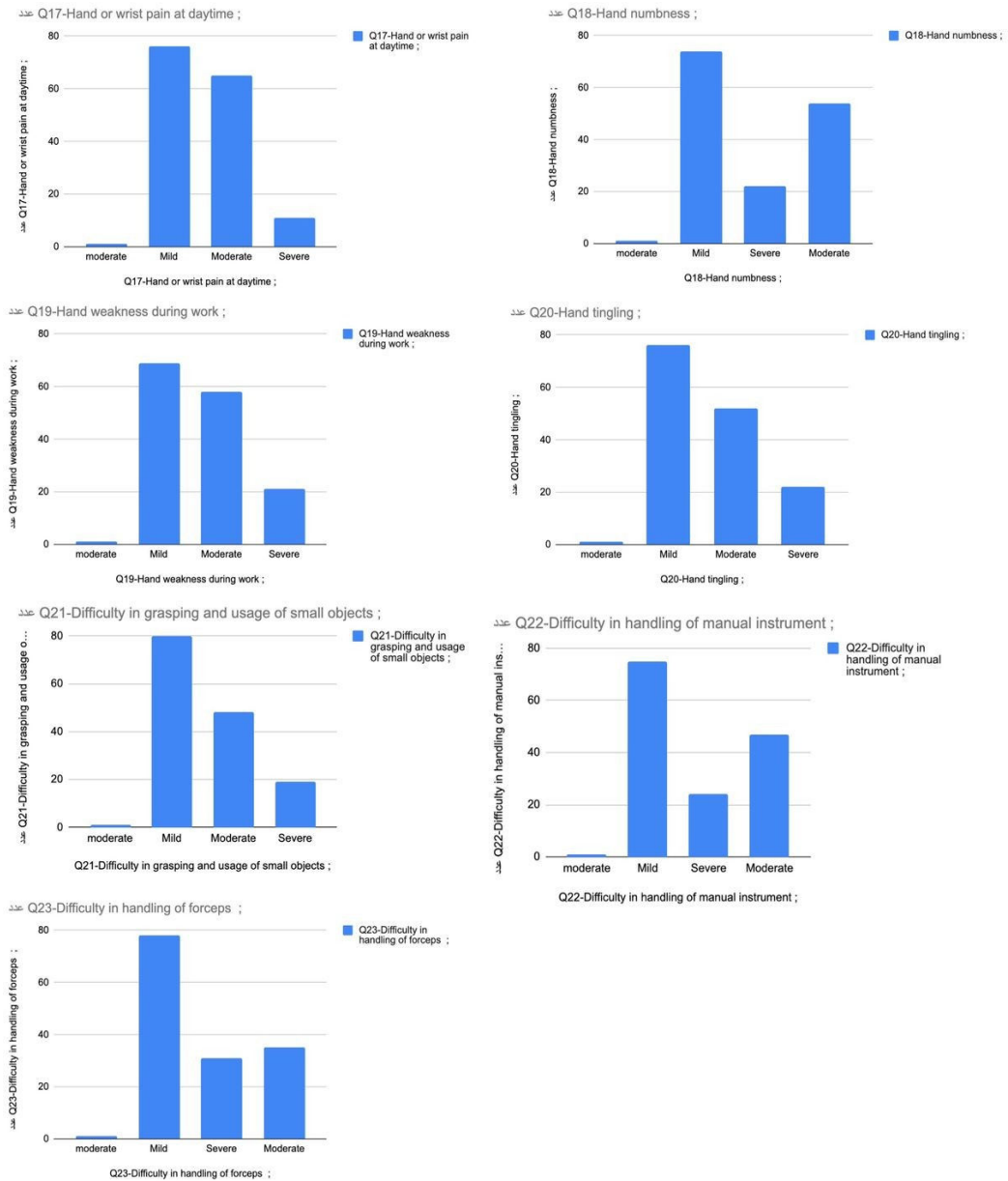


Figure 1 (c): Number of responses received while answering questions 17-23

Figure 2 (a), (b) and (c) are pie chart representations of the percentages of responses that we received through the questionnaire.

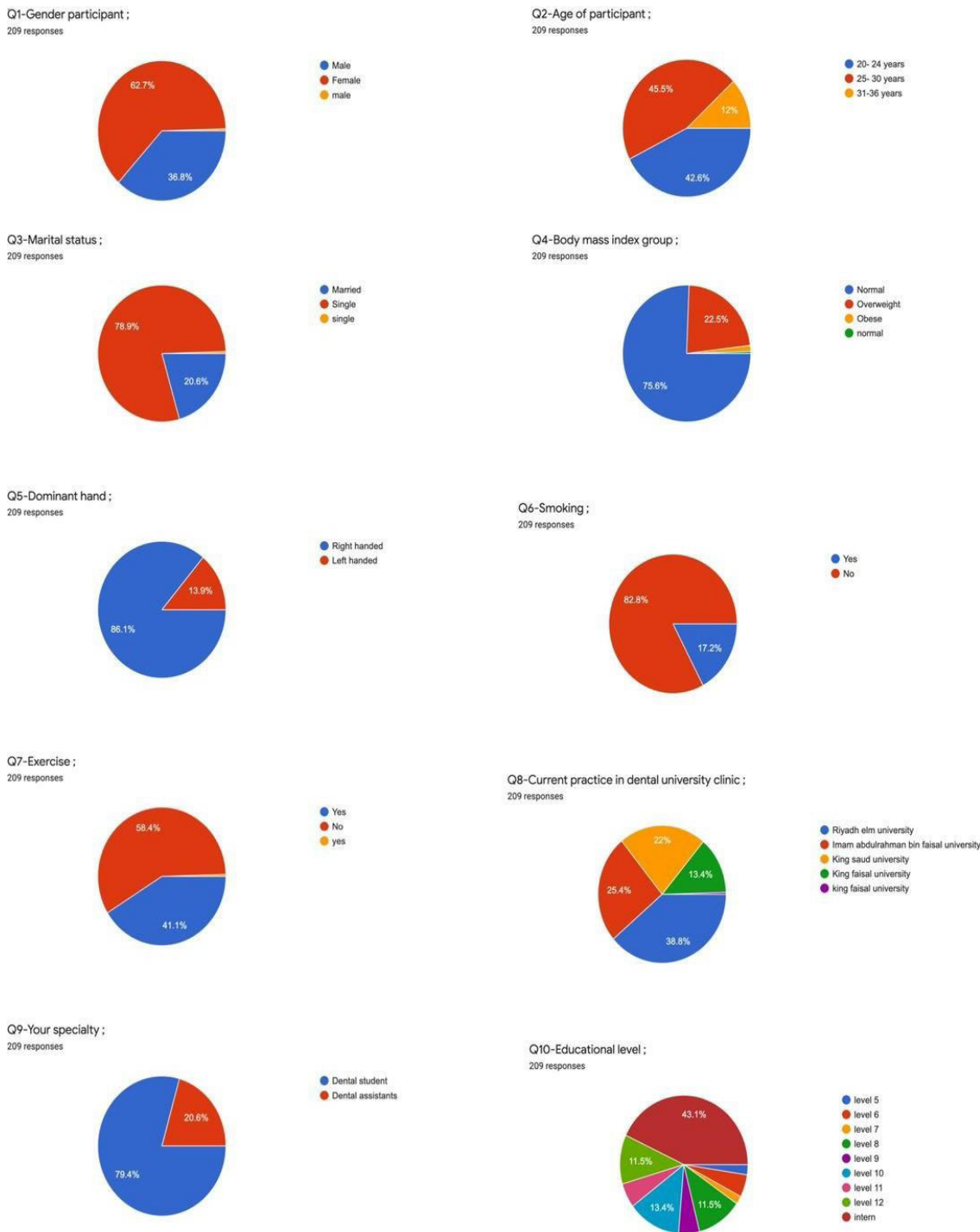


Figure 2 (a): Percentage of responses received while answering questions 1-10 as represented by pie chart

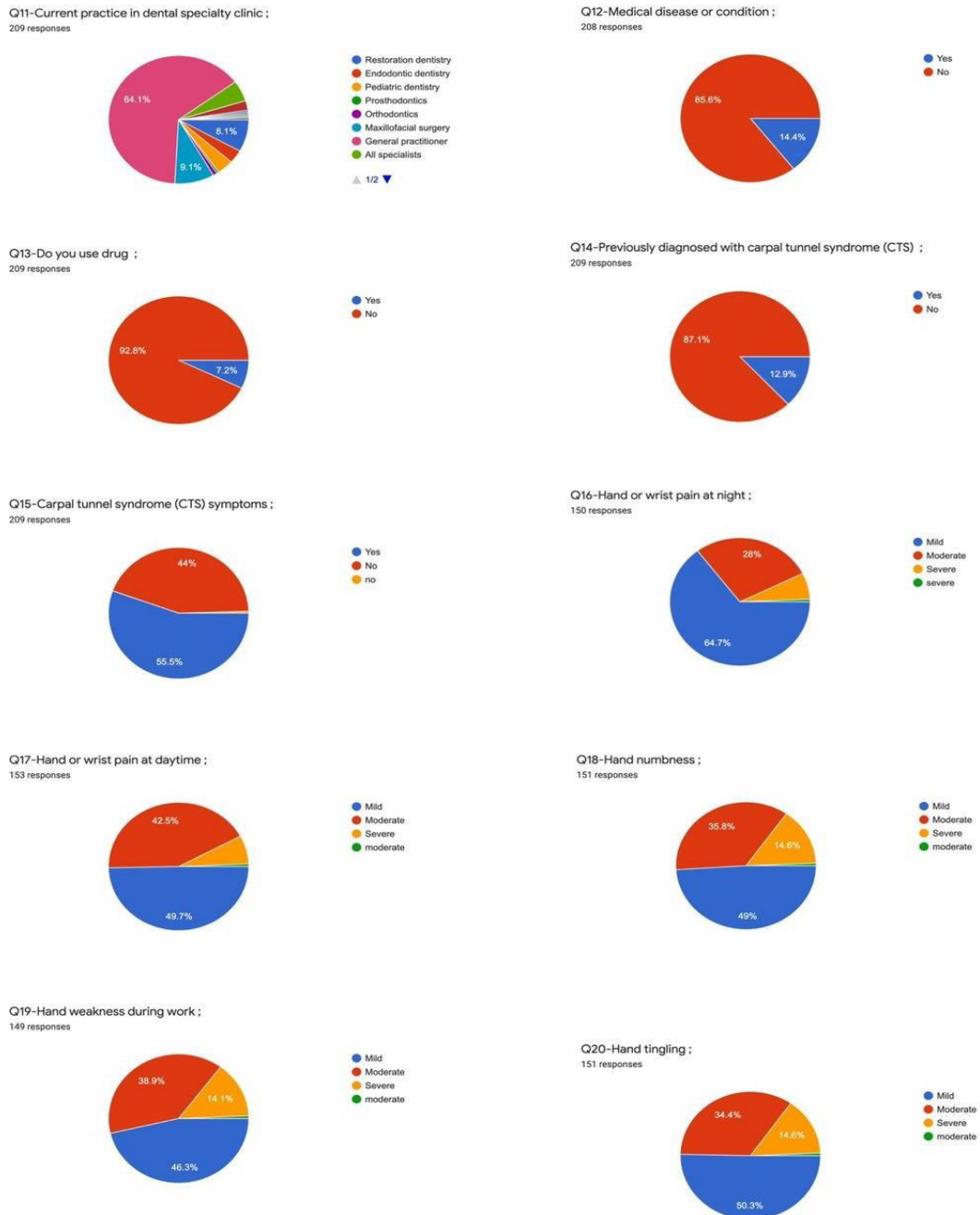


Figure 2 (b): Percentage of responses received while answering questions 11-20 as represented by pie chart

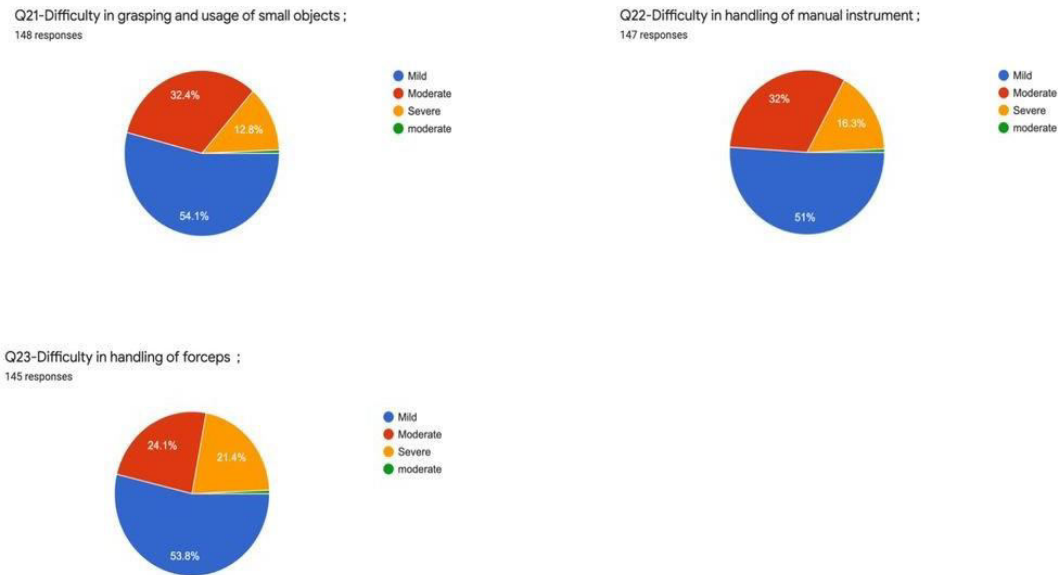


Figure 2 (c): Percentage of responses received while answering questions 20-23 as represented by pie chart

DISCUSSION

The carpal passage is a "way" in the wrist through which nerves pass. At the point when this passage limits, it increments strain on the middle nerve — one of the primary nerves in the hand ^[11]. The outcome is deadness, shivering and torment in your grasp and arm. Carpal passage condition (CTS) influences a huge number of dental workers every year ^[12].

The condition can be much more decimating for those whose professions require fragile, dreary errands, for example, mechanical production system work, assembling and PC work ^[13]. Dental hygienists are at an especially high gamble of creating CTS. The study was done among 209 sample. Both the dental students and assistants were included in the study. The need for the study is very much important to identify the carpal tunnel syndrome prevalence among the workers. The evaluation of study was done with questioner. In this study mostly the female participants were present. The people with normal body mass was found to be more among the participants group. The participant was found mostly with right hand practice. The participants were mostly the general practitioners followed by maxilla facial surgeon. The participants with systemic diseases are excluded from the study. More than 100 participants reported yes to presence of carpal tunnel syndrome symptoms. But only few people were diagnosed with the carpal tunnel syndrome before the study. The patient with symptoms reported mostly mild pain in hands during night time. During day time they are found with mild to moderate

intensity of pain in hands. The hand numbness was evaluated as mild, moderate and severe. The participants reported mostly mild numbness in hand. They also found to have hand weakness and tingling sensation during working. The grasping and handling efficacy of instruments are affected mild in nature. They were also found to have mild difficulty in handling of forceps. This is in accordance with two studies undertaken on the same premise as ours ^[14-15].

Several studies have addressed CTS and reported its prevalence in dental profession, in particular dentist ^[16-18]. There were 21.2% of dentists in Kelantan, Malaysia, who had probable CTS ^[19]. A research done in Mangalore, India found that 20% of dentists have CTS ^[20]. Another study among Iranian dentists found that 16.7% of cases were CTS ^[21]. 15.5% of dentists in Lahore, Pakistan, had the entire prevalence ^[22]. The prevalence of CTS has increased as a result of the procedures done in some dental specialties ^[23]. Modern dentistry is often linked to cutting-edge technologies ^[24]. Introduction of novel tools and methods, which may be responsible for the emergence of fresh health issues.

CONCLUSION

The prevalence of Carpal tunnel syndrome is common and the onset of these disorders are found to be of greater prevalence among the dental students and assistants. It would be beneficial if proper ergonomics is applied and taught at an academic level of students to avoid severity as students are affected more. To inculcate preventive approach and factors to identify the early symptoms would make the diagnosis and treatment easy. By the current study we can conclude that early knowledge of CTS during the academic years and explain the occupational hazard related to it.

We can consider further studies on how the students who are facing the CTS are overcoming the problem and with advancement in technology and digitalization have we been able to overcome it.

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