ORIGINAL ARTICLE

EXPLORING DENTISTS' KNOWLEDGE AND PERSPECTIVES ON ORAL BIOPSIES AT BAQAI DENTAL COLLEGE, KARACHI

Samara Rais[1]*, Nauman Sheikh[2], Zarah Subhan[3], Qasim Saleem[4] Ayesha Azmat[5], Ramsha Tariq[6]

Abstract

Background: Oral biopsy is an essential diagnostic tool for identifying a range of oral lesions, from benign conditions to malignancies. Despite its significance, gaps in knowledge and practice among dentists may hinder its effective utilization, impacting patient outcomes.

Objectives: To evaluate dentists' knowledge, clinical practices, and perceptions regarding oral biopsy procedures and their role in diagnosing oral lesions.

Methods*:* A cross-sectional study was conducted among dental surgeons at Baqai Dental College in Karachi, where a validated questionnaire was distributed to 196 dental professionals of various designations. The questionnaire include 22 questions (8 open and 14 close-ended) which included 2 sections. The collected data was analysed using descriptive statistics with Statistical Packages for Social Sciences (SPSS) version 20 software.

Results: The study assessed the knowledge of participants regarding biopsies for diagnosing suspicious oral lesions. Out of 196 participants, 71 were house officers,59 were lecturers, 20 senior lecturers and 46 assistant/associate professors. Thus, it found that 96% of general dental practitioners (GDPs) believed biopsies were necessary for such diagnoses; with some considering them essential for premalignant, malignant, and cystic lesions, while others felt they were needed only for premalignant and malignant lesions. About 43% of participants were familiar with all biopsy methods. Reasons for not performing biopsies included difficulty in handling, lack of experience, decreased self-confidence, and insufficient patient compliance. Nearly all dentists acknowledged the need to improve their knowledge of oral lesions and biopsy techniques.

Conclusion: The study participants were aware of oral screening and biopsy procedures but hesitant to perform them. This suggests that General Dental Practitioners (GDPs) would benefit from dental education programs focused on oral precancerous and cancer detection, as well as screening and diagnostic techniques.

Keywords: Oral biopsy, dental surgeon/practitioner, lesion, diagnosis

[1*,3] Lecturer, Oral Pathology Department, BDC, BMU
[2] Professor and Head of Department Oral Pathology, BDC, BMU
[4] Senior Registrar, Oral Pathology Department, BDC, BMU
[5,6] General Dentist, BDC, BMU
Baqai Dental College (BDC), Baqai Medical University (BMU)

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INTRODUCTION

The term biopsy is originated from the Greek word which means vision of life. It was first introduced by Ernest Besnier in 1879 and the first biopsy was performed by M.M Rudnev in 1875 in Russia. It is the most reliable procedure as well as considered to be the gold standard for various oral diseases [1,2].

*Corresponding Author: Lecturer, Oral Pathology Department, Baqai Dental College, Baqai Medical University.
Email: samarakhan2017@baqai.edu.pk

Oral biopsy surgery is a common procedure in dental practice that involves theÊincision, excision or punch of oralÊmucosal tissueÊfor histopathological evaluation [3]. It must be highlighted that it is not only limited to diagnosis but is also greatly useful to determine the nature of the lesions present anywhere on lip/oral mucosa and for designing effective management strategies [4,5].

According to American cancer society there are three main types of oral biopsies which include: Excisional biopsy that is undertaken to remove small benign lesions, Incisional biopsy; performed for larger or suspicious lesions and fine needle aspiration biopsy (FNAC) that is indicated to diagnose cysts (such as: Dentigerous cyst, Eruption cyst, Lateral periodontal cyst, Gingival cyst), lymph nodes and disorders of the salivary glands [6-8].

The two-week rule recommended by World Health Organization for assessing and potentially biopsying suspicious oral lesions is a common guideline followed by healthcare professionals. It emphasizes the importance of promptly evaluating any persistent oral lesion that has not resolved within two weeks after the identification and elimination of local causal factors, such as traumaÊorÊinfection [9-11].

The purpose of a biopsy is to characterize a lesion based on its histopathological features, determine the prognosis for malignant or premalignant conditions, guide the prescription of targeted treatments, assist in evaluating treatment efficacy, and serve as a document with legal medical significance [3,12]. An innovative approach that examines biological fluids, mainly blood, to detect cancer-related biomarkers is referred to as liquid biopsy [13]. The application of LB for cancer screening, patient stratification, and monitoring has been well-documented, its significance in oral squamous cell carcinoma (OSCC) is particularly emphasized [14]. Besides blood, other bodily fluids such as urine, saliva, seminal fluid, pleural effusion, cerebrospinal fluid, sputum, and stool samples can also be utilized for LB [15].

The study aims to assess the knowledge and perceptions of dentists regarding oral biopsy. It seeks to integrate existing research in oral pathology and contribute to understanding the attitudes of general dental practitioners and specialists toward the practice of oral biopsy.

METHODS

A descriptive cross-sectional study was conducted from August 2021 to September 2022 to comprehend theÊ“knowledge, attitude, and practices of dentists towards oral biopsies in Baqai Dental College Karachi, Pakistan”. Ethical clearance was granted by the ethical committee, atÊBaqai Medical University. Informed Verbal consent was obtained from all the participants. A convenience sampling technique was used and 196 dental practitioners from Baqai Dental College were recruited which included house officers, lecturers, senior lecturers, assistant/ associate professors, and professors.

Individual house officers, lecturers, senior lecturer, assistant professors and professors are included in the study. Students and GD staffs are excluded from the study. The questionnaire included 22 questions (8 open and 14 close-ended) which included 2 sections. The first section of the questionnaire asked about the dental practitioner's demographic information, while the second half inquired about his or her knowledge, attitude, and practices regarding oral tissue biopsies. The sample size was calculated by Open Epi (version 3.01) keeping the % frequency of study outcome at 50% for most liberal estimate with 95% confidence level and 7% precision required. Data was stored in Microsoft Excel 2016, entered and analysed by IBM SPSS version 20.0. Data confidentially was ensured through password protection. The result was displayed in descriptive, tabular and graphical form, highlighting level of frequency. Chi square test was done to compare the frequencies between various groups.

RESULTS

Our study highlighted the investigation preferences of dentists when encountering a lesion in a patient’s mouth. Out of 196 participants included, 136

responded and 60 were missing/excluded. The majority of participants indicated that they would refer such cases to a surgeon or pathologist. Specifically, this response was given by 42 house officers, 50 lecturers/registrars, 12 senior lecturers/registrars, and 32 assistant professors/associate professors/professors, as detailed in Table 1.

Table 1: Visible Suspicious Lesions

Investigation Method	House Officer (n, %)	Lecturer/Registrar (n, %)	Senior Lecturer (n, %)	Assistant Professor/ Associate Professor/ Professor (n, %)	Total (n, %)
Refer to a specialist (oral surgeon/pathologist)	42 (30.8%)	50 (36.7%)	12 (33.3%)	32 (23.5%)	136 (69%)
Refer to a closet hospital diagnostic facility	6 (66.6%)	1 (11.1%)	0 (0%)	2 (22.2%)	9 (5%)
Perform biopsy on our own	16 (40%)	8 (20%)	8 (20%)	8 (20%)	40 (20%)
Never had a patient who require biopsy	7 (100%)	0 (0%)	0 (0%)	0 (0%)	7 (4%)
Any other (please specify)	0 (0%)	0 (0%)	0 (0%)	4 (100%)	4 (2%)

The majority of respondents (69%, n=136) preferred referring patients to specialists such as oral surgeons or pathologists, demonstrating a strong reliance on expert consultation for diagnostic certainty. This approach was particularly prevalent among lecturers/registrars (25.3%, n=50) and house officers (21.3%, n=42), while senior lecturers (6.1%, n=12) and professors (16.2%, n=32) contributed fewer responses. Only 5% (n=9) of the participants opted to refer patients to a nearby hospital diagnostic facility. Among these, house officers accounted for 3.0% (n=6), lecturers/registrars 0.5% (n=1), and professors 1.0% (n=2), suggesting this approach is less favored, possibly due to perceived inadequacies in hospital facilities or a preference for specialist care.

Performing biopsies independently was reported by 20% (n=40) of respondents, distributed fairly evenly across groups: house officers (8.1%, n=16), lecturers/registrars (4.0%, n=8), senior lecturers (4.0%, n=8), and professors (4.0%, n=8). This reflects a moderate level of confidence and capability in conducting biopsies among dental practitioners. A smaller proportion, 4% (n=7), indicated they had not encountered patients requiring a biopsy, with all responses from house officers (3.5%, n=7), highlighting their limited clinical exposure compared to more experienced practitioners. Finally, 2% (n=4) of participants, exclusively professors, reported using alternative methods, possibly indicating unique, experience-based approaches not typically practiced by others. Overall, the findings underscore a predominant preference for referring biopsy cases to specialists, pointing to potential gaps in training or confidence among dentists in independently performing such procedures.

Table 2: Dentists' Opinions on Lesions Requiring Biopsy

Lesion Type	House Officer (n, %)	Lecturer/Registrar (n, %)	Senior Lecturer (n, %)	Assistant Professor/ Associate Professor/ Professor (n, %)	Total (n, %)
Premalignant lesions only	6 (17.1%)	29 (82.8%)	0 (0%)	0 (0%)	35 (32%)
Benign lesions only	8 (100%)	0 (0%)	0 (0%)	0 (0%)	8 (4%)
Malignant lesions only	1 (50%)	1 (50%)	0 (0%)	0 (0%)	2 (1%)
Cysts only	3 (50%)	3 (50%)	0 (0%)	0 (0%)	6 (3%)
Premalignant and benign lesions	5 (50%)	0 (0%)	0 (0%)	5 (50%)	10 (5%)
Premalignant and malignant lesions	2 (20%)	2 (20%)	0 (0%)	6 (60%)	10 (5%)
Benign and malignant lesions	0 (0%)	0 (0%)	4 (66.6%)	2 (33.3%)	6 (3%)
Benign and cystic lesions	0 (0%)	4 (50%)	0 (0%)	4 (50%)	8 (4%)
Malignant and cystic lesions	4 (100%)	0 (0%)	0 (0%)	0 (0%)	4 (2%)
Benign, premalignant, and cystic lesions	17 (35.4%)	8 (16.6%)	0 (0%)	23 (47.9%)	48 (24%)
Premalignant, malignant, and cystic lesions	8 (44.4%)	4 (22.2%)	0 (0%)	6 (33.3%)	18 (9%)
Benign, malignant, and cystic lesions	2 (12.5%)	10 (62.5%)	2 (12.5%)	2 (12.5%)	16 (8%)

The table reveals varying perspectives among dentists regarding the types of lesions requiring biopsies. The most commonly identified category was "benign, premalignant, and cystic lesions," reported by 24% (n=48) of the respondents. This was followed by "premalignant lesions only" at 32% (n=35), primarily supported by lecturers/registrars. House officers displayed diverse responses, with notable contributions to most categories, reflecting a lack of consistency in their knowledge base. Senior faculty consistently emphasized cystic, premalignant, and malignant lesions requiring biopsies, indicating their refined diagnostic understanding.

Table 3: Concerns Regarding Biopsy in General Practice

Concerns	House Officer (n, %)	Lecturer/Registrar (n, %)	Senior Lecturer (n, %)	Assistant Professor/Associate Professor/Professor (n, %)	Total (n, %)
Practical skills	15 (45.4%)	10 (30.3%)	4 (12.1%)	4 (12.1%)	33 (17%)
Patient's cooperation	19 (32.2%)	16 (27.1%)	8 (13.5%)	16 (27.1%)	59 (30%)
Future patient care	7 (30.4%)	8 (17.3%)	2 (8.69%)	6 (26.0%)	23 (12%)
Fixation/transportation	9 (20.4%)	16 (36.3%)	3 (6.8%)	16 (36.3%)	44 (22%)
Not well paid	21 (56.7%)	9 (24.3%)	3 (8.1%)	4 (10.8%)	37 (19%)

"Patient's cooperation" emerged as the most significant concern, reported by 30% (n=59) of respondents, with assistant professors/professors and house officers expressing similar levels of concern. Issues related to "fixation and transportation" were also prominent (22%, n=44), particularly among senior faculty. Practical skills were a concern for 17% (n=33), mostly among house officers (7%, n=15). A notable 19% (n=37) expressed dissatisfaction with remuneration for biopsy procedures. These findings suggest a blend of technical, logistical, and motivational challenges faced by dental practitioners.

Table 4: Frequency and Percentage of Dental Practitioners Regarding Practical Skills, Patient's Cooperation, and Biopsy Updates

Aspects	Frequency (n)	Percentage (%)
Practical skills		
Yes	107	55%
No	89	45%
Patient's cooperation		
Yes	68	35%
No	128	65%
Do you update yourself regarding biopsy?		
Yes	146	74%
No	50	26%

Table 4 highlights that 55% (n=107) of dental practitioners feel confident in their biopsy skills, while 45% (n=89) do not, indicating a gap in proficiency. A significant 65% (n=128) face challenges with patient cooperation during biopsies, while only 35% (n=68) report receiving cooperation. In terms of continuing education, 74% (n=146) actively update their knowledge on biopsy techniques, but 26% (n=50) do not, suggesting opportunities for improving ongoing training. These results point to strengths in education and skill development but also reveal barriers in patient cooperation and areas for further professional growth. In figure 1, the bar chart illustrating the interpretation of biopsy reports across different groups of dental practitioners. The chart shows the frequencies of "Yes" and "No" responses for each group: House Officers, Lecturers/Registrars, Senior Lecturers, and Assistant Professors/Associate Professors/Professors. This visual representation helps compare the distribution of responses within each group. ?

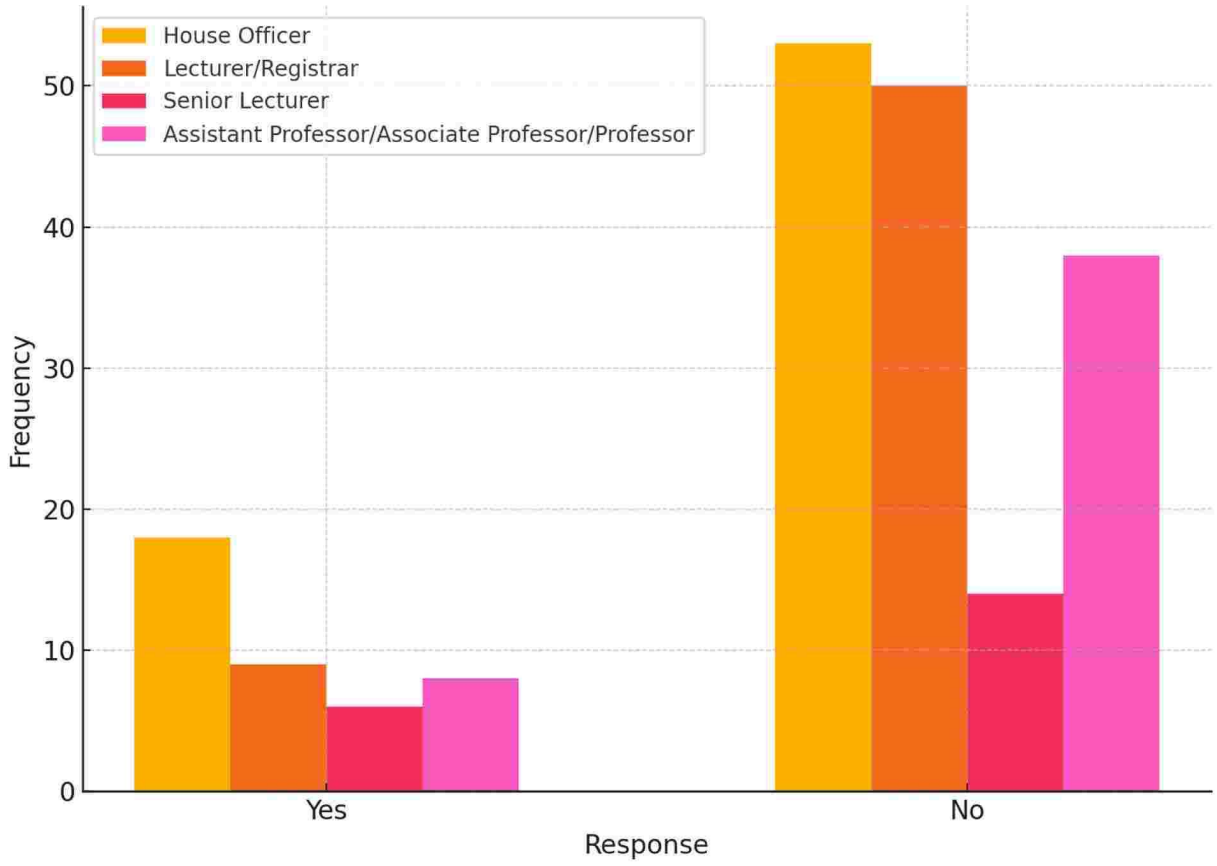

Figure 1: Interpretation of Biopsy Report

The bar chart illustrates the responses regarding the interpretation of biopsy reports among different groups of dental practitioners. The majority of practitioners across all categories, including House Officers, Lecturers/Registrars, Senior Lecturers, and Assistant Professors/Associate Professors/Professors, answered "No," indicating a lack of confidence or experience in interpreting biopsy reports. Specifically, 79% of House Officers, 84.7% of Lecturers/Registrars, 70% of Senior Lecturers, and 83% of Professors/Associate Professors/Assistant Professors reported not interpreting biopsy reports. While a small proportion of House Officers (21%), Senior Lecturers (30%), and Professors (17%) answered "Yes," the general trend suggests that most dental practitioners do not feel confident in this aspect of their practice.

Table 3: Comparison of mean attitude scores about COVID-19 booster dose with demographic and COVID-19 related factors among medical students

Questions	Male (n, %)	Female (n, %)	p-value
Average number of patients examined in a month?			
Less than 20 patients	9 (16.2%)	16 (22.6%)	0.04
20-50 patients	8 (14.5%)	20 (28.2%)	
51-100 patients	16 (29%)	8 (11.3%)	
More than 100	4 (7.3%)	3 (4.2%)	
For any visible suspicious lesion, what comes first to your mind regarding investigations?			
Refer to a specialist (oral surgeon/pathologist)	23 (41.8%)	38 (53.5%)	0.38
Refer to a closest hospital diagnostic facility	2 (3.6%)	2 (2.8%)	
Perform biopsy on our own	10 (18.2%)	10 (14.1%)	
Never had a patient who required biopsy	1 (1.8%)	2 (2.8%)	
After removal of a lesion, what do you suggest?			
Always send it for analysis	28 (50.9%)	40 (56.3%)	0.54
Send it for analysis only when required	8 (14.5%)	11 (15.5%)	
No need to send it for analysis after removal	2 (3.6%)	1 (1.4%)	
How often do you expect an oral lesion to arrive which may require biopsy?			
At least once a week/month	18 (32.7%)	24 (33.8%)	0.848
At least once a year	14 (25.5%)	20 (28.2%)	
At least once in 5 years	3 (5.5%)	4 (5.6%)	
Never had a patient who required biopsy	4 (7.3%)	3 (4.2%)	
Which types of biopsy methods are you aware of?			
Incisional biopsy only	7 (12.7%)	9 (12.7%)	0.526
Excisional biopsy only	5 (9.1%)	12 (16.9%)	
Fine needle aspiration (FNA) only	1 (1.8%)	3 (4.2%)	
Incisional and excisional biopsy	2 (3.6%)	4 (5.6%)	
Incisional and fine needle aspiration (FNA)	1 (1.8%)	1 (1.4%)	
Excisional and fine needle aspiration (FNA)	0 (0%)	2 (2.8%)	
Incisional, Excisional, and fine needle aspiration (FNA)	23 (41.8%)	21 (29.6%)	

The table compares the responses of male and female dental practitioners regarding various biopsy-related practices. For the question about the average number of patients examined in a month, a higher percentage of females (22.6%) reported examining fewer than 20 patients, compared to 16.2% of males. On the question about investigations for suspicious lesions, a larger proportion of females (53.5%) prefer referring patients to specialists, compared to 41.8% of males. When asked about sending removed lesions for analysis, 50.9% of males and 56.3% of females always send lesions for analysis, while others do so only when required or not at all. Regarding the frequency of oral lesions requiring biopsy, there was little variation between males (32.7%) and females (33.8%) expecting such lesions at least once a week or month. For the question about biopsy methods awareness, 41.8% of males and 29.6% of females were aware of incisional, excisional, and fine needle aspiration biopsies. The p-values and Fisher's Exact Test Values indicate the statistical significance of gender differences in the responses. For example, the question about the average number of patients examined showed a statistically significant difference with a p-value of 0.04, suggesting gender-based variation in patient exposure. However, other questions, like biopsy methods awareness, showed no significant gender differences.

DISCUSSION

Performing a biopsy in the oral cavity is well within the capabilities and expertise of General Dental Practitioners (GDPs). GDPs that choose to carry out biopsies in their clinics should have a thorough understanding of the various biopsy techniques, the nature of the lesions, and the appropriate criteria for selecting patients. Misconceptions about biopsies may discourage some GDPs from recommending the procedure to certain patients, potentially reducing the likelihood of patient acceptance [16].

Identifying and treating oral lesions can greatly help dental practitioners improve patients' oral health, prevent disease progression, and enhance their quality of life, leading to a better prognosis. However, even though most dentists prefer sending biopsy patients to a specialist or higher center, SOME consider that routine biopsies are within the purview of a GDP because they allow immediate access to prompt therapy. When it comes to diagnosing oral lesions [17,18]. GDPS with a degree in dentistry were surveyed in this study, the result of our research indicates similar findings as analysed by Murgod et al that majority of the dentists were well aware regarding biopsy as a diagnostic tool and holds a great importance for distinguishing and differentiating various oral lesions [19,20].

Out of 196 dental surgeons surveyed, 74% (145) always send suspected lesions for analysis, 20% (40) perform biopsies themselves, and 4% [7] (7) have never had a patient who required a biopsy. This data manifest their sufficient knowledge and awareness that questionable lesions demand biopsy. Else via, it will end up as great trouble due to delayed diagnosis emerging as severe morbidity and mortality [21]. A study conducted in Nepal in 2020 regarding dental surgeons and their experiences with lesions requiring biopsy. The study found that a majority of dental surgeons (96.2%) encountered such lesions, but only a small percentage (7.5%) had performed biopsies, mainly due to a lack of experience. In our study, approximately 20% (n=40) had performed biopsies, suggesting slightly raised pattern of limited experience in conducting biopsies among dental surgeons.

This was more as compare to other studies done by Diamanti et al, Murgod et al and Anandani et al, who reported 15%, 14.9%, and 11.3% respectively whereas less than Jornet et al, Wan and Savage which was 21% and 22.7% correspondingly of the general dental practitioners. Those who preferred to either refer to specialist or refer to higher center were 74% (n=145) and in other studies by Diamanti et al, Murgod et al., Anandhani et al, Wan and Savage reported 55%, 64.67%, 50.8% , 76.2% respectively [19,21].

Further, most of the participant were well informed of all the methods for biopsy mentioned in Murgod et al, although our investigation revealed that 74%

(n = 146) were up to date. It is essential to consider that various types of biopsy possess different pros and cons highlighting specific cases. When dentists were inquired about interpretation of reports of biopsies, 79% of dentists including house officer, lecturers, senior lecturers, while Professors were found to be unable to interpret a Biopsy report [19].

Whether the tissue that is removed has to be sent for histopathological examination or not is debatable. Though, Response of our study disclosed that every clinical dental practitioners have come across at least one lesion in their practicing career that require biopsy procedure [21] but most still do not perform it on their own, mainly due to in-adequate experience and education regarding the approach, which emphasizes the need for higher levels of importance to be placed on this aspect in undergraduate and postgraduate dental curriculum. Organization of specific training or continuing dental education programs to provide dental practitioners with the experience and practical skills necessary to carry out these procedures safely and confidently [20].

CONCLUSION

Oral health practitioners often encounter both hard and soft lesions in the oral cavity, but diagnosing these lesions accurately remains challenging. A study revealed a significant gap between dental professionals' theoretical knowledge of oral biopsy and its actual clinical application. This highlights the need for ongoing education and training in oral biopsy techniques. As the understanding of oral lesions and their management evolves, dental professionals must stay updated on the latest diagnostic methods and patient selection criteria. Regular training can boost practitioners' confidence in performing biopsies, improving patient outcomes and enabling earlier detection of oral diseases. Continuous education will also help address misconceptions and barriers to biopsy; ensuring practitioners can make informed decisions and provide optimal care.

Conflict of Interest: None

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Authors' Contribution

SR: Concept & design, statistical analysis, editing of manuscript, responsible for integrity of research

NS: Data collection and manuscript writing

ZS: Edited, manuscript editing, review and final approval of manuscript

QS: Statistical analysis, editing of manuscript, review and final approval of manuscript

AA: Edited, manuscript editing, review and final approval of manuscript

RT: Edited, manuscript editing, review and final approval of manuscript

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