








Original Article

## Effect of education on perception of patients regarding dental treatment and oral hygiene practices during Ramadan.

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### Abstract

**Background:** Fasting places prohibitions on eating and drinking for a certain period. Although many dental treatments have been said to be safe and can be performed while fasting, others may break the fast. The study aims to evaluate the perception of dental patients regarding the effect of such treatments and hygiene measures during fasting.

**Methodology:** A cross-sectional survey was carried out in two dental teaching hospitals of Lahore, Pakistan. A self-administered structured questionnaire was developed to assess the knowledge and perception of patients regarding dental treatments and hygiene practices while fasting. The chi-squared test was used to observe differences between knowledge amongst gender, occupation and education status. Moreover, multinomial regression analysis was performed to assess the relationship between these variables.

**Results:** Among 374 responses, about 76.2% of respondents believed that undergoing extraction broke fast. Scaling thought to nullify the fast by 45.5%. 52.9% perceived root canal treatment (RCT) to break the fast, along with 67.6%, who believed anesthesia administration broke fast. Brushing was reported to break the fast by 57.5%, with mouthwash invalidating fast by 63.4%.

**Conclusion:** Most respondents thought most oral hygiene measures broke the fast, whereas responses were split regarding procedures where few were perceived to break the fast, and the rest did not.

### Keywords

Fasting, Oral Hygiene, Dental Treatment, Root Canal Treatment



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## Introduction

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Fasting is an obligatory practice in Islam during the month of Ramadan<sup>1</sup>. One of the fundamentals of fasting is refraining oneself from consuming any food or drink during the fasting hours. Although traditions may vary according to geographical location, customs are generally influenced by religion, especially in regions like the Middle East and Southeast Asia. This phenomenon is reflected in people having the same thought process, as the same ideology leads them. As per Islamic teachings, people who are unwell, elderly and travelling are not covered under the same umbrella of compulsory fasting<sup>2</sup>. It also includes women who are menstruating, pregnant, new mothers and lactating. Therefore, such individuals have the right to be excused from fasting, which can be performed later<sup>3,4</sup>.

Fasting applies some restrictions on the Muslims who observe it in terms of what could potentially break a fast. These limitations include ingesting any solid or intake of a minute quantity of water, nullifying the fast. This places patients and healthcare professionals in a predicament where patients will have to ascertain the type of medication they can take before or after fasting and any diagnostic test or medical/dental procedure. Moreover, practitioners will also have to consider modifications in treatment plans and medication timing not to hinder the obligation of performing fast. As far as dental procedures are concerned, it can be assumed that the general population is relatively unfamiliar with the ramifications of different treatments on fasting. This can be inferred from the fact that most people inquire about the effect of oral hygiene practices such as brushing and use of mouthwash on fasting<sup>5</sup>. Also, the ratio of attending dental appointments has been documented to decline during Ramadan, which delays the treatment and may lead to poor oral health outcomes as well<sup>6,7</sup>. It can only be expected that they will have little knowledge about proper dental treatments during Ramadan.

Thus, information about the patients' cultural and religious rituals is of great importance for

healthcare professionals, as this knowledge will result in the gratification of patients regarding dental healthcare delivery<sup>3</sup>. Therefore, this study aimed to assess the patients' level of awareness regarding the types of treatments and oral hygiene practices permissible during fasting.

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## Methodology

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A cross-sectional survey was carried out in two dental teaching hospitals of Lahore, Pakistan, namely University College of Dentistry and De'Montmorency College of Dentistry, from September to October 2018. Institutional ethical approval was obtained before commencement of the study (IRB/Ref: UCD/ERCA/18/01a). The sample size was calculated using an online Raosoft sample size calculator<sup>8</sup> with population size (43,200) projected as approximate annual visitors in OPD of both dental teaching hospitals. Keeping margin of error 5% and confidence interval 95%, the minimum sample size was estimated to be 321, considering the response rate to be 70%. Convenience sampling technique was used to disseminate the questionnaires.

A self-administered structured questionnaire was developed to assess the knowledge and perception of patients regarding dental treatments and hygiene practices while fasting. The questionnaire was validated by subject specialists and then piloted with a sample of 40 patients. Reliability was measured through Cronbach's alpha coefficient, which was 0.78.

The first section of the questionnaire focused towards dental treatments such as filling and scaling etc., on fasting. The second part of the questionnaire consisted of 3 items asking the participants whether hygiene measures such as brushing and mouthwash, and miswaak affects on fasting. The collected data was analyzed using SPSS version 23.0. quantitative variables are represented as frequencies and percentages. The chi-squared test was used to observe differences between knowledge amongst gender, occupation and education status. Moreover, multinomial regression analysis was performed to assess the relationship between these variables. All p-values

were two-tailed, and the significance was defined at  $p < .05$ .

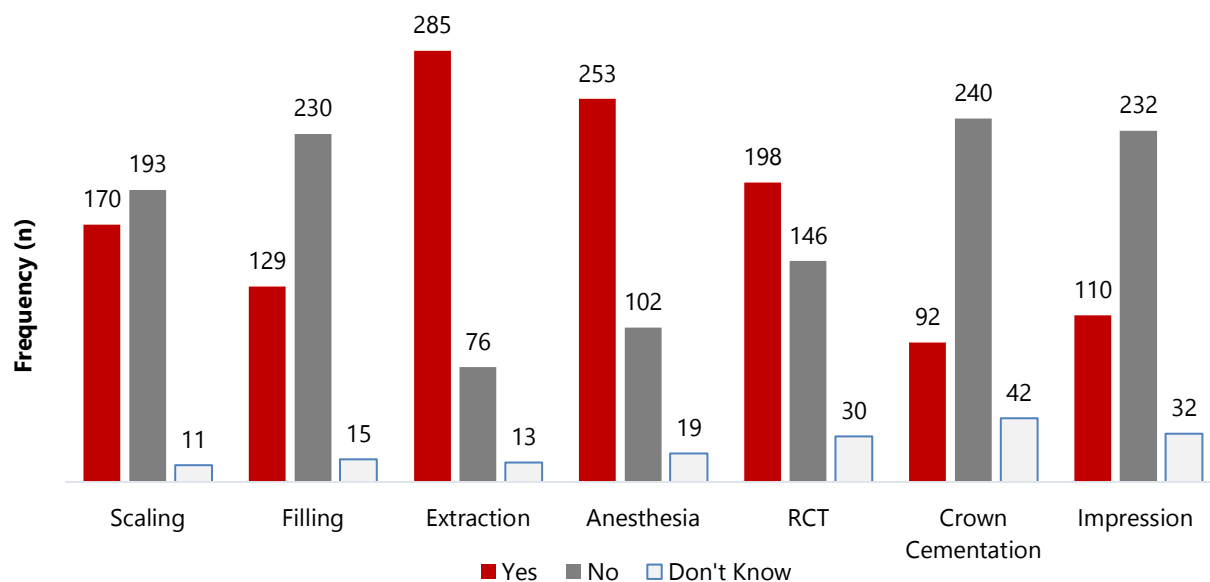
## Results

A total of 415 responses were obtained out of 600 distributed, of which 41 were excluded due to being incomplete. The total sample included in the analysis was 374. The summary of demographic

variables is displayed in table 1. The majority of the participants were male, though much difference wasn't observed between genders as female participants formed almost half of the total count. Most (68.7%) participants had completed their college degree, followed by educated participants until primary or high school graduates (31.3%). The majority of the participants were employed (55.9%), with only 21.9% being unemployed.

**Table 1: Demographic data of the studied population.**

| Variable                    | n(%)             |           |
|-----------------------------|------------------|-----------|
| <b>Gender</b>               | Male             | 197(52.7) |
|                             | Female           | 177(47.3) |
| <b>Age; years (Mean±SD)</b> | 29.4±11.5        |           |
| <b>Education status</b>     | Primary          | 35(9.4)   |
|                             | Secondary        | 82(21.9)  |
|                             | Higher Secondary | 257(68.7) |
| <b>Occupation</b>           | Students         | 83(22.2)  |
|                             | Professional     | 117(31.3) |
|                             | Businessmen      | 30(8)     |
|                             | Casual workers   | 62(16.6)  |
|                             | Unemployed       | 82(21.9)  |



**Figure1: Respondents view of dental treatments that breakfast**

The overwhelming majority of respondents thought induction of anesthesia (67.6%) and extraction procedure (76.2%) broke fast. More than half (52.9%) of the respondents assumed RCT to break the fast. Although the majority perceived scaling not to break the fast, many (45.5%) of the respondents' views were in contrast.

Table 2 summarizes the differences in responses of the sample population according to education level as demonstrated by the Chi-squared test. Amongst school graduates, the majority perceived dental procedures to break the fast, whereas most college graduates thought otherwise. Procedures of scaling, impression taking and crown cementation were not assumed to break the fast by both college and school graduates. According to most college-educated respondents (77.8%), the filling was not considered to break the fast, while most (45.7%) school graduates believed the procedure broke fast.

**Table 2: Association of education and dental procedures likely to break the fast**

| Variables                              | Education n(%) |             | p-value |
|--|----------------|-------------|---------|
|  | College Degree | High School |         |
| <b>Scaling</b>                         | Yes            | 120(46.7)   | 0.21    |
|  | No             | 132(51.4)   |         |
|  | Don't know     | 5(1.9)      |         |
| <b>Filling</b>                         | Yes            | 70(27.2)    | <0.01*  |
|  | No             | 178(69.3)   |         |
|  | Don't know     | 9(3.5)      |         |
| <b>Anesthesia</b>                      | Yes            | 159(61.9)   | <0.01*  |
|  | No             | 85(33.1)    |         |
|  | Don't know     | 13(5.1)     |         |
| <b>RCT</b>                             | Yes            | 129(50.2)   | <0.01*  |
|  | No             | 119(46.3)   |         |
|  | Don't know     | 9(3.5)      |         |
| <b>Extraction</b>                      | Yes            | 189(73.5)   | 0.09    |
|  | No             | 60(23.3)    |         |
|  | Don't know     | 8(3.1)      |         |
| <b>Impression</b>                      | Yes            | 81(31.5)    | <0.01*  |
|  | No             | 165(64.2)   |         |
|  | Don't know     | 11(4.3)     |         |
| <b>Crown cutting &amp; cementation</b> | Yes            | 58(22.6)    | <0.01*  |
|  | No             | 181(70.4)   |         |
|  | Don't know     | 18(7)       |         |

\*p<0.05 is considered significant

Multivariate analysis depicted responders with high school education were 2.4 times more likely to think that procedure of filling broke fast (OR=2.4, 95% CI 1.50 – 3.91, p<0.001). Similar results were reported in the case of anesthesia induction as well, where high school graduates were 2.3 times more likely to believe in procedure breaking fast (OR=2.3, 95% CI 1.25 – 4.24, p=0.007).

As far as gender is concerned, multivariate analysis revealed that female responders were 45% less likely to believe that the filling procedure broke the fast (OR=0.55, 95% CI 0.34 – 0.90, p=0.018). Likewise, females were 53% less likely to perceive crown cementation to break the fast than those who did (OR=0.476, 95% CI 0.28 – 0.80, p=0.005).

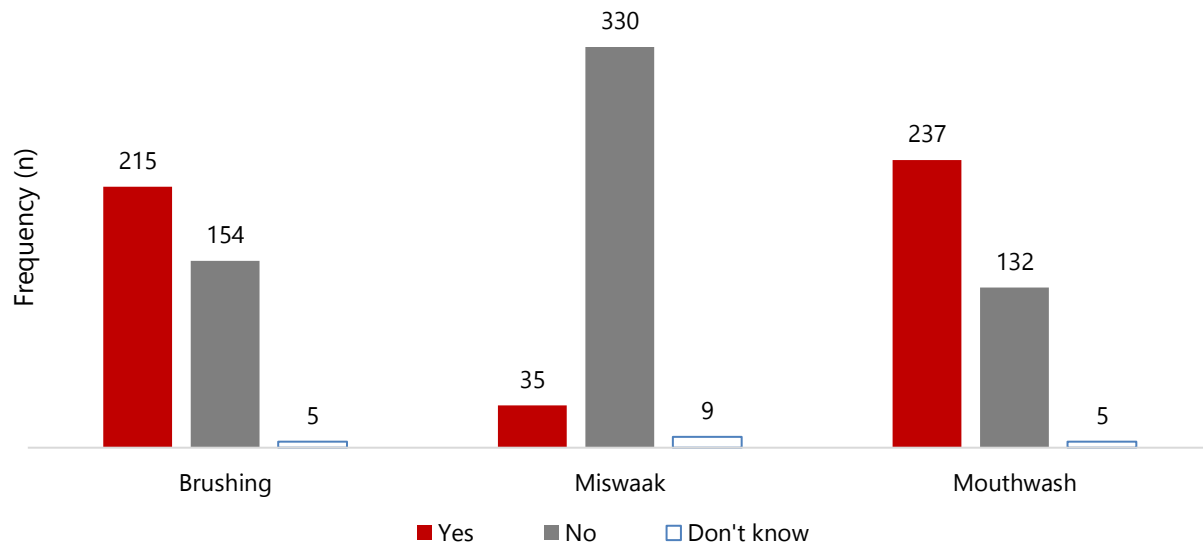
The results revealed that unemployed responders and high schoolers perceived RCT procedure which breaks the fast than others (OR=1.8, 95% CI 1.13 – 2.88, p=0.013 and OR=2.1, 95% CI 1.24 – 3.64, p=0.006 respectively). Unemployed responders were also 1.82 times more likely to perceive that impression-taking breaks fast (OR=1.82, 95% CI 1.12 – 2.96, p=0.014). Similarly, it was also found that a one-unit increase in age resulted in a 1.036-unit increase in believing that tooth extraction breaks the fast as compared to others (OR=1.036, 95% CI 1.004 – 1.068, p=0.025).

**Table 3: Predictors of breaking the Fast according to the perception of patients**

| <b>Variables</b>                               | <b>OR (95% CI)</b>   | <b>p-value</b> |
|--|----------------------|----------------|
| <b>Filling as dependent variable</b>           |                      |                |
| High school education                          | 2.4 (1.50 – 3.91)    | 0.000*         |
| Middle school education                        | 0 <sup>b</sup>       | -              |
| Female   | .55(0.34 – 0.90)     | 0.018*         |
| Male   | 0 <sup>b</sup>       | -              |
| <b>Anesthesia as dependent variable</b>        |                      |                |
| High school education                          | 2.3(1.25 – 4.24)     | 0.007*         |
| Middle school education                        | 0 <sup>b</sup>       | -              |
| <b>Crown cementation as dependent variable</b> |                      |                |
| Female   | .476(0.28 – 0.80)    | 0.005*         |
| Male   | 0 <sup>b</sup>       | -              |
| <b>RCT as dependent variable</b>               |                      |                |
| High school education                          | 2.1(1.24 – 3.64)     | 0.006*         |
| Middle school education                        | 0 <sup>b</sup>       | -              |
| Unemployed patients                            | 1.8(1.13 – 2.88)     | 0.013*         |
| Employed patients                              | 0 <sup>b</sup>       | -              |
| <b>Impression taking as dependent variable</b> |                      |                |
| Unemployed patients                            | 1.82(1.12 – 2.96)    | 0.014*         |
| Employed patients                              | 0 <sup>b</sup>       | -              |
| <b>Tooth Extraction as dependent variable</b>  |                      |                |
| Age  | 1.036(1.004 – 1.068) | 0.025*         |

\*p<0.05 is considered significant

Overall, high school graduates were likely to consider procedures to break the fast, and the female gender was associated with good knowledge of which procedures broke fast. The participants were also asked about their views concerning the dental hygiene practices during fasting and if they thought they could potentially break their fast (Figure 2).



**Figure 2: Perception of oral hygiene practices breaking the fast.**

As far as maintaining oral hygiene was concerned, the majority of respondents (57.5%) of both educational backgrounds perceived brushing to break the fast ( $\chi^2=9.62$ ;  $p\leq 0.01$ ).

A significant difference was only observed amongst gender and use of miswaak ( $\chi^2=8.21$ ;  $p=.01$ ), where females were likely to assume that use of miswaak did not breakfast (OR=9.4, 95% CI 1.11 – 79.45,  $p=0.04$ ). Conclusively, the majority of respondents believed brushing teeth and using mouthwash to break the fast. The overwhelming majority (88.2%) did not associate the use of miswaak with the breaking of fast. High schoolers were more likely to believe that brushing breaks the fast with an odds of 2.35 (95% CI 1.42 – 3.88,  $p=0.001$ ).

**Table 4: Oral hygiene practices perceived to be associated with breaking the fast.**

| Variables                                   | OR (95% CI)        | p-value |
|---|--------------------|---------|
| <b>Miswak as dependent variable</b>         |                    |         |
| Female                                      | 9.4 (1.11 – 79.45) | 0.04*   |
| Male  | 0 <sup>b</sup>     | -       |
| <b>Brushing Teeth as dependent variable</b> |                    |         |
| High school education                       | 2.35(1.42-3.88)    | 0.001*  |
| Middle school education                     | 0 <sup>b</sup>     | -       |

## Discussion

This study aimed to evaluate the perception of dental patients concerning the influence of dental treatment on fasting. Overall, many respondents thought that undergoing dental treatments did not invalidate fast though, oral hygiene practices broke fast. Procedures like scaling and filling were not

considered to nullify fast by many. Since the use of rubber dam is common nowadays than it was previously, patients may be aware that it eliminates the risk of intake of any kind of liquid during filling and root canal treatments. In contrast, most of them thought that induction of anesthesia would invalidate the fast as they may perceive the introduction of anesthetic material in oral tissues to

break the fast which was not in line with the findings of the study reported that injecting anesthesia is an acceptable procedure for dental treatment during fasting<sup>9-11</sup>. As per the Islamic fatwa's by many Muslim scholar's, for dental treatment, local anesthesia administration does not break the fast<sup>7</sup>. Also, it is generally assumed that any inoculation breaks the fast. To tackle this sensitive issue, Islamic rulings were pronounced by scholars that administration of local anesthetics will not invalidate fast; only nutritional IV injections are not permitted during fasting<sup>6</sup>. Although, it is doubtful if the patients are aware of any such ruling.

As far as maintaining oral hygiene is concerned, most respondents considered mouthwash and tooth brushing to break the fast. This could be due to flavouring agents in toothpaste and mouthwash as consumption of flavorful components during fast is prohibited. However, using miswaak was not thought to be associated with breaking fast. Miswaak is a tiny twig of a plant rubbed against the surfaces of teeth for cleaning. The twig is reported to have some anti-microbial and plaque inhibitory effects<sup>9</sup>. Different scholars have documented conflicting opinions where one school of thought suggests not brushing teeth during the fasting state, though others have set a condition. It was proposed that a tiny amount of toothpaste can be used to brush the teeth while fasting, ascertaining that the paste is not swallowed and spit out immediately<sup>9,10</sup>.

Overall, females were more aware of the impact of dental treatments and dental hygiene practices on fasting states than males. While there were more males in the study, more females were educated till bachelor level. This could explain females' more educated responses compared to males as they were more educated and informed. Also, college-educated respondents had relatively better awareness of procedures that did not break the fast as compared to school graduated respondents. Similar results were observed in another study conducted in Malaysia where educated people were likely to be more knowledgeable about the effect of dental treatments on fasting<sup>10</sup>.

This study holds importance, especially amongst the Muslim community, since this domain hasn't been well researched. It can also be assumed that the results are generalizable to the Muslim population anywhere as external validity was assured by devising inclusion/exclusion criteria and collecting data at the same timing. In places where Muslims are a minority, this could prove to be helpful in understanding the knowledge and attitude of people who are fasting, as people often tend to miss appointments during Ramadan and, even if they attend, usually do not undergo any form of treatment<sup>7</sup>. The study also emphasizes the importance of information regarding patients available to the dentist. For example, a study conducted amongst Muslims in India depicted that most of the respondents believed using eye drops during Ramadan would break their fast<sup>11</sup>. On the contrary, no evidence exists that reinforces this notion, as the medicine is not taken orally. Moreover, the respondents indicated that they would not take medicine in case of emergency as well. This implies that people who fast could be noncompliant with medications<sup>11</sup>.

It is important that dentists themselves should be updated with the religious affiliation of patients and the latest rulings about dental treatments and medication. This avoids any inconvenience during treatment as patients may not visit their dentist even in an emergency in fear of breaking their fast<sup>12</sup>. Also, the dentists should ascertain that the patients are informed about the rulings, such as the Islamic Fiqh Council and the Standing Committee for Academic Research and Issuing Fatwas. This Saudi Arabian organization issues decrees in Islamic jurisprudence<sup>12-16</sup>. One possible limitation associated with the study is that it could have benefited from including people living in rural areas since their views may have differed. To know the level of understanding about certain aspects associated to daily life medical problems while being in religious boundary in terms of sorting out these issues is very important as due to the low literacy rate in Pakistan, there are numerous myths associated with allowed treatment during fasting. This research study will be a pioneer in exploring the understanding of patients about the religious



boundary with regards to various dental treatments. It will raise an important agenda about educating people at religious level related to health concerns with respect to fasting. So, it will be of significant worth.

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## Conclusion

In conclusion, although respondents in the sample were aware of few treatments being permissible during fasting, they had little knowledge about effect of treatments such as extraction, RCT and anesthetic induction during fast. They were also relatively uninformed of the influence of oral hygiene practices. Further research is recommended to determine treatments and practices that are allowed during fasting.

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## Conflicts of Interest

The authors have declared that no competing interests exist.

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