

Assessment of Awareness of Post Orthodontic Retention among Medical Students: A Questionnaire Study

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Abstract:-

Objective: This cross-sectional study aimed to explore the level of knowledge and expectations among medical students deciding on a future orthodontic treatment have about post-orthodontic retention and to investigate the influence of socio cultural characteristics.

Material and methods: A total of 166 consecutive medical students involved as legal decision maker for a prospective orthodontic treatment received before their first appointment a questionnaire to assess their knowledge and expectations about post-orthodontic retention. Data were analysed descriptively, whereas predictors were identified with logistic regressions at P value of less than or equal to 0.463

Results: Among the 166 responders, 86.3 per cent (n = 147) knew that retention appliances are used after orthodontic treatment and 69.9 per cent (n = 116) believed perfect results can guarantee stability, whereas at the same time, 75.9 per cent (n = 126) knew that teeth can move on their own without any orthodontic appliances. The majority considered stability of the orthodontic result important or extremely important (69.3 per cent; n = 115), preferred removable over bonding retainers (60.2 per cent; n = 100), believed the patient to be primarily responsible for a stable result (48.2 per cent; n = 80), and found it appropriate to charge for recall visits (63.3 per cent; n = 105).

Conclusions: Although stability of orthodontic treatment results is very important to people deciding about a prospective orthodontic treatment, knowledge regarding the need for post orthodontic retention varies and may at times be contradictory.

I. INTRODUCTION

The significance of retaining tooth alignment after orthodontic treatment to prevent relapse was identified as early as 1904⁽¹⁾, and its clinical importance has been emphasized since the 1980s–1990s^(1–5). Although it has become an undisputed fact that orthodontic patients are in need of some type of physical retention of achieved tooth movement after completion of treatment, orthodontists still debate about the benefits and drawbacks of different retention appliances and protocols⁽⁶⁾.

Several studies have been performed over the last years aiming to assess the level of knowledge or the prevailing preferences of dentists and orthodontists in particular, concerning orthodontic retention. These surveys have been conducted in numerous countries, including Australia⁽⁷⁾, Ireland⁽⁸⁾, Lithuania⁽⁵⁾, Malaysia⁽⁹⁾, the Netherlands^(10, 11), New Zealand⁽⁷⁾, Saudi Arabia⁽¹²⁾, Switzerland^(13–15), the UK⁽¹⁶⁾, the USA^(17–19), and Norway⁽²⁰⁾, and have all contributed to the current understanding of how orthodontic retention is being approached by clinicians.

In stark contrast to the established evidence of the orthodontists' level of knowledge and preferences in orthodontic retention, far less is known about prospective patients' concerns, expectations, and level of knowledge in this field. Several studies have assessed patients' expectations on orthodontic treatment in general⁽²¹⁾, but orthodontic retention per se has apparently never been subject of any scientific investigation.

The seeming paucity of evidence regarding prospective patients' awareness of post-orthodontic retention issues is disturbing. The necessity to understand the expectations and assess the level of knowledge of people interested in an orthodontic treatment is accentuated by the fact that post-orthodontic satisfaction is strongly related to the patients' perception of tooth stability and responsibilities during the retention phase⁽²⁾.

The aim of this study was, therefore, to assess the level of knowledge and the expectations concerning post-orthodontic retention of people enrolled for an orthodontic treatment, before their first orthodontic appointment or assessment.

II. METHOD

• Study design and participants :

A self-developed and anonymized questionnaire was distributed to medical students more than 16 years of age. Questionnaire was handed out consecutively to medical students (non-selective process) by a dental assistant not involved in the study, to be filled anonymously. All participants were briefed about the goal of this survey, its voluntary basis, and its anonymized design. The participants were instructed to fill out the questionnaire silently and independently, without time restriction.

The questionnaire consisted of 2 sections of closed ended queries: Items concerning the participant’s knowledge about post-orthodontic retention need, and items focusing on the participant’s attitude and expectations toward orthodontic retention. Piloting the survey was specifically done to identify items that lack clarity. After evaluation of this preliminary data, no subsequent alterations were deemed necessary. The questionnaire was distributed to all consecutive students who were about to have their first orthodontic appointment and who had agreed to participate. Data collection was performed between January and June 2021.

where, $Z_{1-\alpha/2} = 2.58$ AT 99% CONFIDENCE INTERVAL $d =$ ABSOLUTE ERROR OR PRECISION-0.10, $p=0.463$ SUBSTITUTING THE VALUES, WE GET $n = 165.3$

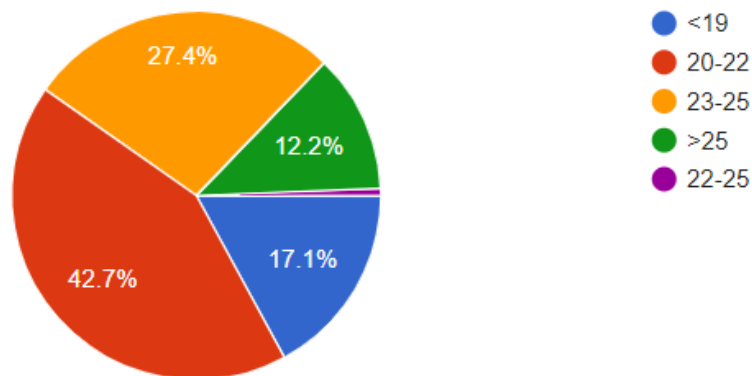
Therefore the total sample size is 166.

III. RESULTS

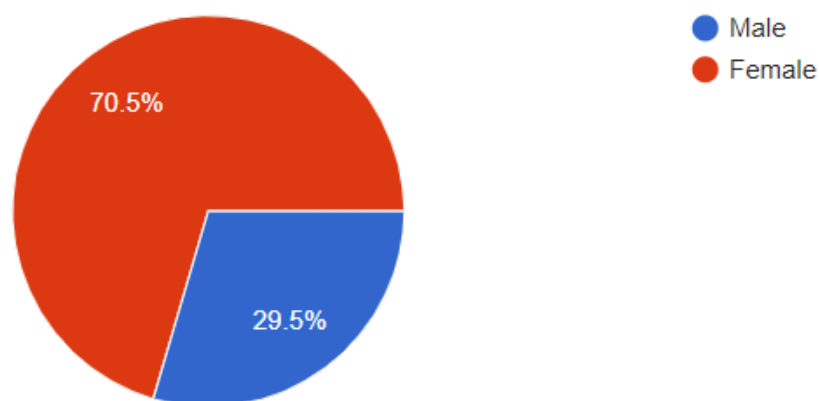
A total of 166 questionnaires were distributed to prospective orthodontic patients (medical students),all were filled out and returned. Every question was answered by the participants as instructed except the age, and therefore the number of the evaluated answers to each specific question varied from 164 to 166 of the total 166. The final response rate at question level ranged correspondingly from 99 per cent to 100 per cent.

Sample size was estimated by using the formula,

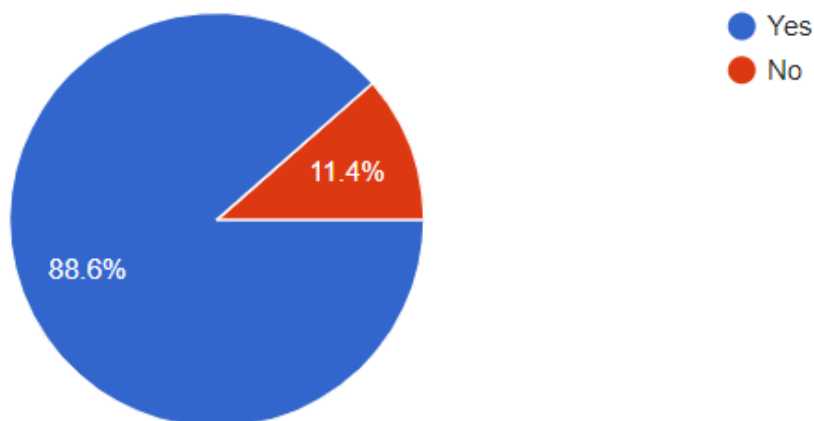
$$n = \frac{Z_{1-\alpha/2}^2 p(1-p)}{d^2}$$



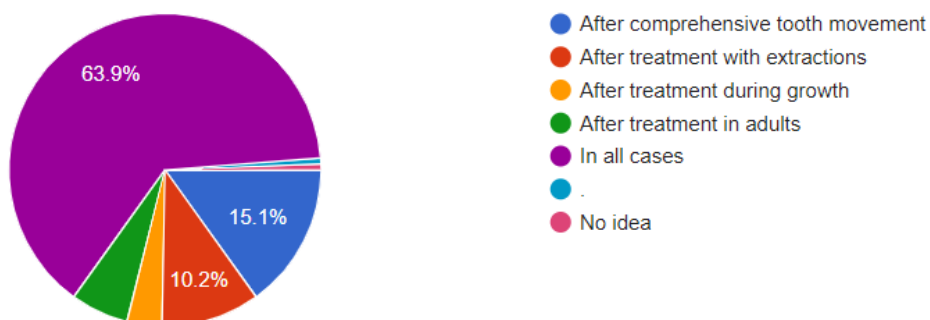
The average age of the 166 participants was between 20 to 22 years. The majority were female (70.5 per cent).



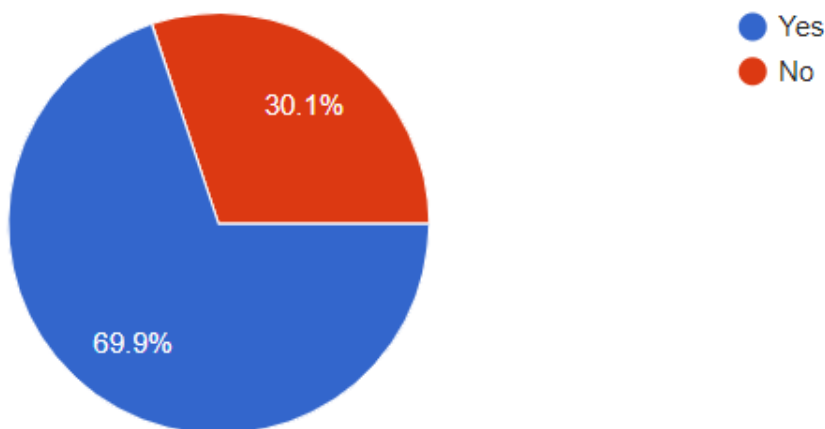
The participants’ level of knowledge on post-orthodontic retention is given. Majority of the participants (88.6 per cent) were aware that retention appliances are used after orthodontic treatment.

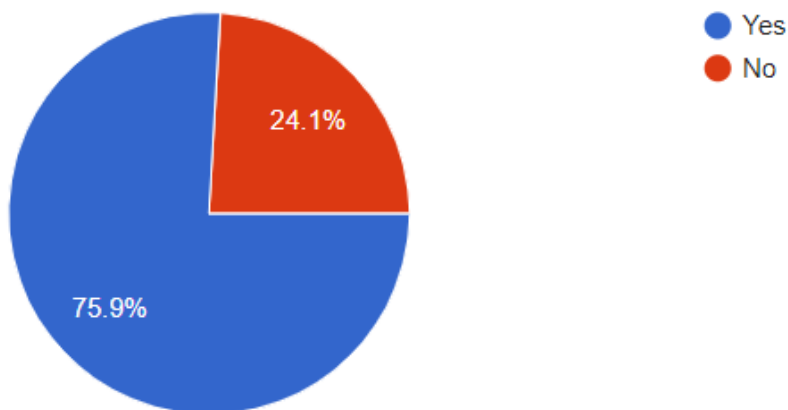


About 63.9 per cent participants thought that retention was necessary in all and not in specific cases only.

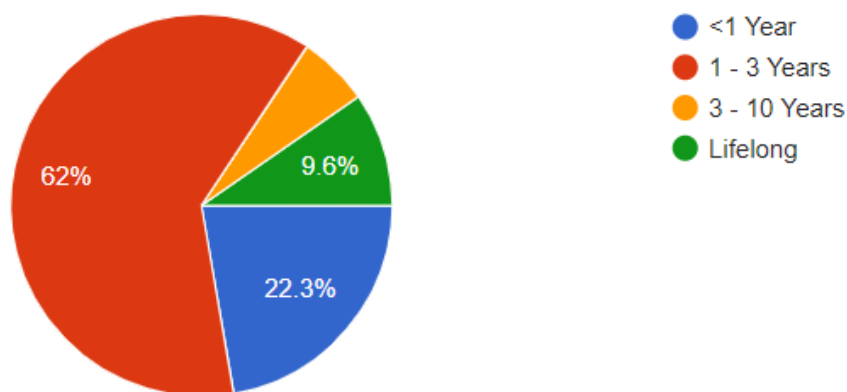


Finally, the majority believed both that a perfect orthodontic result can guarantee the results' stability (69.9 per cent) and that teeth can also move on their own without any orthodontic appliances (75.9per cent).

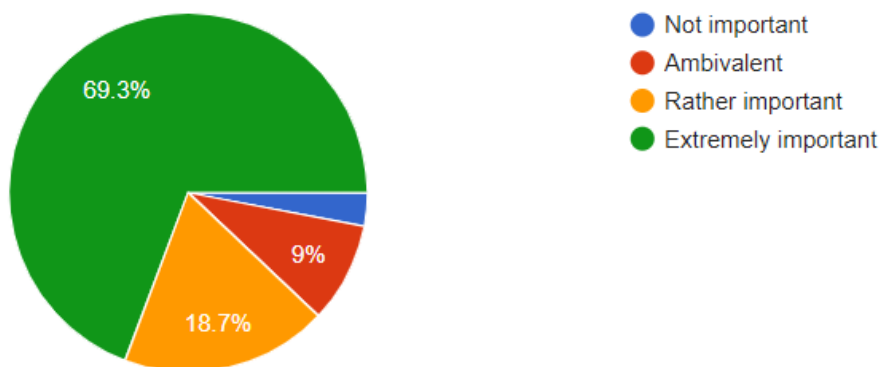




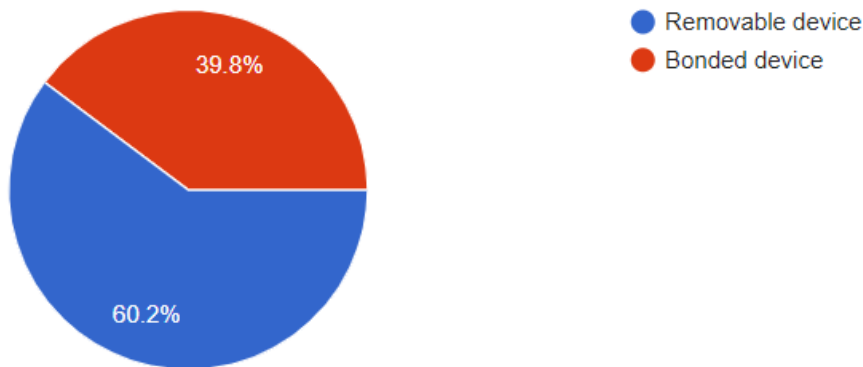
As far as expectations of the participants toward orthodontic retention are concerned, only 22.3 per cent thought that the retention phase should be less than 1 year,



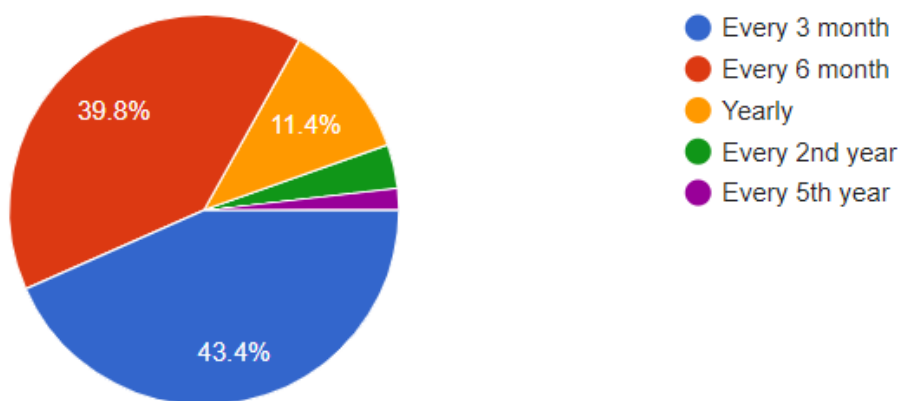
62 per cent thought that it should last between 1 and 3 years, and the remaining 15.7 per cent believed it should extend more than 3–10 years or lifelong. The vast majority of participants (88 per cent) rated the stability of the orthodontic results as ‘rather important’ or ‘extremely important’,



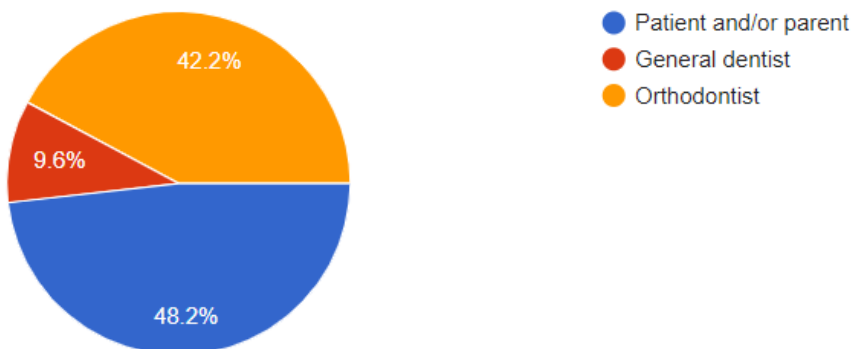
Where as most of them (60.2 per cent) preferred aremovable retention appliance over a bonded retainer.



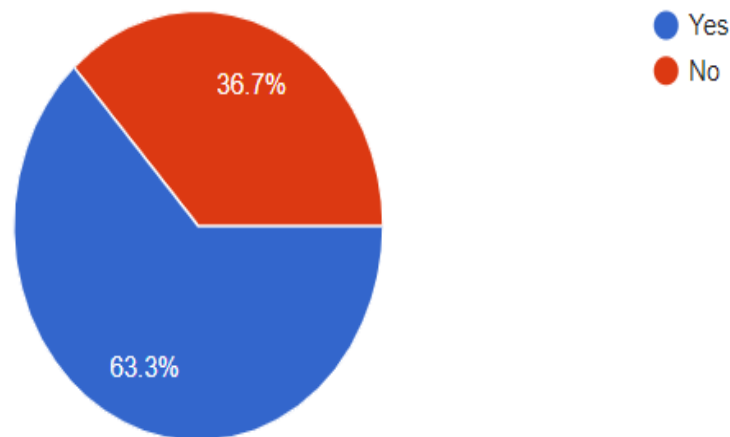
Most participants considered recalls were needed at 3–6 months’ intervals (83.2 per cent) or once a year (11.4 per cent).



The majority considered that the person most responsible for post-orthodontic stability was themselves, followed by orthodontists, and finally the general dentist (with percentages being 48.2 per cent, 42.2 per cent, and 9.6 per cent, respectively—with overlap).



Finally, the vast majority of the participants agreed that it is appropriate to charge fees for recall visits needed during orthodontic retention (63.3 per cent).



Responses to the questionnaire were considerably affected by the participants level of knowledge. The odds of believing that a perfect orthodontic result can guarantee stability were lower for participants with middle or higher education. In addition, the odds of believing that teeth can also move on their own without any orthodontic appliances were higher in younger participants, participants with middle or higher education. Finally, the odds of agreeing to be charged for retention recall visits were higher in female participants and those with middle or higher education.

IV. DISCUSSION

This study seems to be the first attempt to empirically address individuals before any orthodontic appointment in order to assess the level of knowledge and the expectations of people deciding about a prospective orthodontic treatment regarding post-orthodontic retention. We considered it to be of high interest to target people who are in charge of deciding about an impending orthodontic treatment involving a prolonged retention protocol, and to identify what they know and what they expect precisely at the time of their consent to the forthcoming treatment.

Although the number of participants and the return rate in this investigation can be considered sufficient to allow statistical tests beyond simple descriptive statistics, it was decided to refrain from a hypothesis-driven approach and remain entirely observational.

V. LEVEL OF KNOWLEDGE

One of the most striking findings of this study was that more than half of prospective patients (88.6 per cent) were aware that retention appliances are used after orthodontic treatment. Given the fact that almost all orthodontic patients are subject to some kind of retention protocol⁽⁶⁾, and considering the finding that post-treatment stability is viewed as important or extremely important (88per cent), this survey discloses an obvious divergence between the participants' anticipations and clinical reality.

A second major observation is another dissonance in the participants' understanding of tooth movement and stability. Although the majority of the participants (75.9 per cent) rightfully acknowledged that teeth can move without

any orthodontic force, most also believed that a perfect result can guarantee stability per se and 63.9 per cent assumed that retention appliances are needed in all cases. The trained orthodontist appreciates that continuous tooth migration throughout adolescent and even adult life affects both occlusion and alignment⁽²⁴⁻²⁷⁾ and may therefore ultimately compromise the stability of the achieved orthodontic results^(3, 28, 29). This study bears proof that this understanding is also shared by those participants with a higher level of education. Yet, for the majority of the population, non-orthodontic tooth movement is apparently not intuitive. Thus, this knowledge has to be transmitted, at the very latest before retention appliances are discontinued.

Recent surveys identified that orthodontists, at least in Switzerland, tend toward a ubiquitous approach in their retention protocol, retaining all post-orthodontic patients^(13, 15). This present investigation demonstrates that people deciding on a future orthodontic treatment are persuaded that only a minority of patients are in need of retention devices. On the basis of this observation, an obvious need of patient education becomes apparent.

VI. EXPECTATIONS

Patients' overall satisfaction with their orthodontic experience is intricately linked to their expectation of stability⁽²²⁾. A deeper understanding of particular expectations may, therefore, help avoid future dissatisfaction.

Overall, this study revealed that although the majority of the participants considered a stable result very important, an evident diversity in opinions and expectations exists concerning retention duration, recall intervals, or preferred devices. As far as expectations and preferences regarding orthodontic 'retention time' are concerned, only one-tenth of prospective orthodontic patients expected lifelong retention, and the majority anticipated a retention phase of somewhere between 1 and 10 years. No evidence-basis exists on the optimal duration of retention, and the extent of the retention period is mostly up to the discretion of the orthodontist^(13, 17). Screening the contemporary literature, a trend toward lifelong retention can be observed. This development has, however, major implications for patients apropos the number of recall visits and the demands made on their level

of compliance. On the basis of the findings of this present survey that most people deciding on an imminent orthodontic treatment do not expect lifelong retention to be de rigueur, patients should be informed of the risk that some relapse will occur after removal of retention appliances and of the physiological adaptations that take place over time⁽²²⁾. The lack of evidence and the absence of binding protocols on retention duration or recall intervals^(8, 10, 13, 15, 17) accentuates the point that orthodontists must not adopt a paternalistic approach on that matter, but rather seek to involve the patient in the decision-making process vis-à-vis termination or prolongation of the retention phase.

Lifelong retention will not only increase demands on the contributory role of patients but results in an intensified involvement of general dentists^(13, 14). This study reveals that only 9.6 per cent participants consider general practitioners to have any responsibility in the maintenance of retention devices. Prolonged retention should, however, be based on an involvement or at least a well-functioning communication and collaboration with general dentists^(13, 15).

On a positive note, this survey indicates that while for nearly all participants (88 per cent) a stable result was 'rather important' or 'extremely important', most were also ready to assume a certain degree of financial commitment and personal responsibility to guarantee a stable outcome. The majority (62 per cent) were ready to accept a retention phase of at least 1 year, most, in fact, expecting the duration to last much longer. Nearly all participants found recall intervals of 3–12 months acceptable, and 63.3 per cent were prepared to pay for these recall visits. Although only 48.2 per cent explicitly specified in their answers that they viewed the patient to be responsible for the stability after orthodontic treatment, the overall results bear witness that participants are willing to accept a certain degree of commitment. Although prospective patients or their guardians place the onus to guarantee a stable result on the orthodontists, they also realize that maintenance is necessary and can only be achieved with compliance. These observations indicate that the orthodontist is likely to find willing partners in post-orthodontic patients to contribute toward a successful retention phase. Somewhat surprisingly, females and participants with higher educational background were more likely to be willing to pay for recall visits. These findings are difficult to interpret but are in line with a previous investigation indicating that people with higher education are more likely to be willing to pay more for healthcare services⁽³⁰⁾ and are in agreement with past observations that women tend to behave more generously⁽³¹⁾ and more pro-socially than men in pecuniary matters⁽³²⁾

This study assesses decision makers of their knowledge and expectations 'before' they have had any orthodontic input. It would be of interest to consider differences found between this study and other studies directed to patients 'already in retention' that may indicate whether patients or their decision makers actually change their expectations having received further information.

VII. LIMITATIONS

This study seems to be the first attempt to describe the level of knowledge and the expectations of prospective orthodontic patients or their parents/those with legal decision-making responsibility, regarding post-orthodontic retention before any orthodontic appointment, is evidently not free of drawbacks. First, this study reports the results of a single-centred survey in a university setting of a specific country. Thus, the observations are not necessarily generalizable across different countries and clinical settings. Some participants might have been informed before their first orthodontic appointment about the need of orthodontic retention appliances by friends, family members, or other information sources and their knowledge in dental subjects, which might have influenced their answers in this survey.

Finally, some methodological shortcomings have to be addressed: open-ended questions could have yielded answers containing more information but would have been more difficult to interpret statistically. Although the limited amount of questions unquestionably was helpful to achieve a high return rate, it also restricted the potential of this survey.

On the basis of all these limitations, this piece of research should, therefore, be seen merely as an initial contribution to address the perspective of prospective patients regarding orthodontic retention. Mindful of all shortcomings, this study nevertheless identifies the necessity to further investigate pertinent issues related to pre-treatment expectations toward orthodontic retention and highlights certain aspects that thitherto remained unnoticed.

VIII. CONCLUSIONS

This questionnaire-based survey reveals that guaranteeing the result of orthodontic treatment is of great importance to people deciding about a prospective orthodontic treatment. Knowledge regarding possible post-orthodontic relapse and the need for post-orthodontic retention varies and seems to be influenced by the level of education. A certain consensus amongst Indian prospective orthodontic patients/decision makers seems to exist regarding responsibility, necessity of recalls, the takeover of costs, and preferences in retainer devices. On the basis of the results of this survey, it appears mandatory to adequately inform prospective orthodontic patients and their parents/guardians about the need of post-orthodontic retention, and the extent of future commitment expected from them during the retention phase.

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