

## Patients' perspectives of the long-term impact of orthodontic treatment: a qualitative study

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### ABSTRACT

**Objectives:** To explore how orthodontic treatment affects different aspects of life, such as self-esteem, well-being, and social interactions and, additionally, to identify the long-term challenges that orthodontic patients experience after treatment.

**Materials and Methods:** This qualitative study involved in-depth semistructured face-to-face interviews. A purposive sampling strategy aimed to recruit a representative cohort of orthodontic patients who had their orthodontic treatment in adolescence and had their treatment concluded at least 5 years previously. Twenty-one patients (13 females and 8 males) were interviewed using a prepiloted topic guide. These interviews were transcribed and analyzed verbatim, using the general inductive method of data analysis.

**Results:** The thematic analysis revealed four key themes and related subthemes: (1) self-confidence and interpersonal communication, (2) social and professional opportunities, (3) oral health and function, and (4) challenges. In-depth analysis revealed positive treatment outcomes regarding enhanced self-confidence, social interactions, and perceived improvement in oral health and function. It also highlighted ongoing challenges with retainers and dissatisfaction with relapse.

**Conclusions:** Orthodontic treatment can significantly impact patient lives. Orthodontic patients described direct long-term positive effects on their social lives and well-being. However, it is equally important to remain mindful of the long-term challenges that may arise after treatment, especially with retainer choices and relapse, enabling proactive measures to mitigate their impact. (*Angle Orthod.* 2025;95:205–211.)

**KEY WORDS:** Long-term challenges; Oral health-related quality of life; Orthodontic treatment; Retention; Self-esteem

### INTRODUCTION

Traditionally, the success of orthodontic treatment has been assessed by improvements in esthetics, occlusion,

function, and minimal posttreatment changes.<sup>1,2</sup> Although these aspects remain decisive, the modern understanding of successful treatment is geared toward a more holistic perspective, embracing the concept of patient-centered outcomes.<sup>3</sup> This shift recognizes that the accurate measure of success lies in the impact orthodontic treatment has on a patient's well-being and quality of life, encompassing psychosocial factors such as self-esteem, dental self-confidence, and social impact.<sup>4,5</sup>

Researchers have focused on short-term clinical outcomes, such as treatment efficacy and short-term posttreatment stability.<sup>6,7</sup> While these aspects are undoubtedly crucial for evaluating the immediate success of orthodontic treatment, they only provide an incomplete perspective, overlooking the broader impact orthodontics may have on patient quality of life. Studies in which authors explored self-esteem, body image, and social impact following treatment are limited. However, authors of qualitative research have shed some light on the role social media plays in shaping societal

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perceptions of dentofacial features.<sup>8</sup> It is worth noting that dentofacial esthetics often remain the primary motivator for patients seeking orthodontic treatment; this is often intertwined with complex social and individual factors.<sup>9,10</sup>

Understanding the long-term perspectives of orthodontic patients holds tangible clinical significance. A patient-centered approach can guide communication, enhance informed consent, and ultimately personalize treatment plans to address individual needs beyond tooth alignment.<sup>11</sup> To date, the understanding of the long-term effects of orthodontic treatment remains surprisingly limited. A recent meta-synthesis<sup>12</sup> highlighted that long-term orthodontic research remains largely uncharted territory, leaving a significant gap regarding the enduring impact of orthodontic treatment on patients' lives and a pressing need for further exploration. Given the inherently subjective and multifaceted nature of treatment experiences, a quantitative approach would be inadequate. Thus, in this qualitative report, we aimed to explore the long-term impact of orthodontic treatment on various aspects of life, including patient self-esteem, social interactions, oral health, and overall well-being, as revealed through patient perspectives.

## MATERIALS AND METHODS

In this qualitative study, we followed the consolidated criteria for reporting qualitative research checklist.<sup>13</sup> Before study commencement, approval was obtained from the Ethics Committee, University of Otago, New Zealand (H19-160).

In this study, we used a purposive sampling technique. Participants were recruited through flyers, mailing lists, and word of mouth, ensuring they reflected the typical orthodontic treatment commonly received during adolescence in private orthodontic settings. The inclusion criteria were (a) adult individuals of any gender who had their orthodontic treatment during adolescence (13–18 years), who (b) finished orthodontic treatment at least 5 years ago and (c) could communicate in English. In addition, no recruitment restrictions were placed based on whether the participants had successful orthodontic treatment or specific negative experiences, as these aspects were left to emerge during the interview process. Participants with craniofacial syndromes and/or orthognathic surgery patients were not considered for inclusion in this study.

In-depth face-to-face interviews were individually conducted by an orthodontist (HM) with prior training in qualitative methods, in a secure nonclinical facility at the University of Otago. The interviewer introduced himself as a researcher interested in exploring the long-term perception of orthodontic treatment. The semi-structured interview had a topic guide and a framework of critical questions. However, the semistructural nature

of the interviews was inviting to both the interviewer and participants to follow emerging ideas that surfaced during the discussion. Interviews were recorded digitally and then transcribed verbatim. The topic guide was updated until conceptual saturation was reached, with each interview starting with introductions and research objectives. The guide then discussed past clinical experiences and their posttreatment impact on various aspects of life and day-to-day activities. The interview was concluded with long-term challenges, concerns, and future recommendations (Figure 1).

All participants signed informed consent and were informed of their right to withdraw from the interview at any time. They were given a study summary and were informed that they would be audio-recorded during the interview. The study data, including personally identifiable information, were stored securely, password protected, and accessible only to the research team. All participants received a \$20 voucher as reimbursement for their participation in this study.

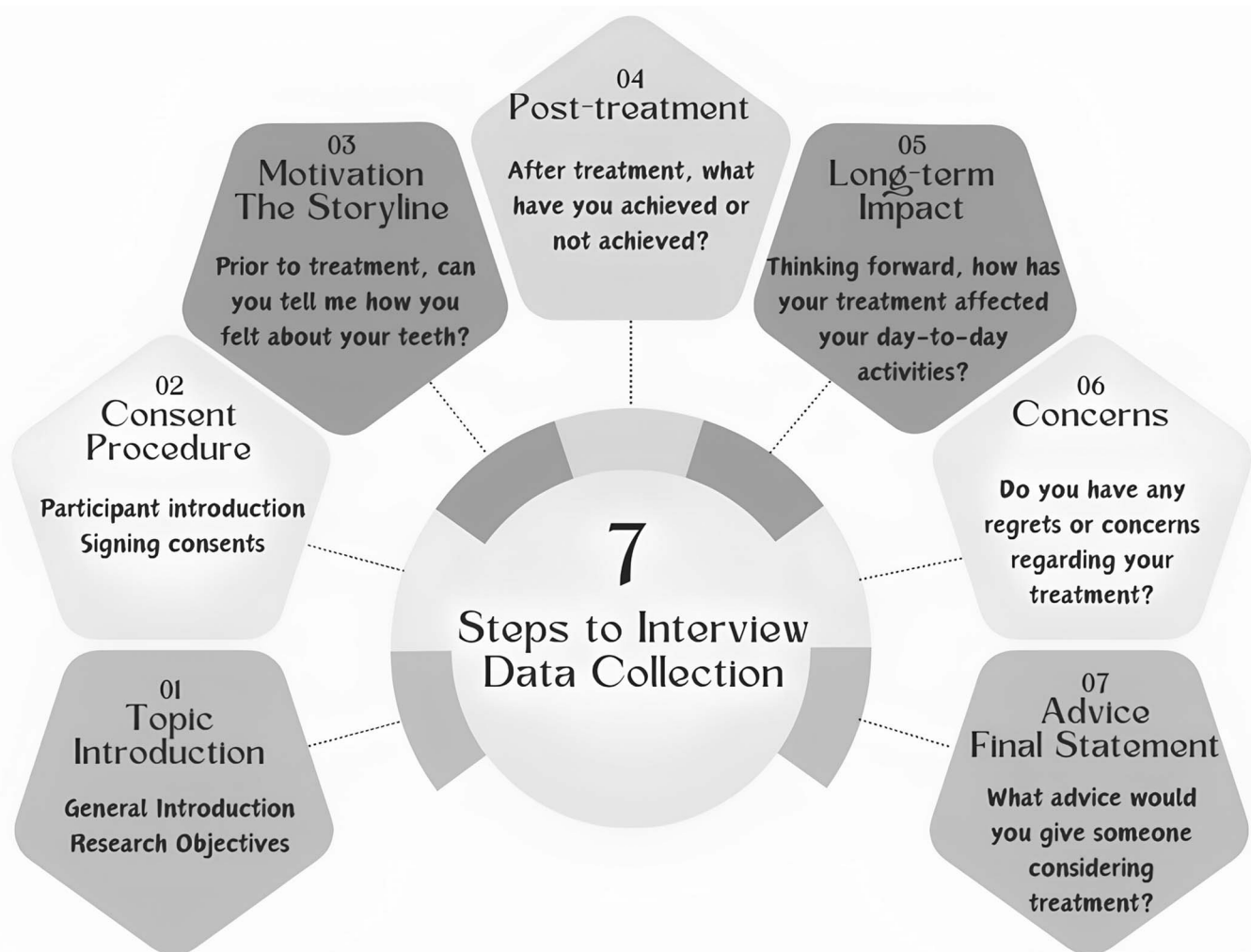
## Data Analysis

The research team undertook a multipronged approach to explore the diverse range of participant experiences. First, immersion through repeated reading and memoing facilitated a thorough understanding of the qualitative data collected, including frequently occurring terms. Team members analyzed data using an Excel spreadsheet (Microsoft, Redmond, Washington) for initial coding and theme identification. Several key initial themes were identified from the interviews using the general inductive qualitative data analysis method. The method aims to (1) condense a wide array of qualitative data into key themes and a summary, (2) establish transparent relationships between the research aims and the findings distilled from the raw data, and (3) develop a theory or model that uncovers the inherent structures of experiences or processes indicated by the raw data.<sup>14</sup>

Regular team meetings served as a crucible for collective reflection, where initial codes were refined, discrepancies reconciled, and thematic frameworks began to emerge. This iterative process of individual coding, collaborative discussion, and shared refinement ensured rigor and coherence in the thematic analysis, ultimately shaping the findings.

## RESULTS

Twenty-six individuals were assessed for eligibility, of whom five did not meet the study criteria. Three did not meet the 5-year follow-up requirement, one was unable to communicate effectively in English, and another received interceptive treatment during the mixed dentition phase. Overall, 21 adult participants (8 males and 13 females) were interviewed. All participants



**Figure 1.** Data collection with representative interview questions.

received fixed appliance treatment, and the majority completed their treatment in private practice settings. Participant demographics are described (Table 1). Four main themes and their associated subthemes were identified (Table 2).

### **Theme 1: Self-Confidence and Interpersonal Communication**

*Self-perception.* Improved self-perception can positively impact many aspects of life, from social relationships to professional opportunities. Interviewed participants described an increase in confidence and attractiveness, enabling them to engage in social interactions more easily.

“I can’t think of how to put this the right way but like in a greater perception of myself, so I’m more comfortable with how I look now” (P5, F, time since debond: 5 years).

*Increased tendency to smile.* Most participants reported their openness to smile at other people and being comfortable interacting with others after orthodontic treatment. They attributed their improved social comfort to several factors, including no longer feeling self-conscious about their teeth and having confidence in their appearance.

“I smiled normally amongst people, but like for photos, I would always just do the no teeth smiles, so it was nice to properly smile for all the photos. It probably just added to my confidence, so I think I feel more confident now” (P14, F, time since debond: 12 years).

*Social acceptance.* Numerous long-term orthodontic patients described an enhanced sense of attractiveness and social acceptance in their daily lives following fixed appliance treatment. These perceived benefits were closely linked to the increased self-esteem and confidence since their treatment completion.

**Table 1.** Descriptive Characteristics and Demographics<sup>a</sup>

Demographic Data	Values
Participants' age and interview length	
Age, mean $\pm$ SD, y	25.5 $\pm$ 8.7
Interview length, mean $\pm$ SD, min	24.6 $\pm$ 4.5
Gender	
Male	8
Female	13
Ethnicity	
Caucasian European	19
Other	2
Time since debond, (10.0 $\pm$ 9.0 y)	
$\geq 5$ y	14
$\geq 10$ y	7
Main motive for seeking treatment	
Teeth were not straight	12
Overbite or underbite issues	4
Recommendation (eg, parent-driven)	3
Other reasons	2
Treatment setting	
Private setting	20
University setting	1

<sup>a</sup> This table presents the characteristics and demographics of participants: (a) the average age was 25.5  $\pm$  8.7 y, indicating a moderately varied age range among the participants at the time of interviews; (b) the interviews lasted 24.6  $\pm$  4.5 min, suggesting relatively consistent interview lengths; (c) the gender distribution of participants was skewed toward females, with 13 female and 8 male participants; (d) regarding ethnicity, the majority were Caucasian European (19 participants), with only two identifying as other ethnicities; (e) the time elapsed since debond revealed that 14 had their treatment completed at least 5 years ago, and seven had treatments dating back 10 years or more, indicating a focus on longer-term posttreatment experiences; (f) the primary motive for seeking orthodontic treatment varied: 12 participants cited having non-straight teeth, four had overbite or underbite issues, three sought treatment due to recommendations (such as from parents), and two had other reasons; (g) the majority of treatments were conducted in private settings reflecting common orthodontic practice, with only one participant receiving treatment in a university setting. These data help contextualize participants' varied perceptions of the long-term effects of orthodontic treatment.

"It could be quite important to have straight teeth because I think there's some sort of social recognition that people with straight teeth are more respectable. I think it is something people value in society" (p19, F, time since debond: 6 years).

## Theme 2: Social and Professional Opportunities

**Participation in social events.** Social activities open doors to new opportunities, enriching experiences, and potentially lasting friendships. Many patients expressed an increased inclination to engage in social and cultural events after orthodontic treatment, attributing this to the newfound confidence gained from their beautiful smiles.

"I got confidence, like in taking photos at the school ball, and for someone that doesn't want to go to those

events, that was an achievement for me. I wouldn't have done that prior to getting braces!" (P1, M, time since debond: 7 years).

**Ability to form relationships and make new friends.** Numerous participants perceived having straight teeth and a beautiful smile, achieved through orthodontic treatment, as a catalyst for personal growth. They attributed improved self-confidence and perceived attractiveness to increased success in forming new friendships and potentially finding their dream partner.

"With relationships, there might be people who would not be as interested in getting to know you if you did not have nice teeth" (P9, M, time since debond: 11 years).

**Workplace and professional prospects.** Many participants emphasized how a confident smile acquired after orthodontic treatment significantly impacted their professional lives. They described enhanced confidence during job interviews, leading to successful professional achievements.

"If I didn't get braces when I was younger, I'd definitely be getting them now. I think employers often like that. I know a lot of people that [think], I need to have good teeth... like news reporters, actors, and broadcasters; they all need a pretty smile" (P11, M, time since debond: 6 years).

## Theme 3: Oral Health and Function

**Improved masticatory function and oral hygiene.** Several participants reported a significant improvement in their oral hygiene and chewing ability following orthodontic treatment. They attributed this to the easier cleaning and oral hygiene maintenance afforded by their straightened teeth. This ease translated into improved function, allowing them to chew various food types effectively.

"It is comfortable to chew now on both sides when perhaps, before my braces, I think I was very right-sided chewing dominant. Now it's kind of both; teeth feel like they meet a bit better" (P15, M, time since debond: 11 years).

**Reduced risk of dental problems.** Several participants perceived the long-term benefits of orthodontic treatment in reducing the risk of developing caries and periodontal disease. They viewed their straight teeth as esthetically pleasing and functionally advantageous, facilitating easier cleaning and flossing, thus reducing their susceptibility to dental problems. Despite the substantial cost, some participants considered orthodontic treatment a beneficial financial investment due to its potential to prevent costly future dental interventions.



**Table 2.** Conceptualization of the Main Themes and Subthemes

Main Theme(s)	Definition	Conceptualization	Subtheme(s)	Key Quotation
Self-confidence and interpersonal communication	This theme explores the relationship between orthodontic treatment and developing confidence and effective communication	Transformations in self-perception and outward expression leading to improved social interactions and personal growth	(1) Self-perception (2) Increased tendency to smile (3) Social acceptance	"I smiled normally amongst people, but like for photos, I would always just do the no teeth smiles, so it was nice to properly smile for all the photos. It probably just added to my confidence, so I think I feel more confident now" (P14, F, time since debond: 12 y)
Social and professional opportunities	Orthodontic treatment and its impact on social skills and career advancement	Enhanced perceived attractiveness opening doors to broader social and career prospects	(1) Participation in social events (2) Ability to form relationships and make new friends (3) Workplace and professional prospects	"If I didn't get braces when I was younger, I'd definitely be getting them now. I think employers often like that. I know a lot of people that [think], I need to have good teeth... like news reporters, actors, and broadcasters; they all need a pretty smile" (P11, M, time since debond: 6 y)
Oral health and function	Impact of orthodontic treatment on oral hygiene practices and oral function	Positive perceived long-term influence on oral health and function	(1) Improved masticatory function and oral hygiene (2) Reduced risk of dental problems (3) Overall health and well-being	"It is comfortable to chew now on both sides when perhaps, before my braces, I think I was very right-sided chewing dominant. Now it's kind of both teeth feel like they meet a bit better" (P15, M, time since debond: 11 y)
Challenges	Potential issues and concerns that orthodontic patients experience in the long term	Ongoing need for retainer wear and dissatisfaction with relapse	(1) The long-term burden of wearing removable retainers (2) Flossing hygiene with fixed retainers (3) Dissatisfaction	"They've definitely moved quite a lot since then. I guess that would've been 20-something years ago, and I had a bar on the inside of my bottom teeth which I only actually got taken off not all that many years ago. It was a really good result, but they definitely had moved a wee bit" (P21, F, time since debond: 27 y)

"In the future, I guess the chances of me needing further treatments are less. It's important to have straight teeth or at least healthy teeth" (P13, M, time since debond: 11 years).

*Overall health and well-being.* Many participants perceived long-term health gains from completing orthodontic treatment. They linked improvements in oral health with positive impacts on their physical well-being, emotional health, and mental outlook.

"If I hadn't had braces, I could very well be quite self-conscious on a day-to-day basis about my teeth and my face, which would be a real shame. It just helps with, I'd say, almost your overall happiness and well-being, even sort of mental well-being" (P9, M, time since debond: 11 years).

**Theme 4: Challenges**

*The long-term burden of wearing removable retainers.* The constant burden of wearing removable retainers emerged as a significant challenge for some

participants. They described the inconvenience, time commitment, and speech issues associated with wearing retainers for several hours daily, further compounded by difficulties in maintaining their oral hygiene practices.

"I didn't really like wearing it [the removable plate]. I know I had to, but I didn't like wearing that, especially the days where I had to wear them all the time, because you'd get a bit of a lisp and you'd start talking a bit weird" (P20, M, time since debond: 5 years).

*Flossing hygiene with fixed retainers.* Several participants had concerns regarding flossing difficulties with fixed retainers. While most considered this a minor inconvenience, some expressed uncertainty about its long-term impact on oral health.

"I would like the wires off to floss, but the dentist said, 'No, they're really important so leave them on, and it's their job,'" (P2, F, time since debond: 5 years).

*Dissatisfaction.* Dissatisfaction with treatment outcomes emerged in some interviews, notably not due

to immediate posttreatment esthetics but instead from long-term relapse experiences in some cases. Participants reported noticing teeth shifting after discontinuing removable retainers or having fixed retainers removed years later, leading to varying degrees of dissatisfaction.

"They've definitely moved quite a lot since then. I guess that would've been 20-something years ago, and I had a bar on the inside of my bottom teeth which I only actually got taken off not all that many years ago. It was a really good result, but they definitely had moved a wee bit" (P21, F, time since debond: 27 years).

## DISCUSSION

In this qualitative study, we explored the long-term impact of orthodontic treatment from the patient perspective, examining its influence on social interactions, professional lives, and oral health. To date, no qualitative researchers have investigated this multifaceted impact with such depth in the long term. In summary, the analysis revealed four main themes and their associated subthemes: (a) self-confidence and interpersonal communication, (b) social and professional opportunities, (c) oral health and function, and (d) challenges.

The findings highlighted a strong link between orthodontic treatment and improved self-perception, leading to increased social acceptance. Participants consistently reported increased confidence and willingness to smile openly, attributing these changes to their perceived attractiveness and improved dental esthetics. This observation aligns with existing research suggesting a positive impact of orthodontic treatment on posttreatment self-esteem and social interactions.<sup>15</sup> However, in this study, we pushed these findings further by demonstrating the longevity of these effects. Even years after treatment, participants reported sustained social engagement and confidence benefits. This suggests that the positive impact of orthodontic treatment on self-perception and interpersonal communication may endure, offering individuals a potentially transformative change in their social lives.

We also revealed how orthodontic treatment can open doors to new social and professional opportunities. Participants reported increased participation in social events, enhanced ability to form relationships and improved workplace prospects. These findings echo existing research, suggesting that orthodontic treatment can lead to greater social acceptance<sup>16</sup> and even influence career choices toward dentistry.<sup>17</sup> In the social media age, the constant exposure to curated online images and the emphasis on idealized facial esthetics can influence patient motivations to seek orthodontic treatment for a more desirable dento-facial appearance.<sup>18</sup> Notably, the participants in this study acknowledged that, while having straight teeth

could be beneficial in specific jobs requiring public interaction, it was not a universal requirement for professional success.

In this study, we highlighted the perceived benefits of orthodontic treatment in terms of reducing the risk of developing dental problems. However, it is crucial to acknowledge that, in the literature, reporting on the link between malocclusion and specific dental risks like caries and periodontal disease remains inconclusive.<sup>19</sup> Ultimately, the emotional and mental boost from the improved esthetics after orthodontic treatment may amplify these positive experiences, potentially leading participants to associate them with broader gains.

The constant burden of removable retainers emerged as a significant obstacle, with participants describing discomfort, time commitment, and speech impediments that potentially lead to noncompliance; this was consistent with findings from previous researchers on factors influencing compliance with retainer wear.<sup>20</sup> Conversely, difficulties with fixed retainer flossing were often perceived as minor inconveniences. Perhaps most concerning was the presence of posttreatment dissatisfaction, mainly due to relapse after treatment completion. Though relapse is inherently unpredictable, clear communication with patients beforehand regarding retainer choices and postorthodontic expectations is crucial.

Researchers should prioritize tackling challenges related to retainer choices and relapse, as these persistent issues can undermine the overall treatment experience. Future researchers in orthodontics should focus on developing user-friendly and effective retainer designs to enhance patient compliance and comfort. This includes the exploration of new materials and technology to improve retainer durability and ease of use. Longitudinal studies are suggested to better understand the underlying causes of orthodontic relapse and to develop effective prevention strategies. Additionally, it can be recommended to further investigate the psychological impacts of orthodontic treatment on self-esteem, social anxiety, and overall life satisfaction.

Although, in this study, we offered valuable insights, some limitations exist. First, all participants received treatment with fixed appliances and adjuncts. Therefore, the perceptions and perspectives of individuals treated with other appliances, such as clear aligners, may differ, and the findings may not directly apply to them. Second, focusing on adolescents in private orthodontic settings in New Zealand, while reflecting typical orthodontic treatment delivery, limits generalizability to other demographics and regions. Differences in treatment costs, consent procedures, and appliances used across the globe could significantly impact patient experiences. Last, the severity of pretreatment malocclusion might be influential in how patients perceive their orthodontic outcomes posttreatment. However,

assessing malocclusion severity through pretreatment models was challenging due to the diverse private practice demographics of participants, some of whom had received treatment decades ago. Authors of future qualitative studies should explore the perception of orthodontic treatment in diverse settings and with various appliances, including clear aligners.

## CONCLUSIONS

- The findings of this study highlight the long-term positive impact of orthodontic treatment on patients' lives.
- Participants reported significant improvements in social interactions, career opportunities, and oral function beyond esthetic enhancements.
- Despite these positive outcomes, challenges with retainers and relapse persist over the long term, demanding ongoing support and proactive strategies to preserve the enduring benefits of orthodontic treatment.

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## DISCLOSURE

All authors declared that they have no competing interest.

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