



# Cultural awareness scale: Psychometric properties of the Turkish version



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## ABSTRACT

**Background:** Cultural competence, a relatively new concept in the world of healthcare professionals, has garnered an increasing global attention over the last 20 years. An accurate assessment of baseline knowledge, skills, attitudes, strengths, and limitations of the students in delivering culturally congruent nursing care appears to be a key component in designing teaching strategies.

**Aim:** The current study aimed to analyze the psychometric properties of the Turkish language version of the Cultural Awareness Scale and to determine any possible similarities between the compositions of the Turkish version and the original scale.

**Methods:** This methodological study included a sample size of 197 undergraduate nursing students. The research data were collected using a sociodemographic form and the Turkish language version of the Cultural Awareness Scale, which contains 36 items designed to address five different factors using a 7-point Likert response format.

**Findings:** The Turkish language version of the scale comprised 36 items under four different subscales. The scale was found highly reliable, with an internal consistency estimate of reliability at 0.897 for the total scale, which ranged from 0.751 to 0.868 for the subscales. The item-total correlation test showed that there was a significant correlation between each item and the remaining items, with correlation coefficient values ranging from 0.147 to 0.647.

**Conclusions:** The results of the analyses showed that the Turkish language version of the Cultural Awareness Scale was a highly valid and reliable instrument; therefore, it might prove a valuable asset for use in various healthcare disciplines.

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## 1. Introduction

The recent movements of human populations around the world occurs at such an unprecedented scale that it poses significant challenges in delivering medical and nursing care to people with completely different healthcare beliefs, views and practices. On the other hand, worldwide nurse migration, mainly taking place to make up for a nursing staff shortage in certain countries, puts the nurses in a similar situation where they need to provide nursing care for patients with diverse cultural backgrounds (Douglas et al., 2014).

Over the last 20 years, cultural competence has gained widespread recognition in the evolving scene of healthcare (Salman et al., 2007). Some have described cultural competence as a multi-

dimensional process that requires ongoing active learning (Calvillo et al., 2009; Unkuri et al., 2014). Although variety of descriptions are available in the literature, cultural competence in healthcare is usually known as possession of cultural knowledge, attitudes, understanding and a set of practice skills that ensures delivery of high quality healthcare services to patients from diverse backgrounds; or more concisely, ability to provide a culturally appropriate care (Loftin, Hartin, Branson, & Reyes, 2013). In order to deliver a safe, effective and quality care, all nurses should be aware of and sensitive to diverse individual beliefs related to health and illness, religious influences, native languages, values, along with other cultural and socioeconomic factors that may play a role in the health of patients (Calvillo et al., 2009). Besides, there is also another concept that needs to be paid attention to by the nurse, which is cultural safety. The notion of cultural safety primarily focuses on the nurse's differences, rather than patient's existing differences (Ramsden, 2002). It calls attention to the fact that patients might have certain expectations from the nurses providing healthcare.

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As the world is becoming a smaller place every day, cultural competence and cultural awareness have emerged as vital practice skills in the nursing profession (Bohman & Borglin, 2014). Considering the massive scale of globalization, immigration, rapid evolution into culturally diverse populations, as well as developing health-care concepts, there appears a critical need for curricula in nursing schools that effectively incorporate culturally competent care into training process (Cuellar, Brennan, Vito, & Siantz, 2008). However, there is no evidence-based training method to explain the best way to produce culturally competent nurses with cross-cultural skills (Carter et al., 2006; Cuellar et al., 2008). Thus, the duty to raise cultural awareness and sensitivity among nursing students to ensure the entry of culturally competent practitioners into workforce lies with the nursing instructors and faculty members (Sanner et al., 2010). Given the circumstances, the major challenge for the nursing instructors is therefore preparing students equipped with skills that would allow the delivery of quality healthcare to individuals with diverse cultural backgrounds (Jeffreys, 2000). A wide range of instruction methods are currently utilized to teach various aspects of cross-cultural care in health-related professions. Studies investigating the outcomes of such education methods show that relevant training improves cultural awareness and sensitivity among learners, equipping them with adequate knowledge and practice skills (Carter et al., 2006). Moreover, with the right education, cultural competence may be achieved not only at individual level, but also at communal, organizational and societal levels. Assessment of individual cultural competence needs to be conducted within the context of organizational skills or at a systemic level, including cultural competence of the faculty, which can have a significant impact on student performance (Calvillo et al., 2009).

It is the responsibility of nursing schools and faculties to produce culturally aware graduates who are sensitive in cross-cultural interactions (Rew, Becker, Cookston, Khosropour, & Martinez, 2003). Today, for every individual in the sector, from employers to educators, cultural competence is considered a vital component of professional nursing practice. In the employment stage, all types of health organizations expect that nursing graduates be culturally competent professionals. For the reasons described above, what we need is a reliable psychometric instrument that can accurately measure the cultural awareness level of nursing students in Turkey.

The aim of this study was to analyze the psychometric properties of the adapted Turkish language version of the Cultural Awareness Scale (CAS).

## 2. Methods

### 2.1. Design and sample

This methodological study included a sample size of 197 undergraduate nursing students. The translated and culturally adapted of the scale began in 2011. The validation study of the Turkish language version of the CAS was carried out in 2012. The research data were collected through face-to-face interviews conducted at the nursing school. The data collection tools comprised a questionnaire designed to gather data on the demographic details of the participants, as well as the Turkish language version of the CAS.

### 2.2. Measures

Our literature review identified 11 psychometric instruments available for measuring cultural competence levels of nurses and nursing students (Loftin et al., 2013). After meticulous comparison of these instruments, the authors decided on the CAS, which was originally developed by Rew et al. (2003). The CAS is a 36-item scale containing 5 different subscales designed to

address five key domains of multidimensional nature of cultural awareness: general educational experience, cognitive awareness, research issues, behaviors/comfort with interactions, and patient care/clinical issues. These five key categories were identified as a result of an extensive literature search by Rew et al. on cultural awareness, cross-cultural sensitivity, cultural competence, nursing training and clinical practice, and then used as a design plan for creating a measurement tool to effectively assess cultural awareness levels of nursing students (Rew et al., 2003). Our main data collection tool, the CAS questionnaire asks respondents to rate each item on a 7-point Likert scale from 1 to 7 (1 = strongly disagree to 7 = strongly agree). The scale was found highly reliable with an internal consistency reliability score of 0.91 for students and 0.82 for faculty members. The Cronbach's alpha coefficients computed to assess each category were between 0.66 and 0.88 for the students, and 0.56 and 0.87 for faculty. The scale also includes reverse coded items which are negatively phrased (items: 8, 9, 12, 16, 19, 22, 36) (Rew et al., 2003). A confirmatory factor analysis (CFA), carried out to verify the factor structure, showed Cronbach's alpha scores ranging from 0.70 to 0.89 (Rew, Becker, Chontichachalauk, & Lee, 2014).

### 2.3. Language adaptation

Cross-cultural adaptation of survey instruments has been described as a challenging and time consuming process, though such efforts usually prove highly fruitful and rewarding (Weeks, Swerissen, & Belfrage, 2007). The main purpose in cross-cultural adaptation is to create a version of a survey instrument in a target language, which is conceptually and culturally equivalent to the original. On the other hand, the process of congruent cross-cultural translation aims to preserve uniformity with the source in terms of content, semantics, methodology, criteria, and concept (Flaherty et al., 1988). We complied with the common guidelines derived from these translation models during the translation and cultural adaptation of our version of the scale.

An independent back-translation technique was employed to ensure a most accurate translation of the original English language scale into the Turkish language. First, the source text was independently translated into Turkish by six nursing faculty members whose native language was Turkish. Then, the Turkish version was back-translated into English by two experts whose native language was English, and compared to the original version. All translators conducted their work independently and were not affiliated with the research in any other way. Once the forward and backward translation steps were successfully completed, a meticulous comparison was made between the original and back translations of both English and Turkish versions. Afterwards, a panel of seven experts were requested to review and assess each scale item for its content validity, linguistic properties, conceptual equivalence and comprehensiveness. Each expert was provided with a content validity index form to allow grading of each scale item. The content validity index used a 4-point Likert grading format (1 = not relevant, 4 = very relevant). We set a relatively high threshold of consensus for item retention, which required agreement by at least 80% of the panel. (Tavşancıl, 2002). Certain minor changes, in line with expert suggestions, were made in the wording of the items, and then the instrument was administered in 10 nursing students as a pilot testing, which finalized the adaptation process of the Turkish version of the CAS.

### 2.4. Statistical analysis

The Statistical Package for Social Sciences (SPSS, version 15.0) was used in the analysis of frequencies and descriptive nature of the demographic variables.

The content analysis was based on multiple expert views to ensure content validity (Aksakoğlu, 2001; Gözüm & Aksayan, 2003). The oblique rotation method was applied to the factor analysis results. The Kaiser-Meyer-Olkin (KMO) test was used to measure sampling adequacy, and the Bartlett's sphericity test was performed to analyze the correlation matrix (Aksakoğlu, 2001; Özdamar, 2002; Sümbüloğlu & Sümbüloğlu, 1998). We conducted a series of calculations to produce means, standard deviations and the range of the adapted scale, which were presented as descriptive characteristics. To determine the scale's reliability, we used internal consistency reliability estimation, where the Cronbach's alpha coefficient was calculated to assess the degree of internal consistency and homogeneity between the items. Besides, Pearson's correlation coefficient was calculated to measure the item-scale correlation (Aksakoğlu, 2001; Özdamar, 2002; Polit, 1996; Sümbüloğlu & Sümbüloğlu, 1998). Results yielding a  $p$  value below 0.05 ( $p < 0.05$ ) were considered statistically significant.

### 2.5. Ethical considerations

Prior to initiation of any research protocols, we obtained permission for use from Lynn Rew, the original developer of the CAS, via email correspondence, as well as a written approval by the competent scientific research ethics committee in Isparta.

## 3. Findings

The mean age of the study participants was  $20.76 \pm 1.62$  years. 70% of the students were female and they lived in nuclear families.

### 3.1. Validity analysis

The content validity and construct validity analyses were performed in order to estimate the validity of the adapted version of the CAS. To ensure content validity, the final Turkish language version of the instrument was presented to a panel of 7 subject matter experts. Minor revisions were made in the scale items in accordance with expert suggestions. To assess the extent of agreement among the experts, we used Kendall's Coefficient of Concordance, which indicated a significant compatibility ( $K = 0.923$ ,  $p < 0.005$ ).

The assessment for structure validity included an exploratory factor analysis protocol, which showed good sampling adequacy with a KMO value of 0.843 and a statistically significant Bartlett's sphericity ( $\chi^2 = 2676.007$ ,  $p < 0.001$ ).

The factor structure was assessed through principal component analysis (PCA), varimax rotation and eigenvalue for a given factor, and the analyses showed a total of 9 dimensions, which explained the 60.7% of the total variance. We performed the Scree test as a secondary approach to graphically determine the optimal number of factors to retain, and the resulting plot was interpreted as clear-cuts at four points (Fig. 1). In the analysis of factor loading, a measured variable should not load on more than one factor. The results of the factor analysis demonstrated that certain items loaded on multiple factors, in contrast to the original scale (Rew et al., 2003). The researchers therefore resolved the issue by placing such items into the most relevant factor groups, which constructed the final form structure of the Turkish version of the CAS (Table 1).

The final version of the revised scale contained 36 items and 4 factors explaining 42.642% of the total variance. The percentages of variance explained by each factor were 24, 8, 6, and 5, respectively. There were only six items (9,12,16,19,22,36) with a factor loading less than 0.25.

The factor 1 contained 13 items (27,26,18,25,30,23,28,31,21,13,14,24,10). It emerged as the strongest factor, explaining the highest percentage (23.870%) of total variance. Factor 2 included 7 items (15,11,6,20,5,7,17),

accounting for 7.997% of the total variance explained. Factor 3 contained 11 items (9,8,32,12,33,36,35,34,16,19,22). This factor group explained 6.118% of the total variance of the scale. Finally, factor 4 contained 5 items (2,3,4,1,29), adding very little (4.657%) to the explained variance of the CAS. (Tables 1 and 2).

### 3.2. Reliability analysis

In the total scale scores, the ratio of standard deviation was computed as 28.86, with a mean total score of 154.90. The mean of individual item scores was  $4.30 \pm 0.80$ , while the lowest mean score was  $3.18 \pm 1.86$  and the highest  $5.55 \pm 1.64$ .

Multivariate comparisons by Hotelling's T-squared distribution test showed significant differences, yielding a  $T^2$  value of 668.415 ( $p < 0.001$ ). The item-total correlation scores ranged from 0.147 to 0.647, where the item 21 had the highest score. The item-total correlation coefficients were found statistically significant ( $p < 0.001$ ). As for the estimation of reliability, the total scale showed a fair internal consistency, with a Cronbach's alpha coefficient of 0.897, while coefficient values for subscales ranged from 0.751 to 0.868 (Table 2).

Split-half reliability method was also used to assess the internal consistency of the total scale. The results showed that the first split half scored yielded an alpha coefficient of 0.766 and the other half 0.864. Guttman split-half coefficient was 0.835, while calculations with Spearman-Brown formula produced a reliability estimate of 0.846.

## 4. Discussion

As described in details below, a series of validity and reliability assessments were carried out to evaluate and estimate the psychometric properties of the adapted Turkish language version of the Cultural Awareness Scale.

### 4.1. Scale validity and reliability

To verify the scale validity, we performed several analyses to examine its content validity and construct validity. Validity has been defined as the extent to which an instrument is capable of measuring what it intends to measure (Erkuş, 2003; Polit, Beck, & Hungle, 2001; Tezbaşaran, 1996). According to Akgül (1997), validity is the fitness of a survey instrument to serve its intended purpose.

As part of the cross-cultural adaptation, while creating the Turkish version of the scale, we rearranged the translated statements to match Turkish sentence structure in order to ensure better comprehension by the Turkish audience. Thus, instead of simply producing literal translations of items, we socially and culturally adapted the items into Turkish language without making any changes in the meaning of the terms or constructs used in the items.

In calculating Kendall's coefficient of concordance to evaluate inter-rater reliability, the desired concordance value is  $W = 1$ , denoting complete agreement (Tavşancıl, 2002). Any Kendall  $W$ -value over 0.80 is usually accepted as an indication of almost perfect unanimity among the raters (Büyükoztürk, 2007). In our study, Kendall's coefficient was found as 0.923, which demonstrated high concordance among our experts, indicating an adequate content validity. Therefore, the question "Does the CAS accurately measure what is supposed to measure?" was positively answered with these results, confirming that the culturally adapted version of the scale was capable of measuring what it intended to measure and appropriate for use in undergraduate nursing students.

The Bartlett's test of sphericity (BS) is conducted to determine whether the observed correlation matrix is equal to the identity matrix, which demonstrates that the set of factors are unsuitable for

## Scree Plot

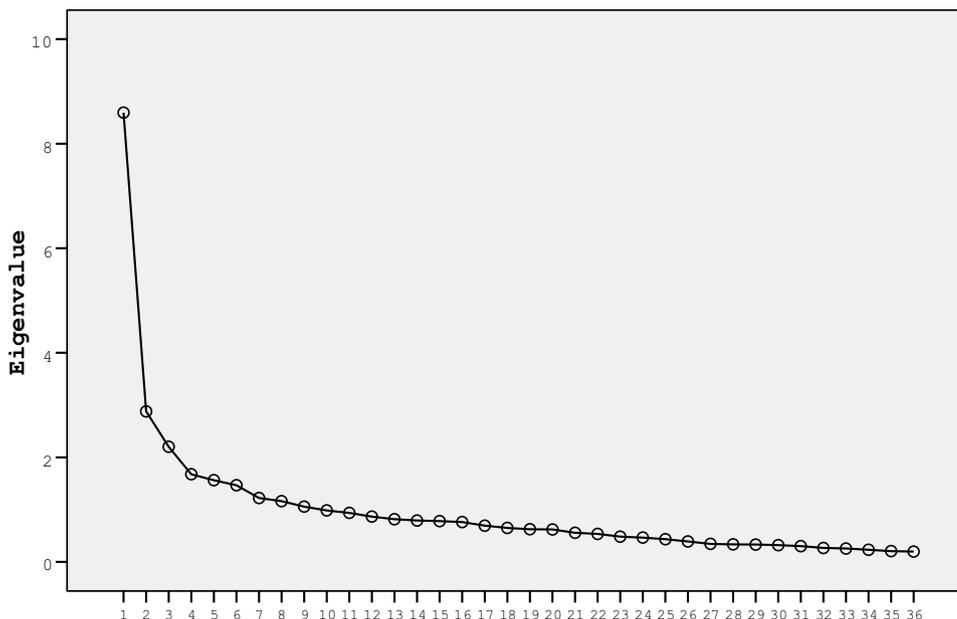


Fig. 1. The Resulting Scree Plot of The CAS.

**Table 1**  
Factor Groups and Factor Analyses of the CAS.

	Item Numbers	Explained Variance	Subscales Cronbach's Alpha	Total Scale Cronbach's Alpha
Factor 1	10,13,14,18,21,23,24,25,26,27,28,30,31	23.870	0.868	0.897
Factor 2	5,6,7,11,15,17,20	7.997	0.761	
Factor 3	8,9,12,16,19,22,32,33,34,35,36	6.118	0.753	
Factor 4	1,2,3,4,29	4.657	0.751	

factor analysis (Akgül, 1997; Polit, 1996). The sphericity test results showed satisfactory results, with approximate chi-square values of  $\chi^2 = 2676.007$ ,  $DF = 630$  ( $p < 0.000$ ). In measuring sampling adequacy, the preferred method is calculating the Kaiser-Meyer-Olkin (KMO) index. Used to assess appropriateness for factor analysis, the KMO index predicts the scale of the difference between the observed correlations and partial correlations (Akgül, 1997). A resulting value closer to 1.0 indicates that a set of variables is suitable for factor analysis. The KMO index values between 0.90 and 1.00 are usually interpreted as perfect sampling adequacy scores (Tavşancıl, 2002). In the current study, the overall KMO sampling adequacy score was 0.843 for this set of data. The results of BS and KMO tests demonstrated that correlation matrix derived from the correlations between factors was appropriate for a factor analysis (Akgül, 1997; Tavşancıl, 2002).

A common statistical procedure, factor analysis typically aims to reduce a large number of variables to fewer factors by uncovering any independent dimensions underlying (Polit et al., 2001). In a survey instrument, the underlying dimensions addressing certain concepts and domains might not always be perceived in the same way by the new linguistic group for which the cross-cultural adaptation is conducted. At times, certain items in a questionnaire need to be omitted, whereas the original factor structure should be maintained as much as possible (Gözüm & Aksayan, 2003). While deciding how many factors to retain, majority of the studies use the Kaiser criterion, where all factors with eigenvalues above 1 are traditionally considered as reliable factors. Other methods described for determining the number of factors to retain include Kaiser-normalization and scree plot (Tavşancıl, 2002).

In the construct validity assessment, the factor structure of the scale was analyzed through a principal component analysis (PCA) using varimax rotation strategy, and only those components with eigenvalues above 1 were considered significant. The results of PCA showed 9 factors with an eigenvalue above 1. After the inclusion of respective items into the most appropriate factor group, a four-factor structure solution was confirmed for the adapted version of the CAS. The factor structure achieved in the Turkish language version was slightly different from that of the original scale, which may have been resulted from sociocultural differences between the target populations. The original developers Rew et al., and Krainovich et al. reported that five different factors emerged in the original CAS scale, which included general educational experiences, research issues, awareness of attitudes, classroom and clinical instruction, patient care/clinical practice (Krainovich et al., 2008; Rew et al., 2003). In the present study, the four-factor solution for our version of the scale explained a 42.6% of the total variance. Our findings showed that the form structure of the Turkish language version of the CAS varied in composition as compared to the original scale.

A psychometric instrument may not be considered a valid tool unless a series of tests confirms its reliability. The term 'reliability' refers to the degree to which a measurement yields results that are accurate and consistent. Reliability studies are generally conducted to establish and quantify reproducibility of a survey instrument by analyzing the consistency of results on repeated measures (Polit & Beck, 2004). In their study, Rew et al. (2003) reported that the internal consistency estimate of reliability for the total scale was 0.91 for students and 0.82 for faculty members. They also computed Cronbach's alpha scores for the subscales, which ranged from

**Table 2**  
Item Total Score Average, Item-Total-Item Correlation and Item-Total-Item Correlation of Item Deleted.

Item No	Mean Item-total scores and standard deviations	Item-total scores correlation values	Alpha if item deleted
1	4.17 ± 1.66	0.533	0.892
2	3.56 ± 1.72	0.505	0.893
3	3.42 ± 1.63	0.346	0.895
4	3.63 ± 1.66	0.394	0.894
5	4.35 ± 1.95	0.322	0.896
6	5.13 ± 1.68	0.417	0.894
7	5.27 ± 1.75	0.429	0.894
8	4.48 ± 1.18	0.313	0.895
9	4.11 ± 1.47	0.223	0.897
10	4.57 ± 1.78	0.281	0.896
11	4.01 ± 1.88	0.250	0.897
12	3.71 ± 1.52	0.049	0.899
13	3.18 ± 1.86	0.319	0.896
14	4.88 ± 1.89	0.577	0.891
15	4.75 ± 1.98	0.437	0.894
16	4.48 ± 1.34	0.231	0.896
17	4.55 ± 1.80	0.335	0.895
18	3.87 ± 1.79	0.465	0.893
19	3.77 ± 1.94	0.236	0.897
20	4.34 ± 1.75	0.384	0.895
21	4.26 ± 1.66	0.647	0.890
22	3.71 ± 1.44	0.147	0.898
23	4.42 ± 1.88	0.527	0.892
24	3.95 ± 1.89	0.416	0.894
25	4.85 ± 1.77	0.523	0.892
26	4.53 ± 1.73	0.612	0.891
27	4.27 ± 1.72	0.586	0.891
28	4.15 ± 1.68	0.598	0.891
29	3.58 ± 1.84	0.323	0.896
30	4.07 ± 1.67	0.521	0.892
31	4.19 ± 1.71	0.553	0.892
32	5.55 ± 1.64	0.624	0.891
33	5.14 ± 1.64	0.537	0.892
34	5.27 ± 1.68	0.560	0.892
35	5.09 ± 1.70	0.554	0.892
36	3.68 ± 1.70	0.232	0.897

0.66 (awareness of attitudes) to 0.88 (clinical practice) for the students, while in faculty version alpha coefficients were found to range from 0.56 to 0.87. Krainovich et al. reported a Cronbach's alpha coefficient of 0.869 for the total scale, and subscale alpha coefficients between 0.687 and 0.902. (Krainovich et al., 2008). A Cronbach's alpha value is used to estimate the reliability of an instrument, and resulting reliability coefficients may range from 0.0 to 1.00, where greater overall scores indicate higher reliability of a generated scale. According to Özdamar, Cronbach's alpha scores between 1 and 0.8 ( $1.0 > \alpha \geq 0.8$ ) indicate good internal consistency, and the scale is highly reliable. The Cronbach's alpha coefficient of the Turkish language version of the CAS was calculated as 0.897, which may be interpreted as strong intercorrelations between the scale items. In other words, all items were found to measure the same construct intended, and the generated scale was homogeneous, offering a reliable measurement (Özdamar, 2004). Finally, the item-total correlation coefficients for the dimensions of cultural competence ranged from 0.147 to 0.647, which indicated a high internal consistency of the scale.

## 5. Conclusion

Owing to an increasingly diverse population in Turkey, the need to equip the current and new nursing staff with a set of skills to provide a culturally competent care has increased. Our findings indicate that the adapted Turkish version of the CAS is a valid and reliable instrument for use in Turkish nursing students. The CAS can serve as a reliable measurement tool for assessing the initial outcomes of a course to promote cultural competence in

nursing students. Nursing faculties can utilize this psychometric instrument to effectively assess the cultural competence level of their students, which might produce valuable results to allow re-evaluation of their instructional strategies designed to improve cultural competence among nursing students.

## 6. Limitations

It will be necessary to test its validity and the reliability with larger samples to ensure its generalizability.

## 7. Relevance to clinical practice

- It may also lead to further studies involving adaptation efforts for the Cultural Awareness Scale.
- The adapted Turkish version of the Cultural Awareness Scale can be utilized by various health-related schools to effectively assess and determine the cultural awareness levels of their students training to be healthcare professionals.
- The scale may provide a systematic assessment process leading to key improvements in the curricula followed by such schools.
- If nursing educators increase cultural awareness of nurse or nursing students, can meet patients expectations and develop upward of nursing care. As a result, self-expression of patient will be positively affected.

## Conflict of interest

None.

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