

The DSM-5 Dimensional Anxiety Scales in a Dutch non-clinical sample: psychometric properties including the adult separation anxiety disorder scale

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Abstract

With DSM-5, the American Psychiatric Association encourages complementing categorical diagnoses with dimensional severity ratings. We therefore examined the psychometric properties of the DSM-5 Dimensional Anxiety Scales, a set of brief dimensional scales that are consistent in content and structure and assess DSM-5-based core features of anxiety disorders. Participants (285 males, 255 females) completed the DSM-5 Dimensional Anxiety Scales for social anxiety disorder, generalized anxiety disorder, specific phobia, agoraphobia, and panic disorder that were included in previous studies on the scales, and also for separation anxiety disorder, which is included in the DSM-5 chapter on anxiety disorders. Moreover, they completed the Screen for Child Anxiety Related Emotional Disorders Adult version (SCARED-A). The DSM-5 Dimensional Anxiety Scales demonstrated high internal consistency, and the scales correlated significantly and substantially with corresponding SCARED-A subscales, supporting convergent validity. Separation anxiety appeared present among adults, supporting the DSM-5 recognition of separation anxiety as an anxiety disorder across the life span. To conclude, the DSM-5 Dimensional Anxiety Scales are a valuable tool to screen for specific adult anxiety disorders, including separation anxiety. Research in more diverse and clinical samples with anxiety disorders is needed. © 2016 The Authors International Journal of Methods in Psychiatric Research Published by John Wiley & Sons Ltd.

Introduction

With the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), the American

Psychiatric Association (APA) strongly encourages researchers and clinicians to supplement the traditional binary diagnosis of disorders with dimensional measures. Dimensional assessment of psychopathology has several

benefits over the traditional categorical diagnosis, such as providing information about disorder severity, subclinical presentations of disorders, and change in symptoms over time (by repeated assessment) (e.g. Helzer *et al.*, 2006; Hudziak *et al.*, 2007). Moreover, dimensional assessment may clarify the problem of diagnostic comorbidity (Krueger *et al.*, 2005; Kraemer, 2007) and may enhance the communication between mental-health professionals (LeBeau *et al.*, 2015).

In the domain of the anxiety disorders, these benefits of dimensional assessments are widely recognized, which is reflected by the measures clinicians and researchers use to assess anxiety. That is, nearly all of the measures to assess anxiety symptoms are of a dimensional nature. However, many scales lack a theoretical basis, have unsatisfactory psychometric properties (Balon, 2005), lack homogeneity in format and content, and are quite lengthy (LeBeau *et al.*, 2012). For that reason, the Anxiety Disorder Subgroup of the DSM-5 Anxiety, Obsessive-Compulsive Spectrum, Post-traumatic, and Dissociative Disorders Work Group developed a set of dimensional measures for the anxiety disorders, the so called DSM-5 Dimensional Anxiety Scales. The DSM-5 Dimensional Anxiety Scales are based on Lang's (1971) tripartite model, in which anxiety is understood as consisting of three different and relatively independent components: behavior, cognition, and physiology. The DSM-5 Dimensional Anxiety Scales use a common template to assess the core features of fear and anxiety that are shared among the anxiety disorders, such as cognitive and physiological symptoms, and avoidance and escape behaviors. Moreover, the scales are concise, which facilitates their administration, especially in clinical practice settings.

Four studies have already tested the psychometric properties of the adult-version of the DSM-5 Dimensional Anxiety Scales in both German and American samples (Beesdo-Baum *et al.*, 2012; LeBeau *et al.*, 2012; Knappe *et al.*, 2013, 2014). In addition, one study tested the psychometric properties of the child and parent-version of the DSM-5 Dimensional Anxiety Scales in a Dutch sample (Möller *et al.*, 2014a). These series of investigations have demonstrated strong psychometric properties of the scales in clinical and non-clinical samples. To sum up, high reliability, convergent and discriminant validity, test-retest reliability, sensitivity to clinical severity, and sensitivity to change were found. Of note, the psychometric properties of the scales were substantially weaker for specific phobia, which may be due to the heterogeneity of the disorder (i.e. the different specific phobias are distinct in nature). This scale is therefore in need of more evaluation.

Moreover, in the four studies examining the psychometric properties of the DSM-5 Dimensional Anxiety

Scales in adults (i.e. Beesdo-Baum *et al.*, 2012; LeBeau *et al.*, 2012; Knappe *et al.*, 2013, 2014), participants completed the scales for five anxiety disorders (social anxiety disorder [SAD], generalized anxiety disorder [GAD], specific phobia [SP], agoraphobia [AG], and panic disorder [PD]). In the present study, a dimensional scale was also administered for separation anxiety disorder (SepAD). A literature review by Bögels *et al.* (2013) showed that SepAD is a prevalent, often comorbid, and debilitating disorder in adulthood. There is evidence that a considerable amount of adults report the first onset of the disorder in adulthood. For that reason, in DSM-5 (APA, 2013) SepAD is classified under the anxiety disorders instead of under the section "Disorders Usually First Diagnosed in Infancy, Childhood, or Adolescence" as it was in the DSM-IV (APA, 2000). Therefore, we were specifically interested in adults' responses on the DSM-5 Dimensional Anxiety Scales for SepAD.

In the present study, we again investigated the psychometric properties of the DSM-5 Dimensional Anxiety Scales, but now in a Dutch adult population. In contrast to the four previous studies on adults in which the mean age of the participants ranged from 20 to 35 years, our sample was relatively older (mean age 44 years). The objective of this paper was to examine the reliability, validity, and clinical sensitivity of the DSM-5 Dimensional Anxiety Scales in a non-clinical Dutch sample of adults, including a scale for SepAD (as this disorder was overlooked as an adult anxiety disorder in DSM-IV and was not part of previous DSM-5 dimensional assessment of anxiety disorders research). As anxiety disorders are more common in women than men (Craske, 2003; McLean and Anderson, 2009), and as anxiety symptoms differ in type and severity between men and women (Bekker and Van Mens-Verhulst, 2007), psychometric properties of the DSM-5 Dimensional Anxiety Scales were investigated for males and females separately.

Methods

Participants

Participants consisted of parents of 8 to 13 year old children, recruited from eight elementary schools in both rural and urban areas of the Netherlands. The recruited children and parents also participated in a study on the psychometric properties of the DSM-5 Dimensional Anxiety Scales in children (Möller *et al.*, 2014a) and in a study on the influence of fathers' versus mothers' anxious or confident social referencing signals in ambiguous situations (Möller *et al.*, 2014b). Of the 898 children invited to participate 394 children (44%) agreed. Twelve children

were excluded from the study as they were absent on the day of testing or due to missing data. The sample of parents that participated consisted of 285 females and 255 males. Table 1 shows the characteristics of the participants.

Assessments

DSM-5 Dimensional Anxiety Scales

The Anxiety Disorder Subgroup of the DSM-5 Anxiety, Obsessive-Compulsive Spectrum, Post-traumatic, and Dissociative Disorders Work Group developed the initial version of the DSM-5 Dimensional Anxiety Scales and the scales were revised by LeBeau *et al.* (2012). Originally, the DSM-5 Dimensional Anxiety Scales assess five anxiety disorders: SAD, GAD, SP, AG, and PD. In the current study, we also used a dimensional scale for SepAD. All six scales share a common template that assesses the frequency of cognitive and physical symptoms and the frequency of escape and avoidance behaviors that are present across all anxiety disorders. To create disorder-specific dimensional scales, the scales are adapted for each disorder through the use of different introductory statements and different reference points throughout the items. Each dimensional scale consists of 10 items, with the first five items assessing the frequency of cognitive and physical symptoms related to the experience of fear and anxiety (e.g. “I had thoughts of bad things happening”, “I felt tense muscles, on edge or restless, or had trouble relaxing in these situations”) and the second set of five items assessing the frequency of escape and avoidance behaviors (e.g. “I moved away from these situations or left them early”, “I have distracted myself to avoid thinking about these situations”). In contrast to the version of the DSM-5 Dimensional Anxiety Scales that the APA published online which uses a seven-day timeframe, in our study items were assessed in regard to the past four weeks to facilitate the comparison with the results of the previous studies on the scales, which all used a four-week

timeframe. Items are rated on a five point Likert scale ranging from 0 (never) to 4 (all of the time). A total score can be created for each dimensional scale by summing the scores on the 10 items (possible scores ranging from 0 to 40). In addition, a total score across all six dimensional scales can be created by summing the total scores for each dimensional scale (possible scores ranging from 0 to 240). To translate the DSM-5 Dimensional Anxiety Scales from English into Dutch, the first author translated the scales into Dutch and a native English speaker who was not familiar with the questionnaire translated them back into English.

Screen for Child Anxiety Related Emotional Disorders Adult version

Participants completed the Screen for Child Anxiety Related Emotional Disorders Adult version (SCARED-A; Bögels and Van Melick, 2004; Van Steensel and Bögels, 2014), a screening tool for identifying anxiety disorders in adults. The SCARED-A assesses a range of DSM-IV based anxiety symptoms that can be divided into symptoms of PD (13 items), GAD (9 items), SAD (9 items), SepAD (12 items), SP (15 items), obsessive-compulsive disorder (9 items), and post-traumatic stress disorder (4 items). Items on obsessive-compulsive disorder and post-traumatic stress disorder were omitted because they are no longer part of the anxiety disorders in DSM-5 (APA, 2013). Participants rated how frequently they experienced each of the remaining 58 anxiety symptoms on a three-point Likert scale (almost never = 0; sometimes = 1; often = 2). The internal consistency of the SCARED-A total score is excellent (Cronbach's alpha > 0.90), the internal consistencies of the SCARED-A subscales are moderate to high, with Cronbach's alpha values > 0.70, and the SCARED-A discriminates between adults with and without anxiety disorders (Van Steensel and Bögels, 2014). In our sample, Cronbach's alpha's ranged from 0.67 to 0.93, indicating a moderate-to-high level of internal consistency (see Table 2).

Table 1. Characteristics of the participants

	Males (<i>n</i> = 255)	Females (<i>n</i> = 285)
Age (mean [<i>M</i>], standard deviation [<i>SD</i>])	45.30 (5.55)	43.09 (4.56)
Born in the Netherlands (<i>n</i> , %)	227 (89%)	255 (89%)
Working fulltime (<i>n</i> , %)	210 (82%)	31 (11%)
Number of children (<i>M</i> , <i>SD</i>)	2.66 (1.54)	2.59 (1.54)
Educational level (<i>M</i> , <i>SD</i>) ¹	5.91 (1.91)	5.60 (1.96)

¹On a scale from 0 (primary education) to 8 (university).

Table 2. Cronbach's alphas (α) for the SCARED-A total score and subscales

SCARED-A scale	Males		Females	
	α	n	α	n
SAD	0.84	247	0.85	279
GAD	0.81	251	0.84	279
SP	0.71	241	0.79	277
PD	0.68	246	0.80	277
SepAD	0.67	246	0.71	268
Total score	0.87	227	0.93	254

Note: SAD, social anxiety disorder; GAD, generalized anxiety disorder; SP, specific phobia; PD, panic disorder; SepAD, separation anxiety disorder.

Procedure

The ethical committee of the University of Amsterdam approved the study and participants signed informed consent before taking part in the study. After children had completed the questionnaires at school, they received the questionnaires for their parents, including a post-free return envelope. Fathers and mothers completed the questionnaires at home and mailed them back to the university. Completing the questionnaires lasted approximately 60 minutes. Parents received a compensation of 10 euro, schools a compensation of 100 euro per 60 participating children, and children received a small gift.

Results

Descriptive statistics

Non-parametric tests were used, as data were not normally distributed. The means, standard deviations, and ranges of responses to the DSM-5 Dimensional Anxiety Scales and SCARED-A are depicted in Table 3. Wilcoxon's signed rank test showed that females scored higher than males on all DSM-5 Dimensional Anxiety Scales, all p values < 0.001 . Inspecting the relative presence of each disorder (each DSM-5 Dimensional Anxiety Scale score divided by the total score on all DSM-5 Dimensional Anxiety Scales), Wilcoxon's signed rank test showed no differences between males and females, all p values > 0.05 , indicating that the relative presence of each of the anxiety disorders symptoms (including SepAD symptoms) did not differ for men and women.

Internal consistency

Cronbach's alpha coefficients were calculated for each DSM-5 Dimensional Anxiety Scale (Table 4). Cronbach's

Table 3. Descriptive statistics for the DSM-5 Dimensional Anxiety Scales and the SCARED-A

	N	Mean total score		Possible range	
		(standard deviation)	Range	Range	range
Males					
<i>Dimensional scales</i>					
SAD	254	2.54 (3.65)	0–17	0–40	0–40
GAD	248	3.73 (4.43)	0–21	0–40	0–40
SP	248	2.82 (5.09)	0–40	0–40	0–40
AG	252	1.04 (2.90)	0–20	0–40	0–40
PD	254	1.08 (3.59)	0–33	0–40	0–40
SepAD	253	1.32 (3.24)	0–31	0–40	0–40
<i>SCARED-A subscales</i>					
SAD	247	2.31 (2.67)	0–13	0–18	0–18
GAD	251	2.96 (2.79)	0–14	0–18	0–18
SP	241	3.68 (3.16)	0–16	0–30	0–30
PD	246	1.19 (1.60)	0–11	0–26	0–26
SepAD	246	2.73 (2.28)	0–10	0–24	0–24
Females					
<i>Dimensional scales</i>					
SAD	283	3.95 (5.23)	0–25	0–40	0–40
GAD	282	5.79 (5.80)	0–29	0–40	0–40
SP	276	5.40 (7.26)	0–38	0–40	0–40
AG	280	1.94 (4.31)	0–34	0–40	0–40
PD	280	1.63 (4.56)	0–40	0–40	0–40
SepAD	283	3.07 (5.47)	0–33	0–40	0–40
<i>SCARED-A subscales</i>					
SAD	279	3.66 (3.24)	0–13	0–18	0–18
GAD	279	3.94 (3.30)	0–14	0–18	0–18
SP	277	5.59 (4.30)	0–20	0–30	0–30
PD	277	2.14 (2.51)	0–19	0–26	0–26
SepAD	268	3.56 (2.81)	0–15	0–24	0–24

Note: SAD, social anxiety disorder; GAD, generalized anxiety disorder; SP, specific phobia; AG, agoraphobia; PD, panic disorder; SepAD, separation anxiety disorder.

alphas were high for both males (range = 0.86–0.94) and females (range = 0.89–0.95), indicating a high level of homogeneity, also for the SP scale.

Convergent and discriminant validity

To investigate the validity of the DSM-5 Dimensional Anxiety Scales, Spearman's correlations were calculated between each DSM-5 Dimensional Anxiety Scale and each subscale of the SCARED-A. These correlations for

Table 4. Cronbach's alphas (α) for the six DSM-5 Dimensional Anxiety Scales

Dimensional scale	Males		Females	
	α	n	α	n
SAD	0.86	254	0.91	283
GAD	0.88	248	0.90	282
SP	0.93	248	0.93	276
AG	0.91	252	0.94	280
PD	0.94	254	0.96	280
SepAD	0.90	253	0.94	283

Note: SAD, social anxiety disorder; GAD, generalized anxiety disorder; SP, specific phobia; AG, agoraphobia; PD, panic disorder; SepAD, separation anxiety disorder.

conceptually similar and distinct measures were then statistically compared with a Fisher r -to- z test. Spearman's correlations between the total score of each DSM-5 Dimensional Anxiety Scale and the total score of each SCARED-A subscale are shown in Table 5. For both males and females, moderate to high correlations appeared between each DSM-5 Dimensional Anxiety Scale and the corresponding subscale of the SCARED-A (all p

values < 0.01), indicating some convergent validity. Discriminant validity was only demonstrated for GAD (for both males and females), and not for SAD, SP, PD, and SepAD. Validity could not be calculated for AG, as the current version of the SCARED-A does not measure AG.

Clinical sensitivity

To assess clinical sensitivity of the DSM-5 Dimensional Anxiety Scales, Mann-Whitney U tests were used to investigate whether participants who exceeded the cutoff on the SCARED-A scored significantly higher on the DSM-5 Dimensional Anxiety Scales than those who scored below the cutoff. The following cutoff scores were used: for males, SCARED-A total score ≥ 20 , for females, SCARED-A ≥ 30 (Van Steensel and Bögels, 2014). Males who exceeded the SCARED-A cutoff scored higher (mean rank = 179.61, $n = 37$) on the DSM-5 Dimensional Anxiety Scales than males who did not (mean rank = 101.22, $n = 190$), $U = 1087.50$, $p < 0.001$. In addition, females who exceeded the SCARED-A cutoff scored higher (mean rank = 206.76, $n = 40$) on the DSM-5 Dimensional Anxiety Scales than females who did not (mean rank = 112.68, $n = 214$), $U = 1109.50$, $p < 0.001$.

Table 5. Spearman's correlations between the DSM-5 Dimensional Anxiety Scales and the SCARED-A for males and females

Dimensional scales	SCARED SAD	SCARED GAD	SCARED SP	SCARED PD	SCARED SepAD
<i>Males (n = 250)</i>					
SAD	0.50 (ref)	0.50	0.25**	0.43	0.32*
GAD	0.32**	0.59 (ref)	0.23**	0.26**	0.37**
SP	0.13*	0.20	0.32 (ref)	0.20	0.18
AG	0.24	0.25	0.21	0.26	0.13
PD	0.29	0.28	0.20	0.33 (ref)	0.17 [†]
SepAD	0.34	0.40	0.20**	0.22**	0.43 (ref)
<i>Females (n = 278)</i>					
SAD	0.50 (ref)	0.51	0.26**	0.35*	0.28**
GAD	0.42**	0.62 (ref)	0.31**	0.47*	0.46**
SP	0.35	0.40	0.37 (ref)	0.39	0.36
AG	0.39	0.51	0.32	0.42	0.38
PD	0.20**	0.40	0.29	0.41 (ref)	0.40
SepAD	0.30**	0.52	0.31**	0.45	0.53 (ref)

Note: SAD, social anxiety disorder; GAD, generalized anxiety disorder; SP, specific phobia; AG, agoraphobia; PD, panic disorder; SepAD, separation anxiety disorder; ref, reference correlation for test of correlated coefficients. AG is not measured in the current version of the SCARED-A, therefore convergent and discriminant validity could not be calculated for AG.

** $p < 0.01$; * $p < 0.05$; [†] $p < 0.10$.

Discussion

In this study, we investigated the psychometric properties of the DSM-5 Dimensional Anxiety Scales, a set of brief self-report scales to assess six anxiety disorders (SAD, GAD, SP, AG, PD, and SepAD), in a Dutch non-clinical sample of adults. The internal consistency of the scales was excellent. Correlations between the DSM-5 Dimensional Anxiety Scales and the corresponding SCARED-A subscales were medium-to-large ($r_s = 0.33\text{--}0.62$), indicating good convergent validity. Moreover, participants who exceeded the SCARED-A cutoff scored higher on the DSM-5 Dimensional Anxiety Scales than those who scored below the cutoff, supporting the clinical sensitivity of the scales. Thus, our results using a Dutch sample replicate previous findings on the good psychometric properties of the scales in Germany and the United States (Beesdo-Baum *et al.*, 2012; LeBeau *et al.*, 2012; Knappe *et al.*, 2013, 2014).

Discriminant validity (i.e. lack of convergence between each DSM-5 Dimensional Anxiety Scale and non-corresponding SCARED-A scales) was only demonstrated for GAD, and not for SAD, SP, PD and SepAD. This may be due to worry being the defining characteristic of GAD, compared to all other anxiety disorders of which anxiety is the core feature (Andrews *et al.*, 2010). In this sense, GAD may be more distinct from the other anxiety disorders, than the other anxiety disorders from each other. Another explanation for the low discriminant validity of the SAD, SP, PD and SepAD scales may be the high overlap among anxiety disorders (e.g. Kroenke *et al.*, 2007). This high overlap among anxiety disorders is exactly one of the reasons why the dimensional approach of assessing domains of anxiety has been included in DSM-5. An alternative explanation for the low discriminant validity may be that the SCARED-A and the DSM-5 Dimensional Anxiety Scales are conceptually too similar to validly assess discriminant validity. To obtain formal tests of discriminant validity from other types of psychopathology (e.g. depression), future studies should include measures assessing domains theoretically distinct from anxiety.

This was the first study including the DSM-5 Dimensional Anxiety Scale to assess adult SepAD. Previous studies assessing the scales in adults (Beesdo-Baum *et al.*, 2012; LeBeau *et al.*, 2012; Knappe *et al.*, 2013, 2014) did not include adult SepAD. Our study showed that the SepAD dimensional scale is just as reliable and valid as the other scales. Moreover, it was shown that SepAD is also present among adults (both men and women even scored higher on SepAD than on PD and AG; see Table 3), which provides support for the recognition of SepAD as an anxiety disorder that is important across the life span,

and not only in childhood (Bögels *et al.*, 2013) and for elimination of the requirement that the disorder needs to start in childhood in DSM-5 (APA, 2013).

In previous studies the psychometric properties of the DSM-5 Dimensional Anxiety Scale for SP were unsatisfactory. In our study, a Cronbach's alpha of 0.93 was found for both males' and females' SP, indicating excellent internal consistency. In addition, we found good convergent validity of the DSM-5 Dimensional Anxiety Scale for SP. Therefore, our results do not support calls for further refinement of the SP scale (e.g. LeBeau *et al.*, 2012; Knappe *et al.*, 2014).

A strength of this study is that we tested the DSM-5 Dimensional Anxiety Scales including for the first time the scale for adult SepAD. There is another adult separation anxiety questionnaire, namely the Adult Separation Anxiety Questionnaire (ASA-27; Manicavasagar *et al.*, 2003), however this questionnaire is substantially longer (27 items) and the attractiveness of the DSM-5 Dimensional Anxiety Scales is that each of the anxiety domains are assessed in exactly the same way. The study findings should, however, be interpreted in the light of several limitations. First, the use of a non-clinical sample may be considered as a limitation, as the scales are primarily developed for use in clinical settings. Second, our sample was quite homogeneous with all participants having children and being of a somewhat limited age range. In addition, almost all participants were married (whereas divorce rates are around 38% in the Netherlands; CBS Statline, 2014) and most had a Caucasian background. This possibly limits the generalizability of our findings. Third, we did not measure the categorical presence of anxiety disorders using a clinical interview, and therefore could examine clinical sensitivity only using the SCARED-A cutoff scores. Fourth, as the SCARED-A does not include a separate subscale for AG, we were unable to assess the convergent and discriminant validity of the DSM-5 Dimensional Anxiety Scale of AG.

It should be noted that although the benefits of a dimensional approach over a traditional categorical approach are widely acknowledged (Krueger *et al.*, 2005; Helzer *et al.*, 2006; Hudziak *et al.*, 2007; Kraemer, 2007), several real and perceived obstacles have hindered the adoption of dimensional assessment measures in clinical practice (LeBeau *et al.*, 2015). First, although the DSM-5 has been published for more than two years, there is still limited awareness of the dimensional component in the DSM-5 and the dimensional measures that accompany it (LeBeau *et al.*, 2015). Second, many clinicians do not value the psychometric properties of dimensional assessment measures, do not see their benefit over clinical judgment

alone, and question the practicality of such measures (Jensen-Doss and Hawley, 2010). Thus, both researchers and clinicians should become aware of the usefulness of this dimensional approach for assessing anxiety problems and the existence of the DSM-5 Dimensional Anxiety Scales. The scales can improve the current diagnostic system by their increased utility and benefits in terms of communication between mental health professionals (LeBeau *et al.*, 2015). With respect to their usefulness, the scales have been published online (see <http://www.psychiatry.org/practice/dsm/dsm5/online-assessment-measures>) and can be downloaded for free, which makes them easily available to both clinicians and patients. In addition, the DSM-5 Dimensional Anxiety Scales are very brief and can thus be completed quickly. Concerning communication, when researchers and clinicians use the same measure to assess severity, scores can be more easily interpreted and compared than when different measures with different cutoff scores and symptom domains are used (LeBeau *et al.*, 2015).

Taken together, the findings of our study support the routine use of the DSM-5 Dimensional Anxiety Scales, although more research on the DSM-5 Dimensional Anxiety Scales is needed, in particular on their test–retest reliability, discriminant validity, and (dis)agreement among clinicians and patients. Particularly for the SepAD scale

comparison with SepAD as measured using a (semi)structured clinical interview such as the Structured Clinical Interview for DSM-5 Disorders (First *et al.*, 2015) is needed. Moreover, the use of the scales may bridge the gap between community and clinical studies, as data can be better compared when this standardized dimensional measure is used to assess participants' anxiety disorder symptoms.

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Declaration of interest statement

The authors have no competing interests.

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