



# The relationship between adverse childhood experiences and social anxiety disorder symptoms: the mediating role of rumination

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## Abstract

This study aimed to examine the mediating role of rumination in the relationship between adverse childhood experiences and social anxiety disorder symptoms. In this study, which was conducted with correlational design, one of the quantitative research methods, 878 participants were reached. 78.2% of the participants are women and 21.8% are men. In the study, self-report scales consisting of a personal information form, adverse childhood experiences scale, rumination scale, and Liebowitz social anxiety scale were administered to the participants. The analysis of the data regarding the research findings was carried out using the SPSS 25 package program. First of all, the relationship between adverse childhood experiences and social anxiety and rumination was examined; Then, parallel multi-agent analysis and serial intermediary analyses were performed using the Process V4.2 extension (Model 4). According to the findings, it was found that there was a significant positive relationship between adverse childhood experiences, social anxiety disorder symptoms, and rumination variables. It has also been observed that rumination has a mediating role in the relationship between adverse childhood experiences and social anxiety disorder symptoms. Examining the role of rumination in the relationship between childhood adverse events and social anxiety symptoms may help develop new interventions targeting SAD and expand the literature on the cognitive, behavioral, and affective vulnerabilities that early adverse events bring with them.

**Keywords** Adverse childhood experiences · Rumination · Social anxiety

## Introduction

Social anxiety disorder (SAD) is defined as a state of fear or anxiety that occurs prominently when an individual is evaluated by others in society (APA, 2013; Köroğlu, 2014). Research shows that social anxiety disorder is one of the most common mental disorders in society, after depression and substance use (Memik et al., 2011). According to epidemiological studies, the lifetime prevalence of SAD

is estimated to be 2.8–13.0%. SAD is usually chronic and the age of onset can vary between the ages of 13 and 15 (Ertan, 2008). It is rare for it to occur after the age of 25 (Schneier et al., 1992). Although the onset in childhood and adolescence overlaps with observable sensitivities to social embarrassment (Ollendick & Hirshfeld-Becker, 2002), the development of social phobia after these age periods is relatively rare and can be said to be specific to cases that occur secondary to another mental disorder (e.g. depression), eating disorders, psychotic disorders) (Rossellini et al., 2013). Although social anxiety disorder negatively affects the social functionality of the individual, individuals with this disorder may experience conditions such as depressive disorder, other anxiety disorders, and alcohol and substance abuse (Gökalp et al., 2001; Lépine & Lelouch, 1995). In addition, the majority of individuals with social anxiety disorder may experience problems that affect their functionality, such as dropping out of school, decreasing productivity at work, and decreasing quality of life (Leichsenring & Leweke, 2017; Patel et al., 2002; Wittchen et al., 2000). When looking at the etiology of social anxiety

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disorder; Factors such as cognitive misinterpretation and adverse social learning experiences are effective (Rapee & Spence, 2004). These early adverse social learning experiences, such as family attitudes such as overprotectiveness, critical approach, rejection, lack of interest, psychological control, or traumatic experiences, can be expressed as adverse childhood experiences (ACE) (Knappe et al., 2009; Nanda et al., 2016).

Adverse childhood experiences are a broad concept that covers negative experiences encountered during childhood that may have direct or indirect effects on a person's physical, psychological, or social characteristics. This concept was defined as "childhood abuse and domestic dysfunction" by Felitti et al. (1998). In later studies, this definition was expanded and used to express potential traumatic events such as various abuse, neglect, and domestic dysfunction that occurred before the age of 18 (Bryant et al., 2020). The World Health Organization defines 5 types of childhood trauma; physical, sexual, emotional abuse, and, just as important, physical and emotional neglect. The most common childhood traumatic experience is neglect (78%), followed by physical abuse (17%), sexual abuse (9%) and psychological abuse (8%) (Nanda et al., 2016). In studies, emotional abuse, which is among the negative experiences of childhood, was found to be a predictor of social anxiety (Gibb et al., 2007; Lochner et al., 2010; Nanda et al., 2016). In this regard, adverse childhood experiences can be stated as an important element in the development of social anxiety disorder (Kuo et al., 2011). Childhood traumatic experiences have negative long-term effects on the physical and cognitive functioning of the brain, resulting in physical, cognitive, and emotional symptoms persisting into adulthood (Dye, 2018). According to Briere (1996), early traumatic events may result in various cognitive distortions. Individuals' assumptions about themselves, others, the environment, and the future may be distorted by early adverse childhood events. Such cognitive distortions about safety (e.g., "I'm in danger"), controllability (e.g., "I'm helpless" or "there's no hope"), and internal attribution (i.e., self-blaming or self-criticism) are associated with symptoms of Post Traumatic Stress Disorder (PTSD), anxiety and depression. Indeed, cognitive distortions are found to mediate the link between childhood traumatic experiences and later psychological adjustment (Kim et al., 2017). Childhood trauma is considered a risk factor for the development of behavioral (e.g. experiential avoidance) and cognitive (e.g., rumination) patterns in children and adults, which make them more susceptible to psychological issues (Ghazanfari, 2018; Gümüşsoy et al., 2021). Individuals with childhood adverse events may exhibit cognitive, affective, and behavioral vulnerabilities such as anxiety, rumination and avoidance (Barlow & Goldsmith, 2014). The predictive role of early traumatic events

in anxiety, rumination, and avoidance is well-established in the literature (Nanda et al., 2016). Moreover; anxiety, rumination, and avoidance are among the symptoms of PTSD. These cognitive (i.e. rumination) and behavioral (i.e. avoidance) vulnerabilities also play a role in the development and persistence of anxiety disorders such as social anxiety disorder (Fıstıkçı et al., 2015).

The role of rumination after adverse experiences in the past in SAD becoming chronic has been proven by various studies (Abbott & Rapee, 2003; Wells et al., 1995; Mellings & Alden, 2000). Individuals with SAD may show rumination after social interaction or performance (Wells et al., 1995).

Ruminations related to social anxiety can cause the person to fail academically, experience a feeling of social inadequacy, deteriorate family and peer relationships, and reduce work productivity (Wittchen & Fehm, 2003). In addition, people with negative life experiences in childhood use more maladaptive cognitive emotion regulation strategies such as rumination in adulthood (Tuman & Hurşitoğlu, 2022).

When the literature is examined, separate studies examining the relationship between rumination with social anxiety disorder (Lyumborsky et al., 2015; Rukmini et al., 2014) and the relationship between negative childhood experiences and SAD (Gündüz et al., 2019; Mansueto et al., 2021; Sokolowski et al., 2022). However, there is no study in the literature that examines the role of rumination in the relationship between childhood adverse events and the symptoms of social anxiety. In this context, this study aimed to examine the relationship between social anxiety disorder, adverse childhood experiences, and rumination. It is also thought that the research to be conducted will contribute to the improvement of the social and professional functionality of these individuals by providing a better observation of the clinical processes of social anxiety. Examining the role of rumination in the relationship between childhood adverse events and social anxiety symptoms may help develop new interventions targeting SAD and expand the literature on the cognitive, behavioral, and affective vulnerabilities that early adverse events bring with them.

The hypotheses planned to be investigated in line with the general purpose of this study are as follows;

- H<sub>1</sub>: Rumination would predict social anxiety symptoms and adverse childhood experiences.
- H<sub>2</sub>: Rumination would have a mediating effect on the relationship between adverse childhood experiences and social anxiety symptoms.

## Method

### Participants

The number of participants targeted in this study was targeted as 385, calculated for multiple regression analysis in the G\*power program according to the criteria of  $\alpha=0.05$  error margin,  $1-\beta=0.80$  (power),  $f^2 = 0.02$  effect size, and three independent variables. Before the study, the necessary approval was obtained from the Hasan Kalyoncu University Ethics Committee (letter dated 26/10/2023 and numbered E-97105791-050.01.01-45044). By choosing the convenient sampling method, 878 university students studying in Konya, Karaman, Elazığ, and Istanbul were reached. The link to the survey form used in the research was shared with the students and volunteer students were enabled to participate in the survey online. Descriptive information about the participants is included in Table 1.

Considering the participant characteristics, participants of the current study were primarily women ( $N=687$ , 78.2%). Moreover, based on their perceived economic status, the majority of them (79.8%) put themselves into middle class, which was followed by upper (13.9%) and lower (6.3%) classes. Some demographic aspects regarding family background were also questioned. Most of their parents live together (94.4%), and the vast majority of their family members have no history of addiction (e.g., alcohol, any substance, etc.; 96.6%) or history of mental health issues

(e.g., depression, other mental health diagnosis, suicide and so on; 87.1%). Finally, checking out the educational level of their parents, the majority of their parents hold primary school degrees, which is followed by high school degrees for both their fathers and mothers. The total of college or higher degrees for fathers is 31%, and for mothers, it is 22.5%.

### Instruments

#### Liebowitz social anxiety scale

In this study, the Liebowitz Social Anxiety Disorder Symptom Scale (LSDS) was used to evaluate the social relations and performance status of university students in the context of fear and/or avoidance behavior (Liebowitz, 1987). The validity and reliability study of the Turkish form of the scale was conducted by Soykan et al. (2003). The scale has two dimensions: anxiety and avoidance. However, a general score regarding Social Anxiety Disorder symptoms can be obtained by taking the total score from the scale. The scale consists of 24 items and is a four-point Likert type. High scores on the scale indicate increased anxiety and avoidance. The Cronbach's alpha coefficient calculated for the scale in this study is 0.85.

#### Adverse childhood experiences scale

Within the scope of the research, the Adverse Childhood Experiences Scale developed by Felitti et al. (1998) was used to determine the levels of childhood abuse, neglect, and trauma exposure of university students. The Turkish validity/reliability study of the questionnaire was conducted by Gündüz et al. (2018) as the Adverse Childhood Experiences Scale (Cronbach alpha internal consistency = 0.46 coefficient = 0.74). The scale consists of yes/no questions that begin with the root phrase "While you were growing up, in the first 18 years of your life..." Questions relate to issues of childhood abuse, neglect, and trauma exposure. The score range for the 10-item negative childhood experiences scale is between 0 and 10. Zero indicates no exposure to adverse childhood experiences and 10 indicates the highest possible score. In this study, the reliability of the scale based on internal consistency was determined by calculating the Cronbach's alpha coefficient. The alpha coefficient calculated for the scale is 0.72.

#### Rumination scale

In this study, the Rumination Scale was used to determine to what extent university students used ruminative coping styles. The Turkish adaptation of the scale developed by

**Table 1** Frequencies for demographic variables

Variable	Frequency	Percent	Valid Percent	Cumulative Percent
Gender	191 men	21.8	21.8	100
	687 women	78.2	78.2	
Family Marital Status	49 separate	5.6	5.6	100
	829 together	94.4	94.4	
Income based class	55 lower	6.3	6.3	100
	701 middle	79.8	79.8	
	122 upper	13.9	13.9	
Educational Status (Mother)	503 Primary	57.3	57.3	100
	177 High	20.2	20.2	
	36 College	4.1	4.1	
	152 University	17.3	17.3	
Educational Status (Father)	10 Graduate level	1.1	1.1	100
	345 Primary	39.3	39.3	
	261 High	29.7	29.7	
	50 College	5.7	5.7	
	182 University	20.7	20.7	
Living with an Addicted family Member	40 Graduate level	4.6	4.6	
	848 No	96.6	96.6	100
Family History with Mental Disorder or Suicide	30 Yes	3.4	3.4	
	765 No	87.1	87.1	100
	113 Yes	12.9	12.9	

Nolen-Hoeksema and Morrow (1991), which evaluates the degree to which individuals use ruminative coping styles, was carried out by Erdur-Baker and Bugay (2012). The scale is a four-point Likert type and consists of 10 items. The scale has two subscales: “obsessive thinking”, which involves passive comparison of the current situation with unmet expectations, and “deep thinking”, which involves mental efforts to overcome problems and difficulties. High scores on the scale indicate high levels of ruminative behavior. Cronbach’s alpha values calculated for the scale were between 0.75 and 0.85 (Erdur-Baker & Bugay, 2012). In this study, the Cronbach’s alpha coefficient calculated for the overall scale is 0.82.

## Procedure

In the first stage, the participants were given a participant information and consent form, and after they were informed about the study and their consent to participate in the study was obtained, self-report scales consisting of the Personal Information Form, Adverse Childhood Experiences Scale, Rumination Scale, and Liebowitz Social Anxiety Disorder Symptoms Scale were applied.

Before conducting the primary analyses, several preliminary analyses were undertaken, encompassing an examination of scale characteristics, correlations among the study variables, and an assessment of normality assumptions using skewness and kurtosis scores (with an absolute value less than 2; Kline, 2015). Following the preliminary analyses, two mediation models were investigated separately for each subdimension of social phobia, namely anxiety and aversion. In other words, two different basic mediation model tests were carried out to examine the mediating role of rumination for the relationship between childhood adverse experiences and subdimensions of social phobia by utilizing the PROCESS macro (Model 4) for SPSS version 3.4 (Hayes, 2017). The findings of the model were analyzed by interpreting standardized path estimate ( $\beta$ ) scores and squared-multiple correlations ( $R^2$ ), utilizing conventional effect size thresholds: small (0.01–0.059), moderate (0.06–0.139), and large ( $\geq 0.14$ ), as defined by Cohen (1988). Moreover, a comprehensive examination was run to explore the implementation of the bootstrap method with 5000 resamples to estimate the 95% confidence intervals (CI) for the indirect

effect (Hayes, 2017). All analytical procedure was implemented by using SPSS (version 25).

## Results

To begin, initial analyses were conducted to examine descriptive statistics, observed scale characteristics, normality assumptions, and correlations among the variables in the study. As presented in Table 1 below, skewness and kurtosis values ranged between  $\leq |2|$ , indicating that the normality assumption was met as the skewness and kurtosis scores fell in the desired cut-off values (Kline, 2015). Furthermore, internal reliability ( $\alpha$ ) values of the study variables ranged between 0.70 and 0.89, all fell above the acceptable threshold.

After the descriptive statistics, Pearson correlation analysis was computed among the main study variables. The results revealed small to strong correlations. In this regard, childhood adverse experiences were positively associated with anxiety, avoidance, and rumination. A strong positive correlation existed among the anxiety and avoidance dimensions of social phobia, as well. In addition, positive associations were captured between rumination, anxiety and avoidance. All descriptives and correlational findings are listed in Table 2.

After examining the preliminary analyses, two mediation models were tested to see the mediating role of rumination regarding the relationship between adverse childhood experiences and the subdimension of social phobia, namely anxiety and avoidance. First of all, whether rumination mediated the effect of trauma on anxiety was questioned. Adverse childhood experiences and rumination were calculated using total scores. Social phobia was determined using the anxiety and avoidance subscale, which was added to the scores individually. Mediation analysis results showed that adverse childhood experiences significantly and positively predicted rumination ( $\beta=0.26$ ,  $p<.001$ ). Moreover, both adverse childhood experiences ( $\beta=0.08$ ,  $p<.05$ ) and rumination ( $\beta=0.33$ ,  $p<.001$ ) were positive predictors of anxiety. Trauma and rumination together explained 13% of the variance in anxiety (a medium effect size; see Cohen, 1988). In terms of the indirect effect, rumination partially mediated the relationship between adverse childhood experiences and

**Table 2** Descriptive statistics and correlations

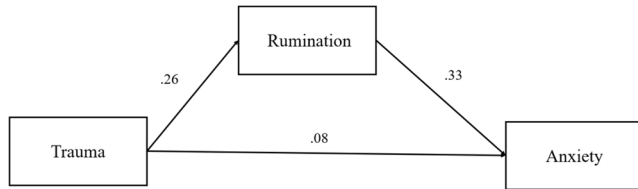
	<i>N</i>	$\bar{x}$	SD	Skew.	Kurtos.	$\alpha$	1	2	3	4
1. Anxiety	878	48.28	14.24	0.659	−0.041	0.85	-			
2. Avoidance	878	43.76	13.72	0.850	0.604	0.89	0.89**	-		
3. Adverse Childhood Experiences	878	1.54	1.73	1.160	0.934	0.70	0.16**	0.13**	-	
4. Rumination	878	24.38	6.18	0.414	−0.162	0.87	0.35**	0.33**	0.26**	-

\*\*  $p < .01$

**Table 3** Unstandardized coefficients for the mediation model for Anxiety subdimension

Predictor	Outcome				Y (Anxiety)			
	M (Rumination)				Y (Anxiety)			
	Coeff.	SE	t	p	Coeff.	SE	t	p
X (ACE)	0.91	0.11	7.90	0.000	0.65	0.27	2.41	0.015
M (Rumination)	-	-	-	-	0.75	0.07	10.06	0.000
Constant	22.96	0.27	85.10	0.000	28.81	1.83	15.74	0.000
<i>Indirect effect of ACE on anxiety through rumination</i>								
	Coeff.	Boot SE	Boot LLCI 95%		Boot ULCI 95%			
	0.69	0.01	0.059		0.112			

SE Standard error, X Independent variable, M Mediator, Y Dependent variable, LL Lower level, UL Upper level. Bootstrapping method = 5000 resampling. ACE Adverse Childhood Experiences



**Fig. 1** Mediation model for anxiety with standardized estimates<sup>a</sup> (<sup>a</sup>Trauma: adverse childhood experience, anxiety: social anxiety disorder)

anxiety ( $\beta=0.08$ , 95% CI=0.060, 0.112). All findings are represented in Table 3; Fig. 1.

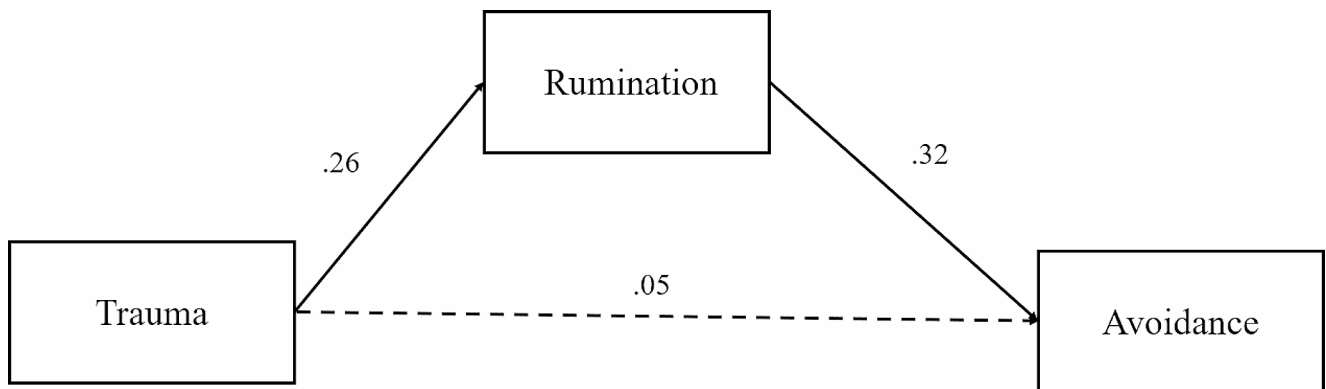
Then, the same mediation analysis was repeated regarding another subdimension of social phobia, called avoidance.

Similarly, adverse childhood experiences significantly and positively predicted rumination ( $\beta=0.26$ ,  $p<.001$ ). Additionally, rumination ( $\beta=0.32$ ,  $p<.001$ ) was again a significant positive predictor of avoidance, like anxiety, but it was not the situation for adverse childhood experiences ( $\beta=0.05$ ,  $p=.14$ ). Adverse childhood experiences and rumination together explained 11% of the variance in avoidance (a relatively moderate effect size; see Cohen, 1988). Moving to indirect effects, rumination fully mediated the relationship between adverse childhood experiences and avoidance ( $\beta=0.08$ , 95% CI=0.057, 0.110). All findings are represented in Table 4; Fig. 2.

**Table 4** Unstandardized coefficients for the mediation model for Anxiety subdimension

Predictor	Outcome				Y (Avoidance)			
	M (Rumination)				Y (Avoidance)			
	Coeff.	SE	t	p	Coeff.	SE	t	p
X (ACE)	0.91	0.11	7.90	0.000	0.38	0.26	1.46	0.14
M (Rumination)	-	-	-	-	0.71	0.07	9.65	0.000
Constant	22.96	0.27	85.10	0.000	25.94	1.77	14.57	0.000
<i>Indirect effect of ACE on avoidance through rumination</i>								
	Coeff.	Boot SE	Boot LLCI 95%		Boot ULCI 95%			
	0.64	0.01	0.057		0.109			

SE Standard error, X Independent variable, M Mediator, Y Dependent variable, LL Lower level, UL Upper level. Bootstrapping method = 5000 resampling. ACE Adverse Childhood Experiences



**Fig. 2** Mediation model for avoidance with standardized estimates<sup>a</sup> (<sup>a</sup>Trauma: adverse childhood experience, anxiety: social anxiety disorder)

## Discussion

This study aimed to examine the mediating effect of rumination on the relationship between adverse childhood experiences and social anxiety disorder in adults. For this purpose, firstly, the relationship between adverse childhood experiences and social anxiety and rumination was examined; Subsequently, parallel multi-mediator analysis and serial mediator analyses were conducted.

According to the findings obtained from the correlation analysis, adverse childhood experiences were found to be positively associated with anxiety, avoidance, and rumination. There are many studies in the literature that support this conclusion. Similarly, Sokolowski et al. (2022) concluded that adverse experiences in childhood were associated with rumination. Based on this, it is possible to say that adverse childhood experiences affect both the way individuals think and their brain functions. Gündüz et al. (2019) found in their study with 275 university students that adverse childhood experiences caused mental dysfunctions that lead to rumination.

The findings of the study show that there is a significant and positive relationship between rumination and social anxiety disorder. Buckner et al. (2010) state that individuals with social anxiety disorder can focus their attention on threatening situations, develop ruminative thoughts about a social threat to themselves, and remember their past negative experiences. According to the limited number of studies in the literature investigating the relationship between social anxiety disorder and rumination, individuals with social anxiety disorder may experience severe difficulties in work, school, and social relationships. It can be thought that these difficulties lead to an increase in rumination levels by becoming more caught up in self-directed thoughts (Gültekin & Dereboy, 2011). Lyubomirsky and Nolen-Hoeksema (1995) state that individuals with ruminative tendencies often have problems in their social relationships. This may explain the positive relationship between social anxiety disorder and rumination. Additionally, Bugay and Erdur-Baker (2011) state that individuals prone to rumination focus more on the negative aspects of their lives and feel the effects of the negativities they experience more. Similar thinking styles may also apply to individuals with social anxiety disorder, and these individuals may constantly think about their negative social experiences, causing their rumination levels to increase.

Within the scope of the research, a relationship was found between adverse childhood experiences and social anxiety disorder, and it was concluded that rumination played a mediating role in this relationship. When the literature was examined, no study was found investigating the mediating role between the variables of the study. However, as a result

of their study with 571 university students, Binelli et al. (2012) found that students with high levels of social anxiety had more adverse experiences in childhood and that these experiences constitute a risk factor for social anxiety. This is because adverse experiences experienced in childhood may cause people to develop negative assumptions about themselves and their relationships with their social environment (Arslan et al., 2022). Tekin (2022) conducted his study with 590 young adults, investigating the mediating role of rumination in the relationship between adverse childhood experiences and cognitive dissociation, acceptance, and suppression. As a result of the research, it was found that rumination had a partial mediator role among the relevant variables.

## Limitations

Factors such as the fact that the study consisted of information obtained based on self-report and that it was studied on a non-clinical sample including only university students can be expressed as limitations of the study.

## Conclusion and recommendation

As a result of the study, it was found that there were positive and significant relationships between adverse childhood experiences, social anxiety disorder, and rumination. It was also concluded that it had a significant effect on adverse childhood experiences and social anxiety disorder, and that rumination had a mediating role in this effect. It has been observed that as the level of rumination increases, social anxiety disorder symptoms increase. Studies conducted on university students show that negative emotions can have negative effects on learning, and positive psychological reactions can increase the effectiveness of education (Kosov et al., 2023; Ramos-Galarza et al., 2023; Fanaja et al., 2023). For this reason, this study we conducted with university students gains extra importance. Based on the study results, students with intense adverse childhood experiences can be identified, especially in schools, and intervention programs can be prepared for these students. The quality of life of individuals can be improved by realizing that social anxiety disorder and rumination are phenomena that can be overcome. Since the study was conducted with university students, the effects of the participants' adverse childhood experiences are from a very short time ago. The generalizability of the findings can be increased by conducting similar studies with individuals in different age groups. In addition, more in-depth findings can be obtained by conducting qualitative studies, the nature of the relationships between the variables of the research can be analyzed, the

sources of the felt negativities can be identified and solutions can be developed to overcome them.

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**Data availability** Authors confirm that all data generated or analysed during this study are included in this published article. Furthermore, primary and secondary sources and data supporting the findings of this study were all publicly available at the time of submission.

## Declarations

**Conflict of interest** The authors state that the study was conducted without any potential conflict of interest.

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