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Risk Factors and Eating Disorders Among Spanish Adolescents: A Systematic Review

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ABSTRACT

Eating disorders (ED) have become a public health issue and they emerge during adolescence. Despite this situation, to our knowledge, there are no scientific systematic reviews of the risk factors associated with ED among Spanish adolescents. Therefore, the aim of this study is to explore the risk factors associated with ED among Spanish adolescents. Databases were *PubMed*, *Scopus*, *Dialnet*, and *Scielo*. Seventeen articles were included in the analysis after applying the eligibility criteria. Main results show that BMI (biological factor), psychological comorbidity (psychological factor), and the quality of family dynamics (family factor) are the key risk factors in previous literature. Furthermore, there is a noteworthy lack of studies addressed to evaluate sociocultural risk factors related to ED.

Factores de Riesgo Relacionados con los Trastornos de la Conducta Alimentaria en Adolescentes Españoles: una Revisión Sistemática

RESUMEN

Los trastornos de la conducta alimentaria (TCA) ya suponen un importante problema de salud pública y suelen aparecer durante el periodo de la adolescencia. Pese a ello, no se han encontrado revisiones sistemáticas en la literatura científica sobre los factores de riesgo asociados a estos trastornos en población española adolescente. Por tanto, el objetivo del presente estudio es conocer los factores de riesgo de los TCA en adolescentes españoles. Las fuentes de información utilizadas han sido *PubMed*, *Scopus*, *Dialnet* y *Scielo*. Tras aplicar los criterios de elegibilidad, 17 artículos científicos fueron incluidos para su posterior análisis. Los resultados principales indican que el IMC (factor biológico), la comorbilidad psicológica (factor psicológico) y la calidad de las dinámicas familiares (factor familiar) constituyen los principales factores de riesgo estudiados. Por otra parte, destaca la notoria carencia de estudios dirigidos a evaluar los factores de riesgo socioculturales ligados a los TCA.

Palabras clave

TCA
Factores de riesgo
Adolescentes
Revisión sistemática

Introduction

Eating disorders (hereinafter EDs) have been growing in relevance in social-healthcare due to their severity, complexity, and difficulty in determining a specific diagnosis and treatment (Frieiro et al., 2022), becoming a major public health problem in developed countries (Oliva et al., 2012; Trompeter et al., 2022). In Spain, research estimates that EDs are already the third most prevalent chronic illness among the adolescent population group (SEMG, 2018).

EDs are defined as severe mental disorders characterized by pathological attitudes and behaviors in relation to eating (APA, 2013). They have in common the over-valuation of the figure and weight, body dissatisfaction, and the permanent desire for thinness, which are present during all stages of the disease (APA, 2013). Four main entities stand out: anorexia nervosa (AN hereafter), bulimia nervosa (BN), eating disorders not otherwise specified (EDNOS), and binge eating disorder (BED).

Furthermore, EDs emerge to a large extent during adolescence or early adulthood (Trompeter et al., 2022). The average age of onset is in adolescence, since this stage is associated with numerous physical and psychological changes, and there is widespread body dissatisfaction among the adolescent population (Nelson et al., 2021).

These are disorders of multifactorial origin where genetic, biological, psychological, and sociocultural risk factors are involved (Frieiro et al., 2022; Mills et al., 2018; Murray et al., 2022a; Rojo et al., 2017). Regarding the biological factors, studies on genetics have concluded that the heritability of EDs is high (Rojo et al., 2017). Other studies point to EDs being partially elicited by a disconnection between inhibitory and reward control networks in the brain (Murray et al., 2022a) or by sex differences in the cerebral gray matter (Murray et al., 2022b). Also, in relation to biological mechanisms, it is worth noting the existence of numerous studies (Babio et al., 2009; Espinoza et al., 2010; Gutiérrez et al., 2015) that propose body mass index (BMI hereafter) as a predictor of EDs, taking into account its relationship with obesity. Thus, a high BMI is a risk factor for the occurrence of EDs (Espinoza et al., 2010).

Regarding psychological factors, some of the variables associated with increased vulnerability are excessive rigidity, need for control, perfectionism, feelings of inefficacy, inadequate emotional regulation, and low self-esteem (Frieiro et al., 2022; Holland et al., 2013; Jacobi et al., 2018; Trompeter et al., 2022). Furthermore, different authors (Bakalar et al., 2015) analyze the comorbidity between ED and other psychiatric disorders. They highlight a high percentage in the presence of anxiety disorders, impulse control disorders, and affective disorders such as depression, noting that these all have an onset prior to the development of ED.

Regarding family risk factors, the influence of the family on the development of ED has been studied from different perspectives (Jewell et al., 2016; Kluck, 2010; Mensi et al., 2022; Stillar et al., 2023). For example, previous studies claim that there is an increased risk of developing an ED in families in which negative parental attitudes towards food, weight, and the figure are predominant (Kluck, 2010), or even when parents themselves experience fear of being actively involved in their children's recovery process (Stillar et al., 2023).

Finally, in reference to sociocultural factors, the social context unquestionably influences the development of EDs (Amaya-Hernández et al., 2017), which is why they appear in a much higher proportion in societies where thinness is emphasized. In addition, the important influence of the media and social networks should be highlighted. According to Mills et al. (2018), frequent exposure to the internet and social networks results in increased body dissatisfaction, drive for thinness, and high body surveillance. Some research suggests that internalization of the thin ideal may mediate the relationship between exposures to images of ideal beauty prototypes and body dissatisfaction, resulting in an increased likelihood of developing symptoms of ED (Bair et al., 2012).

Therefore, given the relevance of EDs due to their expansion in the population, the psychological repercussions caused by their symptomatology, and the impact on the health of those who suffer from them, the need is justified to investigate in greater depth the role played by the risk factors associated with their development and maintenance. Moreover, considering that the incidence of EDs is occurring at increasingly younger ages, it is of vital importance to understand which factors are related to their onset (SEMG, 2018). In this way, and taking into account that early detection when dealing with ED, significantly increases the possibility of a favorable evolution and recovery (Trompeter et al., 2022), the need for further progress in the etiological understanding of ED is evident. Furthermore, it should be noted that in recent years no systematic review of the scientific literature on the risk factors related to ED in Spanish adolescents has been published in scientific databases.

Thus, the general aim of this article is to carry out a systematic review of the scientific literature on the risk factors related to the development of ED in Spanish adolescents. To this end, the following specific objectives are proposed: to identify the different types of factors involved in the development of ED in Spanish adolescents, to analyze the main results derived from the studies selected for the systematic review, and to elucidate the main psychological variables associated with these risk factors.

Method

Information Sources and Search Strategy

The present work consists of a systematic review of the scientific literature. To this end, the guidelines of the PRISMA method (Page et al., 2021) were followed.

The searches were carried out in April 2022, in the *PubMed*, *Scopus*, *Dialnet*, and *Scielo* databases. The combination of terms and operators used in *Dialnet* and *Scielo* was: (((*trastornos de la conducta alimentaria*) AND (*factores de riesgo*)) AND (*adolescentes*)) AND (*España*); while in *PubMed* and *Scopus* the search was performed in English: (((*eating disorders*) AND (*risk factors*)) AND (*teenagers*)) AND (*Spain*).

The results obtained in each of the databases were as follows: 143 results in *PubMed*, 24 in *Dialnet*, 4 in *Scopus*, and 3 in *Scielo*. Subsequently, the inclusion and exclusion criteria were defined, as detailed in *Table 1* below.

Selection and Data Collection Procedure

Two reviewers (LCR and MJ) independently selected the publications that matched the eligibility criteria. In case of disagreement, the selection or exclusion of the publication was specifically discussed between the two reviewers until a final agreement was reached.

The corresponding PRISMA Flow Diagram is shown in Figure 1.

Finally, 17 articles met the eligibility criteria and were chosen for the systematic review.

Results

The main characteristics of the articles included in the systematic review are presented below in Table 2.

Thus, the analysis of the results will be carried out by grouping the articles according to the risk factors to which they refer.

Biological Risk Factors

Firstly, regarding the association between BMI and an increased risk of developing an ED, the results of different research (Babio et

Table 1
Eligibility Criteria

Inclusion criteria	Exclusion criteria
Studies must be no more than 15 years old (2007-2022 inclusive), so that they are current.	Being more than 15 years old (published before 2007).
Scientific articles.	Books, book chapters, editorials, manuals, doctoral theses, or conferences.
Scientific articles whose research design is a cross-sectional, experimental, or quasi-experimental study.	Scientific articles whose research design is a systematic review or a case study.
The study sample must be adolescents residing in Spain.	The study sample is/includes adolescents residing abroad.
The sample must be adolescents, i.e., young people between the ages of 12 and 18 years (both inclusive). However, in the case of longitudinal studies, the first collection of information can be from the age of 10.5 years, and the last one up to the age of 18 years.	The sample is children under 12 years of age and young people over 18 years of age.
	The study sample is a specific population: athletes, elite athletes, celiac patients, diabetics.
The scientific article must be written in Spanish or English.	The scientific article is written in a language other than English or Spanish.

Figure 1
Below Shows the Corresponding PRISMA Flow Diagram

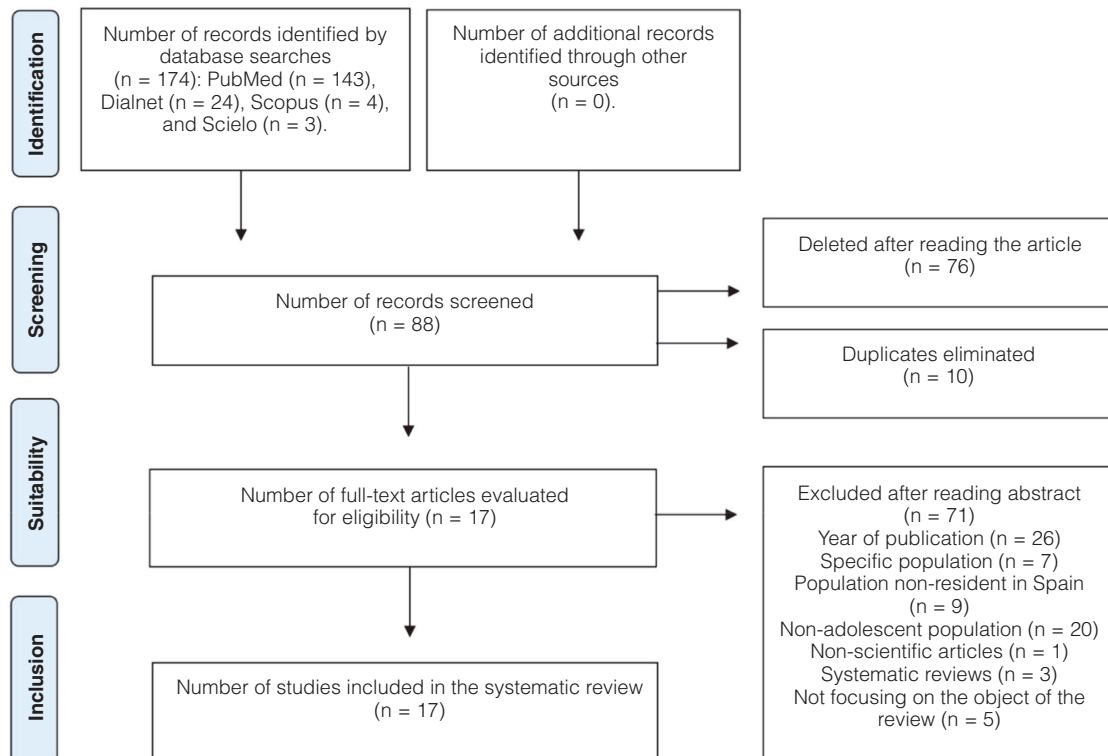


Table 2
 Characteristics of the Studies Selected for the Systematic Review

Author/s	Study design	Sample	Risk factor
Babio et al. (2009)	Cross-sectional descriptive study.	329 girls and 96 boys (aged 12-18 years) from an initial sample of 2,967 adolescents, from different schools in the province of Tarragona.	Bio; Psy; Soc
Beato-Fernández et al. (2007)	Longitudinal study. Follow-up: 13 years (T1) and 15 years (T2).	1,076 adolescents (576 girls and 500 boys) from different schools in the municipality of Ciudad Real.	Psy; Fam; Soc
Bisetto et al. (2012)	Ex post facto, retrospective study with non-probabilistic sample.	444 adolescents (265 girls and 179 boys) from different secondary schools in the Valencian Community, aged between 13 and 18 years old.	Psy
Cabaco et al. (2021)	Cross-sectional descriptive study.	647 adolescent students (361 girls and 286 boys) in 4th year of ESO [Spanish secondary education], from 16 different schools in the province of Salamanca.	Psy
Canals et al. (2009)	Longitudinal study. Follow-up: 11-13 years (T1) and 13-15 years (T2).	258 adolescents (130 girls and 128 boys) from different schools in the province of Tarragona.	Fam
Cortés-García et al. (2019)	Longitudinal study. Follow-up: 10-11 (T1), 12-13 (T2), 14-15 (T3), and 16-17 years (T4).	904 adolescents (447 girls and 457 boys) from different schools in the province of A Coruña.	Fam; Soc
Espinoza et al. (2010)	Longitudinal study. Follow-up and span of 28 months between evaluations.	128 girls from different schools in the province of Barcelona, between 12 and 14 years old (average age 13.5).	Bio; Psy; Soc
Ferreiro et al. (2011)	Longitudinal study. Follow-up: 12-13 (T1) and 14-15 years (T2).	828 adolescents (415 girls and 413 boys) from different schools in the province of A Coruña.	Psy
Ferreiro et al. (2014)	Longitudinal study. Follow-up: 10-11 (T1), 12-13 (T2), 14-15 (T3), and 16-17 years (T4).	942 adolescents (465 girls and 477 boys) from different schools in the province of A Coruña.	Psy
Frieiro et al. (2021)	Cross-sectional descriptive study.	790 adolescents (380 girls and 410 boys), ESO students from different schools in Galicia.	Fam
Gutiérrez et al. (2015)	Cross-sectional descriptive study.	448 adolescents (232 girls and 216 boys) students in the 2nd year of ESO (12-15 years old) from different Catalan schools.	Bio; Psy; Soc
Mas et al. (2013)	Cross-sectional descriptive study.	281 adolescents between 13 and 18 years of age.	Bio
Mora et al. (2022)	Cross-sectional descriptive study.	579 adolescents (260 girls and 319 boys) in lower secondary school (1st and 2nd ESO) from different schools in Madrid.	Psy; Soc
Pamies and Quiles (2012)	Cross-sectional descriptive study.	2,142 adolescents (1,130 girls and 1,012 boys), ESO students from different schools in the province of Alicante.	Psy
Plumed et al. (2019)	Longitudinal study. Follow-up and 2-year span between evaluations.	7,167 adolescents (3,751 girls and 3,416 boys) between 13 and 15 years of age.	Fam
Rojo et al. (2017)	Cross-sectional descriptive study.	584 pairs of twins aged 13 to 18 years in the Valencian Community.	Bio
Veses et al. (2011)	Cross-sectional descriptive study.	195 adolescents (97 girls and 98 boys) between 13 and 18 years of age.	Bio

Note. Bio = biological risk factors; Psy = psychological risk factors; Fam = family risk factors; Soc = sociocultural risk factors.

al., 2009; Gutiérrez et al., 2015; Espinoza et al., 2009; Veses et al., 2011) point to BMI as a significant predictor in the increased risk of developing an ED. Secondly, in reference to the heritability of EDs, the results of the research by Rojo et al. (2017) highlight that in all the variables studied, monozygotic twins present a higher correlation than dizygotic twins, indicating a possible heritability of the trait. Furthermore, the results of the research by Mas et al. (2013) show that patients with AN and those with obsessive compulsive disorder share some genetic markers.

Psychological Risk Factors

The study of psychological risk factors is the most relevant among the selected studies. Thus, 9 of the 17 articles selected refer to factors of this type in their results. Firstly, the results of Babio et al. (2009) show a statistically significant relationship between a greater probability of developing an ED and suffering from generalized anxiety disorder and dysthymia. Similarly, it is shown that adolescents with high scores in psychological distress and depressive symptoms are more likely to suffer from an ED (Beato-Fernández et al., 2007; Ferreiro et al., 2014). On another note, the

research by Ferreiro et al. (2011) has shown that body dissatisfaction is one of the most robust risk factors for the development of ED; in the same way, having problems with body image and extreme weight control behaviors are also found to be related (Espinoza et al., 2009). Additionally, in the research by Gutiérrez et al. (2015), the results show that adolescents who had a higher risk of having an ED had higher scores in perfectionism, body dissatisfaction, addictive behaviors, and lower scores in self-esteem. Conversely, according to the results of Mora et al. (2022), subjects with higher self-esteem have a lower risk of developing an eating pathology. Finally, Pamies and Quiles (2012) show that the risk of developing an ED is positively and significantly related to the coping styles of intropunitive avoidance and positive and hedonistic action.

Family Risk Factors

Regarding family risk factors, the results of the research by Beato-Fernández et al. (2007) show that, in boys, the presence of family dysfunction is related to abnormal eating behaviors 2 years later. In contrast, this trend is not observed in girls. Furthermore, Cortés-García et al. (2019) study the relationship between the risk

of developing an ED and the quality of attachment to parents. In both sexes, worse attachment towards the mother is related to more symptoms of ED, the influence being more pronounced in girls. On the other hand, the results of the research by Frieiro et al. (2021) show significant relationships between the risk of ED and the educational level of the family (primary and secondary studies) and the family relationship (families with a relationship that is "not very good"). Along the same lines, Canals et al. (2009) study the relationship between certain cognitive and behavioral dimensions of parents and their children's risk of developing ED. Thus, adolescents belonging to the risk group had parents who scored higher in drive for thinness and perfectionism. In addition, correlations were established between the parents' subscale scores and those of their children. Finally, one of the articles selected for review refers to teasing as a risk factor for abnormal eating behaviors. However, it is not specified that teasing is carried out by parents, so it could also be considered as a social risk factor. Thus, the results of the research by Plumed et al. (2019) show that weight-related teasing does not have a predictive effect on the risk of developing ED.

Socio-Cultural Risk Factors

Regarding sociocultural risk factors, among the selected articles, reference is made to variables related to cultural influences and peer relationships. First, regarding peer relationships, the results of the research by Beato-Fernández et al. (2007) and Cortés-García et al. (2019) show that, in boys, poor relationships with friends are a predictor for a higher risk of suffering from ED. However, this association is not seen in girls. Secondly, in relation to cultural influences, the research by Gutiérrez et al. (2015) shows that a higher internalization of the appearance standard is associated with higher scores in the risk of developing an ED. Furthermore, Babio et al. (2009) and Espinoza et al. (2010) include in their research the sociocultural influence of the thinness model on the risk of developing an ED, finding significant relationships between the two. Along the same lines, the results of the research by Mora et al. (2022) show a significant relationship between the risk of developing an ED and the use of new technologies and social networks.

Discussion

The aim of this article was to conduct a systematic review of the scientific literature on the risk factors related to the development of ED in Spanish adolescents.

In reference to the biological risk factors, one of the most studied variables is BMI. Current research affirms that BMI is a significant predictor of the development of ED (Gutiérrez et al., 2015). These data are consistent with the results of the present review, since all the included studies that analyze this relationship conclude that adolescents with a high BMI present a higher risk of developing an ED (Babio et al., 2009; Espinoza et al., 2010; Ferreiro et al., 2011; Gutiérrez et al., 2015; Veses et al., 2011). Another of the biological risk factors studied is the influence of genetics (Mas et al., 2013). The results of the aforementioned research are in agreement with the evidence of the current scientific literature on the heritability of EDs (Rojo et al., 2017).

Regarding the psychological risk factors, psychological comorbidity has been identified as a predictor of ED (Jacobi et al., 2018). The results of Ferreiro et al. (2014) show a significant relationship between the presence of depressive symptoms and the risk of ED. The results of the research by Babio et al. (2009) also show a significant relationship between the risk of suffering from ED and presenting symptoms of generalized anxiety disorders. Both relationships are consistent with recent research outside the Spanish setting (Jacobi et al., 2018). Regarding sex differences, some studies argue that the relationship between depressive symptoms and the risk of ED is essentially the same for boys and girls (Ferreiro et al., 2014), however, other studies point out that the presence of emotional disturbances are a female-specific predictor (Babio et al., 2009). On another note, research by Ferreiro et al. (2011), Espinoza et al. (2010), and Gutiérrez et al. (2015) relate an increased risk of ED to body dissatisfaction or negative body image. Similarly, another of the main psychological risk factors is low self-esteem. Thus, the results of the research included in the present systematic review (Mora et al., 2022; Gutiérrez et al., 2015) are consistent with other research published in the literature (Frieiro et al., 2022) in concluding that there is a significant association between low self-esteem and the risk of suffering from ED. Regarding the relationship between certain personality traits and the risk of ED, the results of the research by Gutiérrez et al. (2015) should be highlighted, where a significant association with perfectionism is reflected. This finding is consistent with what has been published in the scientific literature (Pamies & Quiles, 2014).

The scientific literature provides evidence that the family plays an important role in the risk of children and adolescents developing an ED (Mensi et al., 2022; Stillar et al., 2023). Thus, the results of the research by Canals et al. (2009) show that certain cognitive and behavioral dimensions of parents have a long-term influence on their children's risk of developing an ED. On the other hand, the results of the research by Frieiro et al. (2021) show that families in which the family relationship is rated as "not very good" have a higher risk of adolescents developing an ED. These data are consistent with the results of other research carried out in which it is concluded that, when the relationships and family dynamics are complex, and rigid or very strict dynamics occur, these may have an effect on the development of psychopathological symptoms in children/adolescents (Cerniglia et al., 2017). Along the same lines, a better attachment to the maternal figure predicts a lower risk of developing ED in both boys and girls (Cortés-García et al., 2019). These findings are consistent with the systematic review by Jewell et al. (2016), where they conclude that insecure attachment to the mother is consistent as a risk factor in the development of EDs in adolescence.

Regarding the sociocultural risk factors, several studies (Beato-Fernández et al., 2007; Cabaco et al., 2021; Cortés-García et al., 2019) show that socialization problems predict the risk of eating disorders. Thus, Amaya-Hernández et al. (2017) consider that this relationship may be mediated by the relevance that the peer group takes on during adolescence, constituting itself as referents of socially acceptable roles and behaviors. On the other hand, in reference to sociocultural influences, the results of the research included in the systematic review show significant relationships between the risk of developing an ED and the following factors: the consumption of social networks and media (Mora et al., 2022); the

influence of advertising and the aesthetic ideal of thinness (Babio et al., 2009; Espinoza et al., 2010); and the internalization of the standard of beauty (Gutiérrez et al., 2015).

The results obtained in this systematic review should be considered taking into account a series of limitations: firstly, the studies included refer to adolescents aged between 12 and 18 years living in Spain, so they cannot be extrapolated to other types of population. Similarly, only articles with a cross-sectional, experimental, and/or quasi-experimental research design were included, and studies published in Spanish or English. Consequently, research that did not meet these criteria was not taken into account. Likewise, the time limitation set in the eligibility criteria (2007-2022) involves a restriction in the comprehension of the subject studied, which transcends this time range and there is extensive scientific literature prior to the date established. Finally, no books, book chapters, editorials, manuals, doctoral theses, or conferences were taken into account. This decision directly affects the results of the systematic review, as it leaves a potentially relevant body of scientific literature out of the analysis.

Regarding the practical implications of the present systematic review, it is crucial to continue advancing in the study of risk factors and triggers of EDs (Nebot, 2017). Striegel-Moore and Bulik (2007) point out four reasons why it is essential to study risk factors in EDs: studying causal mechanisms helps us to understand why certain people develop an ED and others do not, which in turn helps to reduce stigma in patients; studies on risk factors are a very valuable source of information for the revision of current classification systems, which are based only on observed symptom and sign clusters; it allows us to improve the design and implementation of treatments; and it facilitates the identification of high-risk groups on which to perform preventive interventions, as well as to design the content of these interventions.

In short, the systematic review of the scientific literature suggests that EDs have a complex, multifactorial etiology, and we have not yet achieved a full understanding of them. So far multiple evidence suggests that there is a certain genetic predisposition as well as environmental variables that influence the risk of developing an ED. Thus, it can be specified that the risk of developing an ED is mediated by biological, psychological, family, and sociocultural risk variables, as reflected and supported by the results of the present systematic review. The paucity of research that focuses on sociocultural influences in relation to the risk of developing an ED is striking. Therefore, a possible future line of research would be to analyze in greater depth the relationship between current sociocultural influences (especially the use of social networks) and the risk of developing an ED in adolescence.

Conflict of Interest

The authors declare that they have no conflict of interest.

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