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# Clinical Implications of Social Anxiety Disorder (SAD) and its Detection Methods- A Systematic Review

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## ABSTRACT

**Background:** A common symptom of SAD is significant impairment in interpersonal relationships that can affect various aspects of life as well as daily functioning and lead to decreased quality of life. Individuals with high social anxiety will tend to withdraw from social environments.
**Purpose:** This can eventually lead to loneliness and depression. Therefore, early detection is needed to find a diagnosis early on and prevent the condition from worsening.
This review aims to determine the clinical picture in patients with SAD and to find out the instruments that /have been used for clinical enforcement in the field.
**Methods:** We conducted a comprehensive search for full-text articles comprising case reports, case-control studies, cohort studies, and cross-sectional studies published between January 1, 2013, and December 30, 2023. The search encompassed databases such as PubMed, ScienceDirect, SAGE, and Scopus. It's important to note that this review does not delve into other clinical conditions associated with Social Anxiety Disorder (SAD), such as anxiety and depression, as they have been addressed in separate discussions. Additionally, the identification of anxiety and depression is excluded from this review.
**Results:** Out of 78 articles that were screened, only 56 met the eligibility criteria to be selected for further review. The initial steps that need to be taken include 1) defining the research objectives; 2) establishing inclusion criteria; 3) developing a search strategy for data retrieval or study selection; 4) collecting data; 5) assessing the quality of studies; and 6) synthesizing the results. Risk of bias was performed using FEAT principles and reviewers' discussion. A total of 11 final articles that were reviewed showed a significant correlation between anxiety disorder and detection.
**Conclusion:** As individuals with SAD are large in number, based on this review, early detection is required using methods used by local health regions such as through interviews or clinical symptom assessment. This aims to find cases as quickly as possible and provide appropriate interventions.

**Keywords:** clinical, detection, social anxiety disorder

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## BACKGROUND

Social Anxiety Disorder (SAD) is a common and detrimental psychiatric disorder with a lifetime prevalence rate estimated at 12.1% (Shatz et al., 2024). A common symptom of SAD is significant impairment in interpersonal relationships that can affect various aspects of life as well as daily functioning and lead to decreased quality of life. During interactions, individuals with SAD report a lack of closeness, familiarity, and acceptance, and are more likely to be rejected by others compared to individuals without SAD (Asher, Maya; Aderka, 2020). People with SAD are also reported to be more likely to experience aggressive behaviors or traditionally conceptualized and understood as the context of external and personality pathology. They are also reported to experience higher levels of anxiety and tend to respond to stress with increased irritability, hostility, anger attacks, and aggression (Kuo et al., 2021).

Traditionally, aggressive behavior is usually conceptualized and understood in the context of externalizing pathology and personality. However, aggression can also be found in internalizing conditions such as social anxiety disorder. Patients with social anxiety disorder (SAD) reported significantly higher anger reactivity compared to a healthy control group (Breen & Kashdan, 2011).

Social anxiety disorder (SAD) is a common and chronic disorder that can cause significant functional impairment in a variety of contexts. Individuals with this disorder typically perceive themselves as flawed and inferior and fear that their/their flaws will be visible to others. Therefore, situations where others may judge or evaluate individuals with SAD are usually perceived as highly threatening and anxiety-provoking (Rozen & Aderka, 2023). The 12-month prevalence rate of SAD was found to be 6.8% (Kessler et al., 2005 in (Rozen & Aderka, 2023) and the disorder is usually chronic. SAD can significantly impair an individual's functioning in work, school, and relationship contexts (Asher, Maya; Aderka, 2020).

Based on this and the significant impact on the sufferer, several previous studies have attempted to find various ways or methods for clinical enforcement of SAD. Tschacher et al. (2014) used detection by looking at nonverbal alignment which is based on the relationship between individual movements during a particular interaction. This detection focuses on the number of movements, not the type of movement. In psychology in general, nonverbal alignment is associated with cooperative, communicative, and empathic social interactions. This suggests decreased negative symptoms in SAD and increased positive symptoms. In addition, some previous studies have used human observation to code the interpersonal behavior of individuals with SAD and approximate nonverbal congruence. Individuals with SAD tend to speak, nod, smile, and gesticulate their hands less compared to individuals without SAD. In addition, individuals with high social anxiety tend to speak less, respond to others' smiles to a lesser extent, and fidget more compared to individuals with low social anxiety. In addition, interaction partners of individuals with high social anxiety report that conversations are less coordinated and less enjoyable compared to interaction partners of individuals with low social anxiety (Wenzel et al., 2005) in Shatz et al. (2005) in Shatz et al., (2024).

Asher et al., 2020 recommend through recent research using objective assessment of nonverbal behavior by analysing videos using computer programs. In such an objective analysis, the video is analyzed by a computer program to measure the movements of each individual, and the movement vectors are then correlated to obtain a measure of alignment. Objective assessment has several advantages over human observers such as excellent reliability and the ability to detect even the most minor movements. In a recent examination

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of a clinical sample, objective assessment of nonverbal behavior was found to be more prevalent in individuals with social anxiety than through observation of human behavior.

**OBJECTIVE**

This review aims to investigate the implications of SAD and its clinical detection in sufferers of

**METHOD**

Search Method: The exploration involved a search utilizing the terms "social anxiety disorders " AND "implication”," as well as "SAD OR clinical OR detection." This was conducted to identify articles relevant to the research objectives, specifically focusing on people with SAD, what are the clinical symptoms, as well as symptom detection that can be used. Criteria for Selection: The sought-after research articles adhered to specific inclusion criteria for online publications, encompassing the following: studies within the past decade (2013-2023); inclusion of information regarding An article that discusses the clinical symptoms of SAD, symptom variations, and various methods to detect SADR; and the inclusion of empirical research, both qualitative and quantitative, related to social anxiety. Exclusion /criteria encompassed articles not in the English language and SAD symptoms that raise deeper concerns about anxiety and depression. Data Retrieval: A total of 79 articles, connected to symptoms linked with social anxiety, were obtained from electronic databases, with 20 articles subjected to analysis. These articles were compiled using observational research methods aligned with PRISMA guidelines (Preferred Reporting Items for Systematic Reviews and Meta-analyses). All identified articles were comprehensively meta-analyzed. The research stages involved selecting literature, thoroughly reviewing article content, determining relevance, extracting core themes and concepts, and synthesizing findings (refer to Figure 1, Flowchart of Study Protocol).

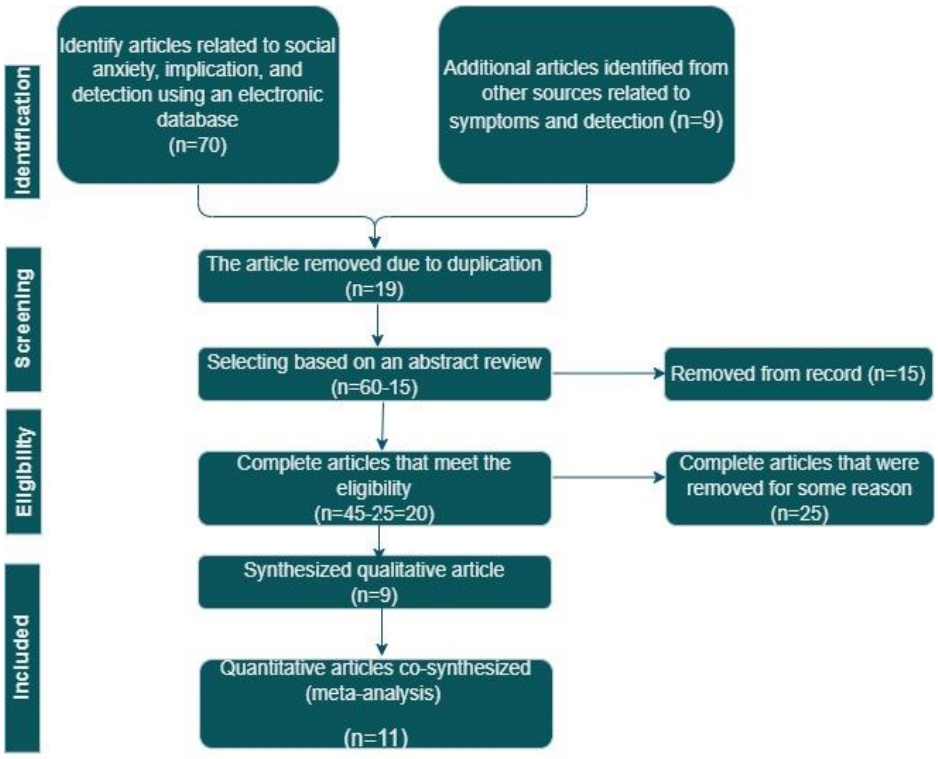


**Figure 1. Flowchart of study protocol**

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## RESULTS

Article searches were carried out by entering the keywords " social anxiety disorders " AND "implication"," as well as "SAD OR clinical OR detection". They obtained 79 relevant articles from 8 electronic databases Scopus (10), DOAJ (8), Elsevier (11), ProQuest ( 8), Web of Science (7), ScienceDirect (9), PubMed (12), and SAGE (14). Furthermore, articles were reviewed following guidelines such as the flowchart above, and 11 relevant articles were obtained. Table 1 shows the study characteristics of Clinical symptoms and detection in SAD.

Table 1. Study Characteristic (n=11).

| No | Author, year, & location | Objective | Methods | Findings |
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| 1 | (Shatz et al., 2024), unknown | Synchronizing symptoms experienced by SAD sufferers between interview and machine learning. | Design: quantitative comparison or comparing two groups<br>Population: 42 people with SAD who were interviewed (verbal data), and 42 people with SAD who were viewed for objective symptoms (non-verbal).<br>Instrument: the type of interview instrument is not mentioned but has content about the quality of social interaction, cooperation, communication, and empathy. Non-verbal data were video-recorded and analyzed using a computer program.<br>Outcome: comparison of the accuracy of symptom prediction by interview and by a computer programme. | The results showed that diagnosing individuals with Social Anxiety Disorder (SAD) through interviews had significantly lower levels of nonverbal alignment compared to interviews of individuals without SAD. In addition, interviews with individuals with SAD had a lower level of trustworthiness compared to interviews with individuals without SAD. |
| 2. | (Mallott et al., 2023), unknown | Examining factors that influence the connection between social anxiety and aggression can assist researchers and practitioners in anticipating the | Design: Cross-sectional<br>Population: 220 secondary school students<br>Instrument: assessed by the Brief Fear of Negative Evaluation-II (BFNE-II; Leary; 1983). | This study found that people with high levels of social anxiety tend to respond to stress with increased irritability, hostility, anger attacks, and aggression. |

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| | | likelihood of aggressive behavior in individuals dealing with social anxiety. | Outcome: knowing the symptoms and domineering factors of SAD | Furthermore, anger expression may be an important predictor of treatment outcomes in people with social anxiety disorder. In adolescence, social anxiety and panic attacks have been associated with an increased prevalence of intermittent emotional outburst disorder and higher levels of aggression. |
| 3. | (Breen & Kashdan, 2011), public Mid-Atlantic University | In this study, it aims to determine whether rejection is an antecedent of anger. And find out when individuals with high social anxiety suppress anger as a rejection response, and avoid unpleasant experiences (EA). | Design: Quantitative<br>Population: Participants consisted of 170 undergraduate students enrolled in an introductory psychology course at a reputable university.<br>Instrument: evaluated experiential avoidance (EA)<br>Outcome: discussed implications for understanding the relationship or interrelationship between social anxiety and anger. | Individuals experiencing high levels of social anxiety reported frequent and intense anger. The results of this study suggest that rejection is a strong source of anger for individuals with SAD. And as a response to suppress anger individuals with SAD avoid experiencing rejection. The results of this study also showed that individuals with low SAD had low anger compared to individuals with high SAD in response to rejection. |
| 4. | (Scheel et al., 2014), unknown | Knowing the difference in shame as an implication of SAD and depression | Design: Cross-sectional<br>Population: 290 community sample<br>Instrument: the SHAME questionnaire<br>Outcome: to determine the relationship between social anxiety | In this study, it was found that individuals with social anxiety are more likely to experience situational shame where one feels |

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| | | | and shame. | incompetent or socially ostracised, compared to existential shame. This state is characterized as a long-lasting emotional side or said to be like a trait. It was found that the relationship between shyness and social anxiety remained significant even after controlling for depression. |
| 5. | (Gutiérrez-García et al., 2018), Spanish | Knowing the role of different types of unhappy eyes. More specifically, we were interested in how different unhappy eye expressions (angry, fearful, surprised, and neutral). | Design: Quantitative<br>Population: 236 students in classrooms, aged 20-25 years.<br>Instrument: Social Phobia Scales (SPS; Mattick and Clarke, 1998)<br>Outcome: using eye movements, eyeballs, and interpreting smiles to compare low and high SAD groups.kelompok SAD rendah dan tinggi. | No differences in prototypical expressions were found in the eyes and mouth in the high and low SAD groups. Whereas the shape of the smile was different in the high SAD group, the smile was ambiguous compared to the low SAD group. In the observation of eye movements, the high SAD group tended to look to the left and seemed in a hurry to immediately look at the opponent. |
| 6. | (Chen et al., 2015), The Brain & Mind Research Institute | Determine the accuracy of detection through eye tracking when a person with SAD is exposed to a public presentation | Design: Comparisons, ANOVA<br>Population: 35 people divided into SAD group vs control group<br>Instrument: a visual scanning tool, which assesses an individual's gesture when performing in public | Socially anxious participants showed significantly longer visual scanning paths compared to the control group. Scanning in SAD found avoidance in maintaining attention to social |

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| | | | Outcome: gesture differences in the SAD group and the control group | stimuli throughout the speech, reduced total fixation time towards social display regions, and greater total fixation time in the remaining non-social regions of the audience display. |
| 7. | (Piccirillo & Rodebaugh, 2022), Midwestern University Community | Captures symptoms processes central to internalized distress, rather than SAD and major depressive disorder (MDD) specifically | Design: Examined the disparities in individual-level estimates between the ML-VAR and person-specific VAR models to assess the extent of differences, given prior research indicating potential variations in these estimates.<br>Population: 35 Cisgender women, Ages ranged from 18 to 37 years old<br>Instruments: Brief ecological momentary assessment surveys related to SAD-MDD comorbidity were administered five times a day for a month.<br>Outcome: looking at cognitive-affective factors, such as anxiety and loneliness, as well as maladaptive behaviors, such as avoiding social situations to predict depressed mood in the SAD group. | Cognitive-affective factors, such as anxiety and loneliness, and maladaptive behaviors, such as avoidance of social situations, will predict depressed mood in the SAD group. In addition, individual-specific patterns among these factors will emerge, which from one person to another will not show the same structure within the group. |
| 8. | (Borghese et al., 2022), the University Hospitals of Geneva. | Differences in anxiety in groups treated according to protocol or VR | Design: one group compared to the control group<br>Population: 46 subjects with SAD were randomly assigned to a | The protocol in this study where the groups were intervened using a presentation sound with a crowded |

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| | | | control or targeted memory reactivation (TMR) group.<br><br>Instruments: Anxiety levels were evaluated using both subjective measures (Subjective Units of Distress Scale) and objective measures (electrodermal activity and heart rate variability) at various stages of presentation preparation, including baseline (T1), after one night of sleep (T2), and after eight nights of sleep (T3). Finally assessed with the heart rate measurement (RMSSD).<br>Outcome: Differences in anxiety levels between groups, assessed by heart rate measurement (RMSSD), were observed during the last preparation phase (T3), with higher anxiety levels for the TMR group compared to the control group. | situation or VR, where this sound was strapped to the head during our 8-hour sleep led to higher anxiety in the TMR group. |
| 9. | (Albano et al., 2018), unknown | Findings on the viability, approval, and utilization of an innovative virtual reality (VR) system developed to improve the diagnostic accuracy of Social Anxiety Disorder (SAD) in young adults (YAs) through the | Desain: experimental design<br>Populasi: A clinical sample consisting of 42 young adults (18 females; average age 22.90 years, with an age range of 19–28 years).<br>Instrumen: completed a diagnostic interview, self-report questionnaires, 3 VR BATs, and a live role- | Accurate diagnosis using VR 19.2 innovation is hampered due to inaccurate reporting of symptoms, moreover, observational data does not exist. The feasibility and accuracy of using virtual reality (VR) to improve the diagnostic accuracy |

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| | | incorporation of contextually rich behavioral assessment tests (BATs). | play conversation at pretreatment.<br>Outcome: The virtual reality (VR) scenarios encompassed the following situations. | of SAD will be appropriate in children accompanied by contextually rich behavioral assessment tests (BAT) |
| 10. | (Basanovic et al., 2024), undergraduate psychology students at the University of Western Australia and University of Exeter | Found the relationship between social anxiety vulnerability and post-event negative thinking to be mediated by pre-event negative expectations that promote increased anxiety states in the face of the event. | Design: PATH models<br>Population:110 students<br>Instrument: The short form of the Spielberger State Anxiety Inventory (SAI-6; Marteau & Bekker, 1992)<br>Outcome: The current results have implications for clinical interventions aiming to reduce post-event negative thinking in individuals with a heightened vulnerability to social anxiety. | The results imply that the variation in pre-event negative expectancy associated with social anxiety may play a role in the development of post-event negative thinking after a social situation, influencing state anxiety. These findings underscore the potential interconnectedness between pre-event expectations, post-event cognition, and the influence on emotional states in individuals with social anxiety. |
| 11. | (Çek et al., 2016), University of Miami | This research investigated the connections between social anxiety, disgust-related attentional bias, and subjective emotional, physiological, and cognitive processing in the context of a social stressor. | Design: paired samples t-test<br>Population: 66 students<br>Instrument: Eye movements were tracked during the presentation of social stimuli (e.g., disgust faces) and used to calculate attention bias to disgust (AB-disgust)<br>Outcome: Explaining this relationship will shed light on social anxiety maintenance factors and may help identify changeable treatment targets. | Attention bias towards threats (e.g., face disgust) is a cognitive vulnerability factor to social anxiety that occurs in the early stages of information processing. Several studies have investigated the relationship between social anxiety and attention bias, in conjunction with emotional and cognitive responses to social stressors. |

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## DISCUSSION

Social Anxiety Disorder (SAD) is a severe mental illness that is believed to be caused, at least in part, by distorted information processing of socially relevant information. However, existing research has not investigated whether such distorted attentional processing occurs specifically in situations where individuals with SAD typically experience fear of social evaluation (Priasmoro & Lestari, 2023). Research by Asher et al., (2020) recently investigated nonverbal congruency codes using objective video assessments in Social Anxiety Disorder (SAD). Their findings indicated that nonverbal congruence between dyad members was significantly related to levels of social anxiety. The importance of social context also proved significant in moderating this relationship. Specifically, when interactions are less likely to require significant self-disclosure, such as in small-scale interactions, social anxiety has a positive relationship with nonverbal attunement. However, in interactions that are more intimate and require deeper self-expression, such as in intense interactions, social anxiety is negatively related to nonverbal attunement (Asher et al., 2020).

These findings have important implications for clinical interventions, indicating the need to consider the specific context when identifying and managing SAD symptoms. Meanwhile, research related to nonverbal harmony in the context of SAD treatment shows that nonverbal harmony can be an important factor in improving treatment outcomes, including more positive outcomes, better prognosis, and lower levels of hopelessness (Çek et al., 2016).

Therefore, understanding nonverbal congruence can be used as a guide in designing more effective intervention strategies. In the context of measuring nonverbal harmony, previous research tested three dimensions, namely: harmony in head movements, harmony in body, hand and upper thigh movements, and harmony in the head and body combined. However, these findings are not completely consistent and require other methods for the clinical detection of SAD (Rozen & Aderka, 2023).

Although previous research has examined nonverbal congruence in the context of SAD treatment and semi-structural social interactions, this study demonstrates the need to better understand how nonverbal congruence plays a role in the diagnostic interview. Interacting with a diagnosing clinician creates different social dynamics compared to formal social interactions and understanding the role of nonverbal attunement in this context can provide better insight into the processes underlying SAD (Arditte et al., 2016).

Another study also attempted to introduce an innovative approach to examine the visual and cognitive biases that occur in SAD during a given social stressor. In this experiment, individuals with clinically significant social anxiety and a control group were given the task of giving an impromptu speech in front of a pre-recorded audience. The audience sporadically shows movements of a social nature, both positive and threatening. Participants' attention to the audience's appearance was continuously monitored throughout the speech. The results showed that participants experiencing social anxiety when compared with the control group, showed significantly longer visual scanning patterns. In addition, individuals with social anxiety spend a relatively longer time focusing on non-social areas located between and around the audience. The findings of this study indicate that sufferers of Social Anxiety Disorder (SAD) have hyper scanning, which is characterized by excessive scanning patterns, as well as deliberate avoidance behavior toward social stimuli (Chen et al., 2015). This shows that SAD sufferers find it very difficult to focus when there is a social stimulus (D. P. Priasmoro et al., 2023).

In another method, namely using visual supervision, a treatment was given where participants who experienced clinical social anxiety and the control group were asked to

deliver a short impromptu speech in front of a pre-recorded audience, which occasionally showed social gestures, both positive and threatening. It was found that the clinical implications on the SAD group were more dominant than the control (Chen et al., 2015). Specific patterns in cognitive, affective symptoms, etc. in individuals in the SAD group also show non-uniform variations between individuals (Heimberg et al., 2014). Overall, previous research revealed that social anxiety can be identified through negative anticipatory behavior and visual scanning patterns using tools such as VR or computer programs. The finding of different outcomes may be an important indicator of the response to social stimuli in individuals with SAD (Donohue et al., 2021).

## CONCLUSION

The relationship between the implications of social anxiety and detection methods can be complex and can vary depending on the research context or measurement used. Detection methods can be used as a diagnostic tool to identify and measure the level of social anxiety in individuals. Accurate detection methods can provide important information in diagnosing and understanding the level of social anxiety. This can help design more effective interventions or clinical strategies. The integration of advanced technologies can expand detection and analysis capabilities, enabling more subtle identification of social anxiety. So it can improve the validity of the measurement results.

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## CONFLICTS OF INTEREST

The authors assert that there are no conceivable conflicts of interest in this study.

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