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Article

FEM-A Questionnaire: Assessment Tool for Level 1 Autism in Women

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Abstract

Inclusive education requires tools that are sensitive to neurocognitive diversity and capable of identifying profiles that have historically remained overlooked. In the case of autism, women are frequently underdiagnosed due to more subtle manifestations, social camouflaging strategies, and biases in traditional diagnostic instruments, which have been developed primarily based on male samples. This lack of detection limits access to appropriate educational support and hinders equitable intervention. In response to this need, the present study developed and validated a self-report questionnaire for the detection of Level 1 Autism Spectrum Disorder (ASD) in women over 16 years of age. A total of 47 items were initially created and later reduced to a 19-item unifactorial model after exploratory and confirmatory factor analyses. The model explained 68.2% of the variance and showed good fit indices (RMSEA = 0.061; CFI = 0.920; TLI = 0.905; SRMR = 0.047), as well as high internal consistency (α = 0.962), temporal stability (r = 0.948), and discriminative power (AUC = 0.961). This instrument can contribute to teacher training and the implementation of fairer educational practices by facilitating the identification of the female autism phenotype and promoting learning environments where all individuals can thrive.

Keywords: inclusion; education; level 1 autism spectrum disorder; women; female phenotype of ASD; questionnaire; assessment; self-administration; camouflage; adolescent; adults

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1. Introduction

Autism Spectrum Disorder (ASD) is a neurodevelopmental condition that affects multiple dimensions, including difficulties in social reciprocity, verbal and nonverbal communication, cognitive flexibility, and sensory processing (Alcalá & Ochoa Madrigal, 2022; García Murillo et al., 2020). The concept of "spectrum" refers to the variability in the expression and severity of traits, which means that each autistic person is unique and presents distinct characteristics that may vary depending on age, intellectual development, adaptive skills, and the support received (Palomo Seldas, 2017).

According to the DSM-5-TR (APA, 2022), ASD is defined by persistent deficits in communication and social interaction, as well as by restricted and repetitive patterns of behavior. Based on the level of support needed, three severity levels are distinguished: Level 1, which refers to individuals who "require support" to function in social settings and adapt to changes; Level 2, characterized by a need for "substantial support"; and Level 3, which requires "very substantial support" for carrying out daily activities (APA, 2022).

Additionally, an ASD diagnosis must specify whether other difficulties coexist, such as intellectual disability, language impairments, medical conditions, or environmental factors (APA, 2022; Martín del Valle et al., 2022).

In the case of women, the detection of ASD is more complex and is often underdiagnosed. Women with autism tend to develop better social skills, greater coordination between verbal and non-verbal communication, and display fewer stereotyped behaviors, which makes it easier for their difficulties to go unnoticed (Lai & Szatmari, 2020). Additionally, their restricted interests often align with typical gender patterns, further contributing to this invisibility. This bias stems from the fact that ASD diagnostic criteria have been developed primarily based on characteristics observed in males (Van Wijngaarden-Cremers et al., 2014; Green et al., 2019).

Another relevant aspect in the female population with ASD is the use of camouflaging strategies, through which they hide their social difficulties in order to adapt to their environment (Tubío-Fungueiriño et al., 2021), as girls and women learn from an early age to mimic neurotypical behavior patterns and conceal stereotypical behaviors (Hiller et al., 2016; Cook et al., 2021). This camouflaging is achieved by imitating social behaviors, memorizing conversational scripts, and adapting to social expectations, allowing them to fit into social situations at the cost of significant emotional strain (Hull et al., 2017; Livingston et al., 2019). Although these strategies facilitate social integration and it is effective in the short term, their continued use often leads to emotional fatigue, loss of identity, and low self-esteem (Cage & Troxell-Whitman, 2019; Chevallier et al., 2012; Hull et al., 2019). This phenomenon, more common in women, is linked to cultural expectations and gender roles that intensify social pressure to fit in and mask difficulties (Hull et al., 2020; Schuck et al., 2019), emphasizing the need to understand autism spectrum disorder through a biopsychosocial lens, rather than solely a behavioral one (Mandy & Lai, 2017).

The most commonly used diagnostic tools today, such as the ADOS-2 and the ADI-R, have limitations in detecting autism in women, especially in those without intellectual disability (Rynkiewicz et al., 2016). These limitations are explained by the fact that both instruments were primarily designed and validated based on male samples, reinforcing a sex bias in the observational criteria (Ratto et al., 2018; Tsirgiotis et al., 2024). As such, women without intellectual disabilities may camouflage their behaviors during the administration of these assessments, presenting performance that aligns with normative expectations, even though it does not reflect their true daily challenges (Hervás, 2022).

Self-report tests such as the Autism-Spectrum Quotient (AQ) (Baron-Cohen et al., 2001), the Ritvo Autism Asperger Diagnostic Scale-Revised (RAADS-R) (Ritvo et al., 2011), and the Autism Spectrum Screening Questionnaire-Revised Extended Version (ASSQ-REV) (Kopp & Gillberg, 2011) are used to assess autistic traits, but none of them are specifically designed to capture the particularities of the female phenotype, which contributes to delayed or inaccurate diagnoses in this population (Dworzynski et al., 2012). In fact, although the AQ has been widely employed as a screening tool in both clinical and research contexts, it has been repeatedly criticized for its limited sensitivity to gender differences and its emphasis on stereotypical male expressions of autism (Lai et al., 2015). Similarly, the RAADS-R was developed to improve the detection of adults with autism who had escaped diagnosis in childhood, but its items tend to prioritize overt behavioral patterns and may fail to adequately reflect the compensatory strategies and subtle social difficulties often reported by autistic women (Hull et al., 2020). The ASSQ-REV, originally designed for children and adolescents, has also been adapted for broader use; however, it was not constructed with the female phenotype in mind and therefore struggles to detect individuals who present with more nuanced or camouflaged manifestations of autism (Kopp & Gillberg, 2011; Rynkiewicz & Łucka, 2015). The recent literature has emphasized that

these limitations, common to traditional diagnostic instruments, are key factors underlying the underdiagnosis of autism in women and girls, highlighting the urgent need for measures that are sensitive to camouflaging behaviors, social adaptation, and less stereotypical profiles (Lai & Szatmari, 2020).

In recent years, several initiatives have aimed to adapt or create instruments that are more sensitive to the female phenotype, such as the female version of the Camouflaging Autistic Traits Questionnaire (CAT-Q; Hull et al., 2019) or proposed adapted scales in educational settings (Gray et al., 2021). However, the available empirical evidence indicates that we still lack sufficiently validated tools to accurately differentiate between social adaptation behaviors and manifestations of Autism Spectrum Disorder in women (Dean et al., 2017).

Given this reality, there is a need to develop a specific and sensitive tool that can accurately identify Level 1 autism in women over the age of 16. Therefore, the main objective of this study is the design and validation of a self-report questionnaire that considers the particularities of ASD in women and minimizes the existing diagnostic bias. To achieve this goal, the research process has been structured into several specific objectives.

The first objective is to identify the key characteristics of Level 1 autism in women through a comprehensive review of the scientific literature. Subsequently, the design of a questionnaire is proposed, integrating these dimensions to accurately reflect the social, communicative, sensory, behavioral, and executive difficulties observed in this population. Additionally, the validation of the questionnaire is planned through an evaluation by experts in autism and psychometrics, who will analyze the theoretical and technical relevance of the proposed items. Once the questionnaire is designed, its reliability will be assessed through a pilot study, using statistical metrics such as Cronbach's alpha and test-retest reliability to ensure its consistency and temporal stability.

Another objective proposed is the definition of cutoff scores and the analysis of the instrument's sensitivity and specificity, which will allow for the accurate identification of women with Level 1 autism and differentiation from those without a diagnosis. To achieve this, a validation study will be conducted with a large and representative sample.

It is important to highlight that the present research follows an exploratory and cross-sectional approach, with the primary aim of describing patterns, identifying emerging trends, and deepening the understanding of under-researched phenomena, rather than testing pre-existing theories. Given the exploratory nature of this study, which focuses on emerging and scarcely examined aspects of Level 1 autism—particularly in women—no a priori hypotheses were formulated, as doing so could have limited the identification of unexpected findings (Schwab & Held, 2020; Stebbins, 2001; Wang & Cheng, 2020). Instead, primary and specific research objectives were established to guide data analysis, allowing a flexible and open-ended exploration of the phenomenon, consistent with the inductive nature of this study.

Finally, the impact of the items on the detection of the female phenotype will be analyzed, identifying those with the highest discriminative capacity and optimizing their inclusion in the final tool. This approach will not only help bridge the existing diagnostic gap, but also generate knowledge applicable across various domains (clinical, educational, and social), contributing to a more inclusive and equitable understanding of autism in women (Critchley, 2019; Driver & Chester, 2021).

This questionnaire is proposed as a relevant contribution in the field of early and accurate detection of autism in women, addressing the need for more sensitive and specific diagnostic tools for this population. Moreover, its implementation could facilitate intervention and support tailored to the particular needs of women with Level 1 autism, promoting a fairer and more inclusive diagnosis.

On the other hand, the development of specific tools for detecting the female ASD phenotype has a crucial impact in the educational field. Early and accurate identification of neurodivergent profiles fosters more inclusive school environments where cognitive and social differences are recognized and valued. This is essential for designing tailored educational interventions and supports that meet the particular needs of each student, promoting equitable and respectful education of diversity. Teacher training plays a key role in this process, as professionals who are aware of and skilled in neurodiversity can implement more effective and empathetic pedagogical practices (Hart et al., 2020).

2. Materials and Methods

To carry out this research, a cross-sectional and exploratory study was designed, with the specific aim of developing and validating a psychometric self-report instrument for the detection of Level 1 autism in women. The Data Protection Unit of the University of Zaragoza authorized the processing of personal data on 26 April 2023, in accordance with Regulation (EU) 2016/679, General Data Protection Regulation (GDPR), and Organic Law 3/2018 on the Protection of Personal Data and Guarantee of Digital Rights (LOPDyGDD). Additionally, on 17 May 2023 (Record No. 10/2023), the Research Ethics Committee of the Autonomous Community of Aragon (CEICA) issued a favorable opinion (C.I. PI23/225) for the execution of this study, ensuring compliance with ethical principles in the collection and processing of data.

The research began with an exhaustive literature review on autism, with a particular focus on its manifestation in females, and searches were conducted in databases such as Elsevier, ResearchGate, PubMed, Sage Journals, and Web of Science, among others. This search made it possible to identify and categorize the factors that contribute to the underdiagnosis of ASD in women. To strengthen the theoretical basis, recent studies were reviewed, including evidence on sex differences in autistic traits (Lai & Szatmari, 2020; Hull et al., 2020; Rynkiewicz et al., 2016; Tubío-Fungueiriño et al., 2021), as well as the limited sensitivity of traditional instruments such as ADOS-2 and ADI-R for detecting autism in women without intellectual disability. In this process, diagnostic instruments such as the Autism-Spectrum Quotient (AQ) (Baron-Cohen et al., 2001), the Ritvo Autism Asperger Diagnostic Scale-Revised (RAADS-R) (Ritvo et al., 2011), and the Autism Spectrum Screening Questionnaire-Revised Extended Version (ASSQ-REV) (Kopp & Gillberg, 2011) were reviewed and analyzed. These tools, designed for self-administration in adults, are considered complementary to ASD diagnosis, although they were developed prior to the update of the DSM-5 diagnostic criteria (APA, 2013). Despite not being specifically oriented toward the female phenotype, significant items for assessing autism in women were identified within them.

Although these instruments were not originally designed to capture female-specific manifestations of autism, a detailed examination of their items allowed the identification of traits particularly relevant for women with Level 1 autism. For instance, in the Autism-Spectrum Quotient (AQ) (Baron-Cohen et al., 2001), items related to social reciprocity, subtle communication difficulties, and adaptation to social norms were scrutinized. Specific examples include questions on attention to social detail, the use of social scripts, and preferences in social interaction, which can reveal the presence of compensatory strategies often used by women to mask autistic traits.

The RAADS-R (Ritvo et al., 2011) was analyzed with special attention to items assessing sensory-motor skills, language patterns, and restricted interests, as these areas can manifest differently in women. For example, items exploring the use of socially learned phrases, imitation of peers' behavior, or nuanced interests that align with culturally expected female hobbies were considered particularly informative. Although initially developed for

broader adult populations, these items provided insight into subtle behavioral patterns that standard diagnostic tools may miss in women without intellectual disability.

The ASSQ-REV (Kopp & Gillberg, 2011), which includes the ASSQ-GIRL extension, was especially useful because it explicitly addresses traits more frequently observed in girls, such as social camouflage, nuanced difficulties in peer relationships, and adaptive coping strategies. For example, items referring to avoidance of social demands, acting out different roles, or having difficulties establishing close friendships were highlighted as relevant for the female phenotype.

By systematically reviewing and synthesizing these questionnaires alongside the recent literature on sex differences and diagnostic sensitivity, items were selected and adapted to construct a self-report instrument capable of detecting social, communicative, behavioral, sensory, and executive features of Level 1 autism in women. This process ensured that the final tool captures both overt and subtle manifestations, including strategies of camouflaging, thus increasing its sensitivity and relevance for identifying previously undiagnosed cases in the female population.

From this review, a series of 47 items were developed and submitted to an external expert validation process. Four external experts participated: one specialist in autism, giftedness, and twice-exceptionality; two specialists in giftedness and twice-exceptionality; and one psychometrics expert. The experts not only assessed the comprehension and language of the items, but also evaluated their theoretical and technical quality to ensure they were representative, relevant, diverse, clear, and accessible, in line with the guidelines proposed by Muñiz and Fonseca-Pedrero (2019). According to these authors, items should be heterogeneous to capture the full scope of the construct, clear and concise to avoid technical jargon, negations, or overly complex formulations, and easily understandable by the target population, using inclusive and non-discriminatory language. External reviewers conducted a content evaluation following inter-rater criteria (Cava & Buelga, 2018). Confidentiality was maintained, and reviewers did not have access to each other's assessments. Communication occurred asynchronously, and each reviewer had up to two months to provide feedback. To ensure precision and objectivity, experts rated the items in terms of clarity for the intended population, relevance for assessing the targeted constructs, and representativeness (Muñiz & Fonseca-Pedrero, 2019).

The items were organized into five key dimensions informed by the literature review as well as the framework of existing instruments (AQ, RAADS-R, ASSQ-REV): social difficulties, communication difficulties, repetitive or restrictive behaviors, sensory sensitivity, and executive skills. Additionally, a transversal dimension was included that explored self-awareness in different areas, with the purpose of analyzing how self-consciousness influences the expression of autism and vice versa. Expert reviews and internal analyses allowed for adjustments to the questionnaire through the elimination, modification, or addition of items, ultimately resulting in a total of 47 items distributed as follows: 11 in social difficulties, 9 in communication difficulties, 9 in repetitive or restrictive behaviors, 11 in sensory sensitivity, and 7 in executive skills. Responses were organized on a five-option Likert-type scale, including two negative, one neutral, and two positive options. Table 1 below presents the list of items distributed by dimensions.

Following the development of the questionnaire, a pilot test was conducted to evaluate its validity and reliability. The sampling method used was non-probabilistic, employing a snowball technique. As this sampling strategy relies on voluntary participation through online networks, potential self-selection bias must be acknowledged, which may limit the generalizability of the findings. A total of 215 women over 16 years old participated, of whom 108 had an official ASD diagnosis and 107 did not. Inclusion criteria were: being female, over 16 years old, having adequate Spanish proficiency, possessing an official ASD

diagnosis (for the experimental group) or not having one (for the control group), and the ability to complete the questionnaire independently. The lower age limit of 16 years was established because this corresponds to a period in adolescence when individuals already have the autonomy and cognitive maturity to complete a self-report tool independently. It also aligns with the educational context in which support needs often become more evident and diagnosis delays more critical.

Table 1. Initial questionnaire items.

Dimension	Item
Social Difficulties	1. It's hard for me to understand social cues in situations with people (e.g., expressions, body language, tones of voice, personal space or boundaries. . .). 2. I avoid demands of any kind. 3. I find it difficult to talk to people I don't know well. 4. I have difficulty understanding double meanings, irony, sarcasm, and metaphors. 5. It's hard for me to recognize my emotions easily. 6. I am able to understand my emotions. 7. I understand the emotions of others. 8. I feel nervous or anxious at meetings or parties. 9. I know how to react appropriately to the emotions of others. 10. It's hard for me to put myself in other people's shoes (feelings). 11. I feel tired after a social interaction like a meeting, a party, a birthday, a work dinner, etc.
Communication Difficulties	12. I feel uncomfortable maintaining eye contact when talking to someone. 13. I feel uncomfortable maintaining eye contact depending on what I perceive from each person. 14. It takes effort for me to understand the gestures and facial expressions of the people I'm talking to. 15. I worry about saying something strange or inappropriate in a conversation. 16. I imitate body language observed in series, books, or movies. 17. I imitate verbal language observed in series, books, or movies. 18. I feel comfortable adapting my way of speaking depending on the person I'm talking to. 19. When I interact with two or more people, it's hard for me to know when to speak or be silent. 20. It's hard for me to start a conversation or keep it going.
Repetitive or Restrictive Behaviors	21. I engage intensely with certain interests or activities. 22. It's very important to me to follow a routine. 23. It's very important to me to have consistent schedules. 24. I make repetitive movements or have repetitive behaviors (e.g., rocking or fiddling with my fingers). 25. I tend to put my hands under my legs or just curl them up. 26. Certain sensory stimuli bother me (e.g., strange noises or textures). 27. Certain visual stimuli bother me (e.g., bright lights). 28. Certain tactile stimuli bother me (e.g., certain textures). 29. I feel anxious when something or someone interferes with my plans or routines.
Sensory Sensitivity	30. I feel bothered by things like bright lights, sounds, smells, or textures. 31. I feel comfortable in noisy or crowded places. 32. I feel I need to avoid certain sensory stimuli to feel good. 33. I feel I need to seek certain sensory stimuli to feel good. 34. I have uncontrolled emotional reactions when I am overstimulated (e.g., yelling or crying). 35. It is important to me that things in my environment are stable. 36. I need more intense stimuli to perceive them correctly. 37. I perceive higher intensity stimuli correctly. 38. I prefer bright lights. 39. I prefer less bulky objects. 40. I am sensitive to physical pain.

Table 1. *Cont.*

Dimension	Item
Executive Skills	41. I find it difficult to plan and organize my day-to-day life. 42. I am flexible when facing changes in my daily routine. 43. I can prioritize tasks easily in complicated situations. 44. I can make decisions easily in complicated situations. 45. I try to avoid any type of demand in my day-to-day life. 46. I have difficulty keeping my tasks under control. 47. I feel comfortable doing several things at once or switching between different tasks.

Participant ages ranged from 16 to 63 years old (M = 36.85; SD = 11.34), and they came from various countries, including Spain, Argentina, Chile, and Mexico, among others. Table 2 below presents the sociodemographic characteristics.

Table 2. Participants and characteristics.

	ASD ***n* = 108**	**N-ASD** ***n* = 107**
Age	M = 34.72; SD = 8.04	M = 38.99; SD = 13.60
Female sex	108 (100%)	107 (100%)
Gender		
Female	100 (92.59%)	106 (99.07%)
Non-binary	5 (4.63%)	1 (0.93%)
Fluid	1 (0.93%)	-
Male	1 (0.93%)	-
Prefer not to say	1 (0.93%)	-
Country of residence		
Spain	48 (44.44%)	97 (90.65%)
Argentina	19 (17.59%)	6 (5.61%)
Chile	16 (14.81%)	1 (0.93%)
Mexico	11 (10.19%)	-
Uruguay	5 (4.63%)	-
El Salvador	2 (1.85%)	-
Ecuador	2 (1.85%)	-
Peru	1 (0.93%)	2 (1.87%)
Colombia	1 (0.93%)	-
Guatemala	1 (0.93%)	-
Ireland	1 (0.93%)	-
United Kingdom	-	1 (0.93%)
Other	1 (0.93%)	-

Note. ASD: autistic participants; N-ASD: non-autistic participants; M: mean; SD: standard deviation.

The data collection procedure was carried out using an online questionnaire accessible via Google Forms. Participants were contacted through social media, support groups, and online communities. The anonymous questionnaire included prior informed consent, sociodemographic information, and the main questionnaire. Completing the instrument took between 5 and 10 min.

As for the instruments, the questionnaire developed with the 47 items was used, distributed across the five dimensions mentioned and an additional section on transversality, focused on self-awareness in different areas. This final section allowed for the exploration of how self-consciousness influences the development of ASD in women.

3. Results

The statistical analysis of the data obtained in this study was performed using IBM SPSS Statistics, version 25, complemented with the Amos 23.0.0 module (IBM Corp, Armonk, NY, USA). This allowed for rigorous and precise execution of both exploratory (EFA) and confirmatory (CFA) factor analyses. The questionnaire was designed based on an exhaustive literature review, which helped identify the specific characteristics of the female phenotype in Level 1 Autism Spectrum Disorder (ASD). In its initial phase, a total of 47 items were developed, distributed across five theoretical dimensions: social difficulties, communication difficulties, repetitive behaviors, sensory sensitivity, and executive skills.

To validate the content of the items, an expert judgment was conducted, yielding a consensus greater than 80% for all retained indicators. Subsequently, an exploratory factor analysis (EFA) was performed on the total sample of 215 participants, aiming to identify the underlying structure of the items. During this process, 28 items that did not meet the established criteria were eliminated. Table 3 presents the excluded items along with the reasons for their elimination, which include: communalities below 0.50, specific component loadings below 0.40, and a Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy less than 0.50. The KMO measure of sampling adequacy yielded a value of 0.94, while Bartlett's test of sphericity was significant ($p < 0.001$), confirming the suitability of the data for factor analysis.

Table 3. Items excluded from principal component analyses.

Dimension		Items	Reason for Exclusion
Social Difficulties	1.	I avoid demands of any kind.	2
	2.	I am able to understand my emotions.	2
	3.	I understand the emotions of others.	1, 2, 3
	4.	I know how to react appropriately to the emotions of others.	2
	5.	It's hard for me to put myself in other people's shoes (feelings).	1, 2, 3
Communication Difficulties	6.	I feel uncomfortable maintaining eye contact when talking to someone.	2
	7.	I feel uncomfortable maintaining eye contact depending on what I perceive from each person.	2
	8.	I imitate body language observed in series, books, or movies.	2
	9.	I imitate verbal language observed in series, books, or movies.	2
	10.	I feel comfortable adapting my way of speaking depending on the person I'm talking to.	1, 2, 3
Repetitive or Restrictive Behaviors	11.	I engage intensely with certain interests or activities.	2
	12.	It's very important to me to follow a routine.	2
	13.	It's very important to me to have consistent schedules.	2
Sensory Sensitivity	14.	I feel comfortable in noisy or crowded places.	1, 2, 3
	15.	I feel I need to seek certain sensory stimuli to feel good.	2
	16.	It is important to me that things in my environment are stable.	2
	17.	I need more intense stimuli to perceive them correctly.	2
	18.	I perceive higher intensity stimuli correctly.	1, 2, 3
	19.	I prefer bright lights.	1, 2, 3
	20.	I prefer less bulky objects.	1, 2, 3
	21.	I am sensitive to physical pain.	1, 2, 3

Table 3. *Cont.*

Dimension	Items	Reason for Exclusion
Executive Skills	22. I find it difficult to plan and organize my day-to-day life.	1
	23. I am flexible when facing changes in my daily routine.	1
	24. I can prioritize tasks easily in complicated situations.	1
	25. I can make decisions easily in complicated situations.	1
	26. I try to avoid any type of demand in my day-to-day life.	1
	27. I have difficulty keeping my tasks under control.	1
	28. I feel comfortable doing several things at once or switching between different tasks.	1

Note: 1: communalities < 0.50; 2: specific component loading < 0.40; 3: KMO < 0.50.

The initial extraction suggested the existence of four factors explaining 31.58% of the total variance. However, confirmatory factor analysis (CFA) indicated that neither the four-factor nor the five-factor model achieved adequate fit indices. They showed high values in the root mean square error of approximation (RMSEA) and standardized root mean square residual (SRMR), along with a comparative fit index (CFI) that was only marginally acceptable. Consequently, a unifactorial model was chosen, which explained 68.2% of the variance and demonstrated excellent parsimony and psychometric consistency. This model ultimately comprised 19 final items, presented in Table 4 (English and Spanish version).

Table 4. Final questionnaire items with a unifactorial model.

1.	Me cuesta entender las señales sociales en situaciones con gente (por ejemplo: expresiones, lenguaje corporal, tonos de voz, espacio o límites personales. . .). It's hard for me to understand social cues in situations with people (e.g., expressions, body language, tones of voice, personal space or boundaries. . .).
2.	Me resulta complicado hablar con personas que no conozco bien. I find it difficult to talk to people I don't know well.
3.	Tengo dificultades para entender los dobles sentidos, la ironía, el sarcasmo y las metáforas. I have difficulty understanding double meanings, irony, sarcasm, and metaphors.
4.	Me cuesta reconocer mis emociones fácilmente. It's hard for me to recognize my emotions easily.
5.	Me siento nervioso/a o ansioso/a en reuniones o fiestas. I feel nervous or anxious at meetings or parties.
6.	Me siento cansado/a tras una interacción social como una reunión, una fiesta, un cumpleaños, una cena de trabajo, etc. I feel tired after a social interaction like a meeting, a party, a birthday, a work dinner, etc.
7.	Me cuesta esfuerzo entender los gestos y las expresiones faciales de las personas con las que mantengo una conversación. It takes effort for me to understand the gestures and facial expressions of the people I'm talking to.
8.	Me preocupa decir algo extraño o inapropiado en una conversación. I worry about saying something strange or inappropriate in a conversation.
9.	Cuando interactúo con dos o más personas me cuesta saber cuándo tengo que hablar o callar. When I interact with two or more people, it's hard for me to know when to speak or be silent.
10.	Me cuesta iniciar una conversación o mantenerla en marcha.

Table 4. *Cont.*

	It's hard for me to start a conversation or keep it going.
11.	Hago movimientos o tengo comportamientos repetitivos (por ejemplo: balancearme o tocar mis dedos). I make repetitive movements or have repetitive behaviors (e.g., rocking or fiddling with my fingers).
12.	Suelo meter mis manos bajo las piernas o simplemente las enrollo. I tend to put my hands under my legs or simply curl them up.
13.	Me molestan ciertos estímulos sensoriales (por ejemplo: ruidos o texturas extrañas). Certain sensory stimuli bother me (e.g., strange noises or textures).
14.	Me molestan ciertos estímulos visuales (por ejemplo: luces brillantes). Certain visual stimuli bother me (e.g., bright lights).
15.	Me molestan ciertos estímulos táctiles (por ejemplo: ciertas texturas). Certain tactile stimuli bother me (e.g., certain textures).
16.	Me siento ansioso/a cuando algo o alguien interfiere en mis planes o rutinas. I feel anxious when something or someone interferes with my plans or routines.
17.	Me siento molesto/a por cosas como luces brillantes, sonidos, olores o texturas. I feel bothered by things like bright lights, sounds, smells, or textures.
18.	Siento que necesito evitar ciertos estímulos sensoriales para sentirme bien. I feel I need to avoid certain sensory stimuli to feel good.
19.	Tengo reacciones emocionales descontroladas cuando estoy sobreestimulado/a (por ejemplo: gritos o llantos). I have uncontrolled emotional reactions when I am overstimulated (e.g., yelling or crying).

4. Discussion

The relevance of early and accurate identification of neurodivergent profiles extends beyond clinical settings and holds critical importance in education and inclusion. Recognizing the female ASD phenotype with sensitivity promotes inclusive learning environments where cognitive and social diversity are acknowledged and supported. This foundation is vital for developing tailored educational interventions and ensuring equitable opportunities for all students. Furthermore, training educators in neurodiversity enhances the implementation of empathetic and effective teaching strategies that respond to the specific needs of autistic women (Hart et al., 2020).

Therefore, the present study aimed to develop and validate a self-administered questionnaire for the detection of Level 1 autism in individuals over 16 years of age, with a particular focus on the female phenotype of ASD. The results obtained in the different analysis phases demonstrate that the instrument possesses optimal psychometric properties.

From a theoretical perspective, ASD is understood as a heterogeneous condition that manifests across a broad spectrum of symptoms and severity (Alcalá & Ochoa Madrigal, 2022; Palomo Seldas, 2017). This diversity has been particularly relevant in the female phenotype, where autistic characteristics tend to present more subtly or are masked, making detection difficult with traditional tools (Green et al., 2019; Lai & Szatmari, 2020).

The initial exploratory factor analysis suggested the existence of several dimensions, consistent with the clinical complexity described in the literature (García Murillo et al., 2020). However, the confirmatory analyses performed supported a unifactorial model, which explained 68.2% of the total variance and showed adequate fit indices (RMSEA = 0.061, CFI = 0.920, TLI = 0.905, and SRMR = 0.047). These results are consistent with the perspective that social difficulties, atypical communication, cognitive rigidity, and sensory hypersensitivity can be integrated into a continuum of autistic phenotypic expression, especially in women (Hull et al., 2017; Hervás, 2022).

Furthermore, the high internal reliability and excellent temporal stability reinforce the instrument's utility for application in both clinical screening and research contexts. The sensitivity and specificity observed in the ROC curve analysis, with an area under the curve of 0.961, indicate that the questionnaire effectively discriminates between individuals with and without an ASD diagnosis. This is an essential aspect, given the frequent overlap with other psychiatric conditions in autistic women (Espinosa et al., 2018; Young et al., 2018).

The fact that the questionnaire showed good results with a single-factor structure reinforces the idea that, although the female phenotype of ASD can manifest in diverse areas, there is a common underlying basis for the difficulties these women face, often masked by the use of social camouflaging strategies (Livingston et al., 2019; Tubío-Fungueiriño et al., 2021).

In addition, the present studies highlighted the importance of including dimensions such as sensory processing, executive functioning, and self-awareness, which are frequently underrepresented in existing self-report instruments like the AQ, RAADS-R, and ASSQ-REV (Baron-Cohen et al., 2001; Kopp & Gillberg, 2011; Ritvo et al., 2011). By systematically integrating these dimensions, the new questionnaire not only captures the core social and communicative difficulties, but also assesses the subtle strategies women use to navigate social contexts, including camouflaging and compensatory behaviors.

Moreover, the inclusion of items that consider self-reflection and awareness allows for a better understanding of how individuals perceive and manage their autistic traits in daily life. This provides insight into the psychological impact of camouflaging, such as emotional fatigue and challenges to self-esteem, which were observed in both studies and are consistent with the previous literature (Hervás, 2022; Hull et al., 2017).

Finally, the development process of the questionnaire emphasized expert review and careful item selection to ensure both clarity and relevance for the female population. This methodological rigor strengthens the tool's validity and offers a framework for future adaptations or translations, as well as potential applications in diverse cultural and clinical contexts.

5. Conclusions

In conclusion, the significance of this questionnaire is not limited to clinical applications; it also provides valuable support for inclusive education. Early recognition of the specific characteristics of autistic women enables educators to design and implement interventions that respect neurodiversity and foster equitable learning environments, thereby advancing educational inclusion (Hart et al., 2020).

The results obtained allow us to state that the questionnaire developed is a valid and reliable tool for the self-detection of Level 1 ASD in adolescent and adult women. Its application can contribute to reducing underdiagnosis rates in this population, complementing information obtained through traditional clinical instruments that are less sensitive to the female phenotype (Rynkiewicz et al., 2016; Van Wijngaarden-Cremers et al., 2014). In addition, although FEM-A was designed to address the female phenotype, it can also be administered to men. Its main novelty compared to prior instruments such as the AQ or RAADS-R lies in the explicit inclusion of items sensitive to camouflaging, sensory processing, and self-awareness, which reduce male bias and broaden its discriminative validity.

The integration of expert input and the selection of items from both prior instruments and newly developed content ensures that the questionnaire reflects both established diagnostic criteria and female-specific manifestations of ASD. By including dimensions such as social interaction, communication, repetitive behaviors, sensory sensitivity, executive functioning, and self-awareness, the tool captures a comprehensive profile that extends beyond the limitations of prior self-report measures.

Furthermore, the inclusion of a self-awareness dimension represents a methodological and conceptual advance, highlighting the interplay between personal insight, coping strategies, and social adaptation in autistic women. This approach not only enhances detection, but also provides valuable information for clinical and educational interventions, enabling more individualized and effective support.

Limitations of the present study include the relatively small sample size and its focus on Spanish-speaking women. Further validation is required in more diverse cultural contexts, with larger and more heterogeneous samples, and across genders. Another limitation is that, although camouflaging items were included, the instrument does not fully capture the dynamic and situational nature of masking behaviors.

Future lines of research could focus on replicating these findings in clinical samples, analyzing their applicability in other cultural contexts, and comparing the questionnaire's results with diagnoses obtained through structured interviews or instruments like the ADOS-2 and ADI-R, taking into account previously described sex-based sensitivity differences (Dworzynski et al., 2012; Hervás, 2022). Additionally, future studies could examine the instrument's sensitivity across diverse gender identities and age ranges, as well as explore how factors such as camouflaging strategies and self-awareness impact mental health, social adaptation, and long-term outcomes in autistic women. Longitudinal research could provide insight into how these coping mechanisms develop over time and influence both personal well-being and social functioning, enhancing the questionnaire's utility for intervention planning and individualized support.

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