



## Where have you heard of ASD? Determining the sources of information for pre-service teachers on autism spectrum disorder

¿Dónde has oído hablar del trastorno del espectro autista? Identificando las fuentes de conocimiento docente sobre el TEA

Onde já ouviu falar do ASD? Determinação das fontes de informação dos futuros professores sobre a desordem do espectro do autismo

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Received: 29/03/2023; Revised: 19/04/2023; Accepted: 13/06/2023; Published: 01/07/2023

*Translation to English:* Maryanne Zarco Gillett



*To cite this article:* Gómez-Marí, Irene; Sanz-Cervera, Pilar; Larraz-Rada, Virginia; & Tárraga-Mínguez, Raúl. (2023). Where have you heard of ASD? Determining the sources of information for pre-service teachers on autism spectrum disorder. *ICONO 14. Scientific Journal of Communication and Emerging Technologies*, 21 (2). <https://doi.org/10.7195/ri14.v21i2.2023>

## Abstract

The number of cultural products that include main characters with autism spectrum disorder (ASD) has grown in recent years. This is a positive fact that makes ASD visible among society. However, these cultural products do not always project an accurate image of ASD, which can trigger the generation or perpetuation of stereotypes that hinder the inclusion of people with ASD. This study aims to identify and analyze the cultural products related to this diagnosis consumed by university students in the field of education. In total, 452 pre-service Spanish and Andorran teachers answered the questionnaire Sources of Information on ASD (FITEA, by its acronym in Spanish). The results show that the main sources of knowledge about ASD are television series and certain subjects of teacher training programs. Participants state that the type of information about ASD they receive most refers to social interventions and daily experiences of people with ASD. These results are positive, as they show an interest of pre-service teachers in ASD. This type of cultural products can be a starting point in ASD training, because of the limited space reserved for inclusive education in current training programs. In this line, the social image of autism projected in the media should be analyzed in university classrooms, confirming the correct ideas and debunking the myths and stereotypes that stigmatize the autistic condition.

**Keywords:** autism; autism spectrum disorder; college student; information sources; mass media; student-teacher

## Resumen

En los últimos años ha aumentado el número de productos culturales que incluyen personajes protagonistas con trastorno del espectro autista (TEA). Este hecho permite visibilizar este trastorno entre la sociedad. Sin embargo, los productos culturales no siempre proyectan una imagen ajustada del TEA, lo que puede desencadenar en la generación o perpetuación de estereotipos que dificulten la inclusión de las personas con TEA. El presente estudio persigue identificar y analizar los productos culturales relacionados con dicho diagnóstico que consumen estudiantes universitarios del ámbito de educación. En total, 452 futuros docentes españoles y andorranos respondieron el cuestionario Fuentes de Información sobre el TEA (FITEA). Los resultados muestran que las principales fuentes de conocimiento sobre este trastorno son las series de televisión y ciertas asignaturas de la formación universitaria inicial. Los participantes afirman que el tipo de información sobre el que reciben mayor contenido está relacionado con la intervención social y las vivencias diarias de personas con TEA. Estos resultados son positivos, ya que evidencian un interés de los futuros docentes por este diagnóstico. Dado el espacio reducido que se reserva a la educación inclusiva en los actuales planes de estudio

del profesorado, este tipo de productos culturales puede utilizarse como punto de partida en la formación sobre TEA, de manera que en el aula universitaria se analice la imagen social que se proyecta sobre las personas con autismo, confirmando las ideas acertadas y desmintiendo los mitos y estereotipos que estigmatizan la condición autista.

**Palabras clave:** autismo; estudiante-profesor; estudiante universitario; fuente de información; medios de comunicación de masas; trastorno del espectro autista

## Resumo

Nos últimos anos, tem havido um aumento no número de produtos culturais com personagens com desordem do espectro do autismo (DEA). Este é um desenvolvimento positivo, uma vez que aumenta o perfil do DEA na sociedade. Contudo, os produtos culturais nem sempre projectam uma imagem precisa do DEA, o que pode levar à geração ou perpetuação de estereótipos que dificultam a inclusão de pessoas com DEA. Este estudo visa identificar e analisar os produtos culturais relacionados com a DEA que são consumidos por estudantes universitários no domínio da educação. No total, 452 futuros professores espanhóis e andorranos responderam ao questionário Fontes de Informação sobre a DEA (FITEA). Os resultados mostram que as principais fontes de conhecimento sobre DEA são séries televisivas e certas disciplinas do ensino universitário inicial. Os participantes declaram que o tipo de informação sobre a qual recebem mais conteúdo está relacionado com a intervenção social e as experiências diárias das pessoas com DEA. Estes resultados são positivos, uma vez que mostram que os futuros professores estão interessados neste diagnóstico. Dado o espaço reduzido reservado à educação inclusiva nos actuais planos de estudo dos professores, este tipo de produtos culturais pode ser utilizado como ponto de partida na formação sobre DEA, para que na sala de aula universitária seja analisada a imagem social projectada sobre as pessoas com autismo, confirmando as ideias correctas e refutando os mitos e estereótipos que estigmatizam a condição autista.

**Palavras-chave:** autismo; aluno-professor; desordem do espectro do autismo; estudante universitário; fonte de informação; meios de comunicação social

## 1. Introduction

Scientific research on autism spectrum disorder (ASD) began in the mid-1940s with the publications of child psychologists Leo Kanner and Hans Asperger. Since then, research on this disorder has increased significantly and has become one of the most studied childhood diagnoses (Nordahl-Hansen et al., 2018).

However, most of the general population, including teachers, do not get their information on ASD from the scientific literature (Dean & Nordahl-Hansen, 2022; Rohr, 2015). The knowledge they have on ASD usually comes from the media, such as television, or other

cultural products in which it is increasingly common to see people with ASD symptoms or who openly express themselves as people with autism (Garner et al., 2015; Jacoby et al., 2019; Rohr, 2015).

These sources of information have a strong impact on the social representation of ASD (Kollia et al., 2017), given the important role they play in the inclusion of people with autism (Garner et al., 2015). With this in mind, it becomes imperative to examine and monitor the image of ASD that these type of media are projecting.

## **1.1. Autism spectrum disorder in the media**

The DSM-5 (APA, 2013) defines ASD as a neurodevelopmental disorder characterized by persistent communication and social relationship problems in different settings, as well as limited and repetitive behaviors, interests, or activities.

Each individual with autism exhibits these characteristics in a very heterogeneous and diverse way (APA, 2013; Prochnow, 2014), which is why some studies highlight how difficult it is for society as a whole to have and show a good predisposition and understanding towards people with this diagnosis. Another challenge for society is the absence of physical markers that can predict behavioral difficulties and anticipate certain expected behaviors, which are associated to the diagnosis and are well beyond the will or intention of the individual with ASD. For this reason, the fight against the stigma associated with this disorder is complex, given that the rejection resides in the defining characteristics of the diagnosis itself (Liao et al., 2019).

One of the most difficult barriers towards inclusion is the preconceived stereotype or stigmatized social image that exists, in particular, towards people with neurodevelopmental disorders (Mazumder & Thompson- Hodgetts, 2019). The specific form that these stereotypes take is determined by culture (Liao et al., 2019) and one of the ways through which they are transmitted is through media products (Raya-Bravo et al., 2018). Therefore, the media representation of ASD becomes a key component in the inclusion process of people with functional diversity.

Depending on how this transmission is carried out, the media can be a tool for destigmatization, providing the public with information and fact-checking, and debunking falsehoods and myths, or it can support the perpetuation of myths and misinformation. For this reason, Kollia et al. (2017) discuss the need to include ASD professionals to create cultural products that can be disseminated to the general population, or even used as a tool in initial teacher training (Gómez-Marí et al., 2021).

Exploring the sources of media representations of autism is an important way to understand public perceptions, attitudes, and knowledge about the disorder, given that

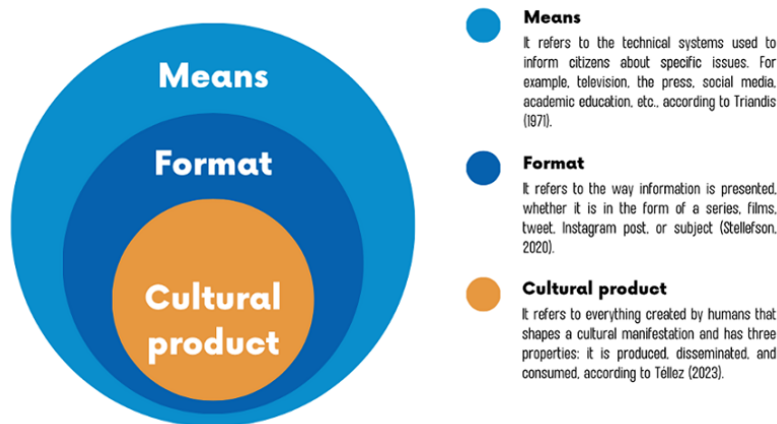
the information in the media, such as television, news, Google, Instagram, TikTok and other audiovisual platforms influence and shape people's beliefs towards individuals with ASD (Brewer et al., 2017).

## 1.2. Sources of information: means, formats, and cultural products

Although the study of the representation of ASD in the media is relatively new, we did find previous research that partially addressed our object of study.

First, we will distinguish the categories of sources that can spread information on ASD: means, formats and cultural products. This hierarchy, established after considering the contributions of Leal-Jiménez and Quero-Gervilla (2011), is reflected in Figure 1:

Figure 1. Sources of information on ASD



Source: Own elaboration based on the definitions of Stellefson et al. (2020), Tellez (2023) and Triandis (1971).

### 1.2.1. Means and formats on ASD

Mackintosh et al. (2005) carried out a survey in which they asked the parents of children with ASD about the sources of information and support regarding their children's condition. The results of this study showed that the most consulted source of information and support was the one referred to "other parents of children with ASD", which reinforces the idea that the main means of information on this diagnosis come from informal contexts which are far from scientific sources.

Along the same lines, although without considering the sources of information as the object of study, Van Herwegen et al. (2019) included items related to previous training in ASD, the handling of information about the disorder, and the type of media from which they acquired said information in a sociodemographic questionnaire intended for different

education professionals. The results showed that the most frequent source of information was the Internet (a quarter of the sample). In addition, 22% gathered information from different organizations, 14% had gone to parents of children with ASD for information, while less than 8% sought information from professionals or specialized books.

Kuzminski et al. (2019) were not interested in the specific sources of information, but included items that referred to two fictional television characters with ASD symptoms (Sheldon Cooper, the main character in the series *The Big Bang Theory*; and Raymond Babbitt, the main character in the movie *Rain Man*), using them as a reference to explain and demystify autism. These researchers surveyed a total of 1,054 citizens and their results demonstrated gaps in ASD knowledge.

Yu et al. (2020) conducted a comparative study to measure ASD awareness and stigma in the United States and China. In total, 1,127 US citizens and 1,254 Chinese citizens participated. One of the questions they answered in the questionnaire was: "Where does your knowledge on ASD come from?"

The findings highlight that compared to US citizens, Chinese citizens depend much more on television programs and movies (41% vs. 23%), the Internet (51% vs. 26%) and social networks (38% vs. 20%).

On the other hand, although previous literature offers content analysis of social networks to establish the defining framework for conditions such as ASD (Bie & Tang, 2015), the focus has not been placed on social networks as a reliable source of information.

According to *The Social Media Family* (2023), in 2021 there were 24 million Instagram accounts in Spain, 15.5 million TikTok accounts, and 4.2 million Twitter accounts. According to *Una vida online* (2023), 23% of Spanish Instagram users are between 16 and 24 years old and use this particular social media to share content, learn about brands and products, and entertain themselves; while 41.4% of TikTok users who are between the ages of 18 and 24 use it for entertainment, content sharing and to keep up with current news and events. Thus, we also consider it necessary to analyze the role of social media in this area, given that they can be a relevant channel to transmit information on ASD.

### **1.2.2. ASD cultural products**

Following the proposal of Téllez (2023), we can define "cultural product" as any human elaboration, which constitutes a cultural manifestation and is the result of a creative act which fulfills three properties: it is produced (or elaborated), distributed (disseminated, exhibited, and shared) and consumed (read, watched, or listened to). Therefore, in this study cultural products will include any film, series, documentary, program, radio



broadcast, news item, post, tweet, text, video, image, subject, or literary work that reports on ASD.

There are several media products that feature main characters with ASD. Garner et al. (2015) and Rohr (2015) highlight series and movies. Along these lines, Moore (2019) examines the character of Shaun Murphy in *The Good Doctor*, a young doctor with autism and high abilities. Although the series helps to break down some of the stereotypes associated with this condition, the main protagonist perpetuates the "know-it-all" figure, characterizing the savant syndrome (also called the idiot savant syndrome), by which people with diagnoses such as ASD simultaneously present unexpected exceptional abilities in a specific area and significant limitations in other facets of development, in which they should have no difficulties (Gewirtz, 2021).

In this line, Nordahl-Hansen et al. (2018) scored to what extent certain films and series portraying characters with ASD reflected, more or less accurately, the characteristics described by the DSM-5 (APA, 2013). Among them, we highlight that *The Big Bang Theory* obtained a 8 out of 12. The authors warned that the prevalence of extraordinary cognitive abilities was repeated in up to 12 of the 26 characters analyzed (46%), a higher figure than the estimates of the real population of people with ASD and high capabilities.

Years later, Dean and Nordahl-Hansen (2022) reviewed twenty-five studies that analyzed the content of movies and television series with a total of 19 main characters with autism, including Sam, the main character in the *Atypical* series. In general, the authors found diversity among the characters described, representing from neurotypical or even extraordinary levels of intelligence to characters with ASD and intellectual disabilities.

For their part, Stern and Barnes (2019) pointed out that watching series is more effective than watching movies, in terms of knowledge and the generation of positive feelings towards ASD, given that the exposure to the characters over time allows the viewer to discover new facets and characteristics little by little that contribute to drawing a more complete image than is usually generated through a film.

### **1.3. Type of information offered by the sources**

Traditionally, the coverage of ASD in the news has focused on the transmission of information provided by medical, governmental, family sources and non-profit associations (McKeever, 2013), translating into themes related to charitable acts (Bie and Tang, 2015), educational, civil rights and social aspects (such as school violence), and the medical (Pesonen et al., 2020) and scientific field (Bie and Tang, 2015).

On the other hand, we find social networks, which are a niche study of interest, given that they allow the creation of virtual networks of members who easily and quickly share

information and opinions through multimedia products that combine video, image, text, and audio (Stellefson et al., 2020). Kolia et al. (2017) concluded that YouTube offered content on some characteristic patterns, therapies, and the economic and emotional cost of ASD in the family.

Duval et al. (2021) determined seven themes that emerged from the content analysis of TikTok videos: information about everyday life, breaking stereotypes, gamification, therapy and rehabilitation, impossible challenges, and advantages of diversity. Other social networks on the rise such as Instagram, although they have not been the purpose of research studies on inclusive education for students with ASD, have been indicated as appropriate means to mitigate stereotypes associated with functional diversity (Mitchell et al., 2022).

## **1.4. Study aim**

The aim of this study was to analyze the ASD sources from which future teachers receive information on this diagnosis. Said general objective was specified into three specific ones: a) to explore the sources of information from which future teachers obtain information about ASD; b) to identify and develop a battery of cultural products that address the autism spectrum disorder; and c) to determine the type of ASD information that future teachers report from said sources.

As far as we know, this is the first international study that analyzes these issues in future teachers.

# **2. Material and Methods**

## **2.1. Design**

After analyzing the existing literature, we observed that our object of study has been scarcely addressed so far. For this reason, a descriptive-exploratory research design was proposed, given that the aim was to collect information that can serve as a starting point for future research.



## 2.2. Object of study

The object of study of this research includes all sources of information with content on ASD. Among the sources of information we distinguish: the mean (television, press, social networks, academic training...), the format (series, podcasts, films, videos, subjects, awareness campaigns, etc.), and specific cultural products (series - like The Big Bang Theory or The Good Doctor-, videos from social media accounts such as Instagram, specific subjects of education degrees such as "Attention to diversity", tweets, etc.) In addition, we explore the type of information that is disseminated in these sources of information.

## 2.3. Participants

The present study involved 452 university students (384 women and 68 men), with a mean age of 20.73 years (  $SD = 4.41$ ), enrolled in university studies related to initial teacher training at the University of Valencia and the University of Andorra. Table 1 shows the main demographic characteristics of the participants and the responses regarding specific training and previous contact with people with ASD.

Table 1. Demographic characteristics of the sample

		n	(%)
University	University of Valencia	394	(87.2%)
	University of Andorra	58	(12.8%)
Current degree	Early Childhood Education	92	(20.4%)
	Primary Education	294	(65%)
	Master's in Secondary Education	8	(1.8%)
	Bachelor of Teaching and Learning	41	(9.1%)
	Master's in Education	17	(3.8%)
Related studies on special needs	Different from TP or SLP	414	(91.6%)
	TP or SLP	38	(8.4%)
Current year	1st	112	(24.8%)
	2nd	243	(53.8%)
	3rd	54	(11.9%)
	4th	18	(4%)
	Master	25	(5.5%)
	Have you received specific training on inclusive education?	Yes	289
No		163	(36.1%)
Have you received specific training on ASD?	Yes	230	(50.9%)
	No	222	(49.1%)
Do you have close contact with a person with ASD?	Yes	310	(68.6%)
	No	142	(31.4%)

Note TP: therapeutic pedagogy; SLP: speech language pathology.

Source: Own elaboration

Additionally, 95.6% of the participants claimed to use social networks on a daily basis; 46.9%, streaming platforms; while 41.8% stated that they used television.

## 2.4. Procedure

The study was carried out between the months of November 2022 and January 2023.

The selection of the sample was carried out using convenience sampling in the degrees of Early Childhood Education and Primary Education and the master's in Secondary Education of the University of Valencia and in the Bachelor of Teaching and Learning and the master's in Education from the University of Andorra.

The students completed the questionnaire using the Google Forms tool. Before administering the questionnaire, its content and the objectives of the study were briefly explained. All participants filled out an informed consent. Participation in the study was voluntary and no material or other compensation was offered. The study was approved by the Ethics Committee of the University of Valencia (UV-INV\_ETICA-2307674).

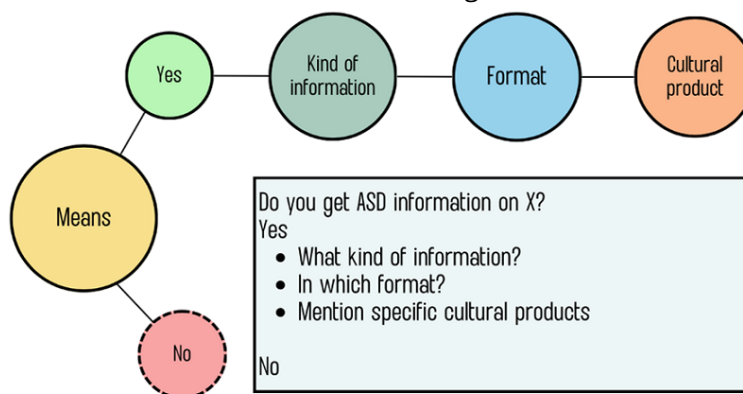
## 2.5. Instruments

The questionnaire Sources of Information on ASD (hereinafter, FITEA) is composed of 47 items (13 sociodemographic questions and 34 on the object of study that combine "yes" or "no" dichotomous questions, multiple-choice questions with the possibility of choosing more than one option and short-answer open questions).

For each of the media (television, news, Instagram, TikTok, YouTube, initial teacher training, etc.), the question structure shown in Figure 2 was used.

Figure 2. Structure of the FITEA questionnaire

Note. "X medium" refers to television, news, radio, Instagram, YouTube, initial teacher training, etc.



Source: Own elaboration

Regarding formats, the response options varied depending on the means. For example, in the case of television, you could choose several possibilities: movies, series, documentaries, newscasts. The response options, for the type of information reported from each source, were the following eleven: medical intervention; educational intervention; social intervention; communication intervention; sensory intervention; daily experiences; injustices that individuals with ASD experience and must face on a daily basis; achievements; honorable acts carried out by people with ASD; vandalism or aggressive acts; and comical or humorous situations involving individuals with ASD. The answer to the question “Mention specific cultural products” was open.

The first author of the study developed a draft of the ad hoc questionnaire. The items referring to the type of source and the source format (television, radio, press, film, series, etc.) were created based on the contributions of Kuzminski et al. (2019), Mackintosh et al. (2005), VanHerwegen et al. (2019), and Yu et al. (2020). For the items referring to the type of information from each of the sources, the thematic categories of the content analysis carried out by Bie and Tang (2015), Duval et al. (2021), Kollia et al. (2017), Mckeever (2013), and Pesonen et al. (2020) was used.

The validation of the questionnaire was carried out by expert judgment, in which twelve doctoral researchers from the fields of Educational Sciences and Psychology participated. These individuals had research experience in projects related to ASD and/or were active members in family associations of children with ASD. On a scale of 1 to 4, with 4 being the highest score, the average assessment of the experts on the degree of comprehension, importance and relevance of the items was 3.75, 3.9, and 3.85, respectively. The total score of the questionnaire was 3.83. The items that scored the lowest were submitted to review and modified by the research team.

## **3. Results**

### **3.1. Means of information from which future teachers acquire information regarding ASD**

Our first objective was to explore the sources of information from which future teachers receive content on ASD. Results reveal that television and streaming platforms are the main source of information. More specifically, participants report receiving information on ASD through series and movies. A significant number of participants also report getting information about ASD through social media, while the rest have less weight as a source of information (see Table 2).

Table 2. Means from which the participants report receiving information about ASD

Mean	n	%
Television	292	64.6%
Streaming platforms	217	48%
Instagram	170	37.6%
TikTok	126	27.9%
Twitter	96	21.2%
News	72	15.9%
YouTube	28	6.2%
Radio	25	5.5%
Facebook	14	3.1%

Note n: number of participants who confirm receiving information about ASD; %: percentage of participants of the total sample that represents the frequency in column "n".

Source: Own elaboration

### 3.2. Cultural products that address the autism spectrum disorder

Our second objective was to identify the cultural products (series and films) or, failing that, the specific broadcasters (television channels and/or specific programs) that address ASD. This would allow us to offer a list of useful tools for subsequent content analysis or for its use as a source of knowledge and demystification of the condition of ASD.

The results reveal that students report receiving information in very similar proportions through two very different sources: on the one hand, through television series, in which the main characters exhibit marked autistic features (mainly in the series *The Good Doctor* and *Atypical*); on the other hand, through the initial training subjects in which issues related to special education are addressed (see Table 3).

Table 3. Specific products through which future teachers learn about ASD

Cultural products	Format	Mean	n
The Good Doctor	Series	Television and streaming platforms	383 (85%)
<hr/>			
Atypical			
<hr/>			
SEN, Psychology, Basic training subjects, Internships, TP and SLP subjects	Subject of the master's degree / Bachelor degree	University education	248 (55%)

Note The Good Doctor: n=218; Atypical : n= 165; Only those products mentioned by at least 35% of the participants have been included.

Source: Own elaboration.

In addition, it is important to highlight that 70 participants mentioned Instagram or TikTok accounts managed either by people with ASD, or by their family. That is, 70 participants obtain information from a real source, based on the testimony of families who narrate their day to day.

### 3.3. Type of information about ASD that future teachers report from said sources

Our third objective was to analyze the type of information on ASD that future teachers perceive more frequently. The results show that the type of information that the participants report to a greater extent is information related to social interventions (this option has been selected on a total of 642 occasions, adding all types of information sources). Other types of information that the participants report to a high degree is information related to the daily experiences of individuals with ASD (selected 592 times), injustices suffered by people with ASD (selected 486 times) and educational interventions (selected 460 times). Table 4 shows the data with the number of times that the students report each type of information from each of the channels.

Table 4. Type of information perceived by the participants who receive content on ASD from each source

Source	n	Soc	Viv	Injus	Edu	Com	Logr	Med	Sens	Hon	Hum	Agr
<b>TV</b>	292	181 (62%)	168 (57,5%)	142 (48,6%)	118 (40,4%)	101 (34,6%)	95 (32,5%)	50 (17,1%)	49 (16,8%)	60 (20,5%)	46 (15,8%)	18 (6,2%)
<b>Streaming Platform</b>	217	144 (66,4%)	149 (68,7%)	117 (53,9%)	73 (33,6%)	84 (38,7%)	110 (50,7%)	63 (29%)	50 (23%)	63 (29%)	49 (22,6%)	21 (9,7%)
<b>Instagram</b>	170	102 (60%)	88 (51,8%)	64 (37,6%)	107 (62,9%)	71 (41,8%)	50 (29,4%)	36 (21,2%)	43 (25,3%)	27 (15,9%)	12 (7,1%)	7 (4,1%)
<b>Tiktok</b>	126	74 (58,7%)	84 (66,7%)	53 (42,1%)	50 (39,7%)	55 (43,7%)	42 (33,3%)	25 (19,8%)	34 (27%)	24 (19%)	21 (16,7%)	9 (7,1%)
<b>Twitter</b>	96	57 (59,4%)	44 (45,8%)	48 (50%)	41 (42,7%)	28 (29,2%)	3 (3,1%)	15 (15,6%)	12 (12,5%)	0	10 (10,4%)	2 (2,1%)
<b>News</b>	72	40 (55,6%)	28 (38,9%)	33 (45,8%)	35 (48,6%)	20 (27,8%)	18 (25%)	21 (29,2%)	14 (19,4%)	8 (11,1%)	2 (2,8%)	5 (6,9%)
<b>Youtube</b>	28	17 (60,7%)	18 (64,3%)	13 (46,4%)	14 (50%)	18 (64,3%)	9 (32,1%)	8 (28,6%)	11 (39,3%)	6 (21,4%)	5 (17,9%)	3 (10,7%)
<b>Radio</b>	25	19 (76%)	7 (28%)	9 (36%)	9 (36%)	12 (48%)	9 (36%)	5 (20%)	3 (12%)	6 (24%)	2 (8%)	3 (12%)
<b>Facebook</b>	14	8 (57,1%)	6 (42,9%)	7 (50%)	13 (92,9%)	10 (71,4%)	14 (100%)	4 (28,6%)	6 (42,9%)	6 (42,9%)	2 (14,3%)	2 (14,3%)

Note The type of information has been included in order of frequency. Soc: social intervention; Exp: daily experiences; Inj: injustices that they experience and have to deal with on a daily basis; Edu: educational intervention; Com: communication intervention; Ach: achievements; Med: medical intervention; Sen: sensory intervention; Hon: honorable acts carried out by individuals with AS; Hum: comical or humorous situations involving people with ASD; Agr: vandalism or aggressive acts carried out by individuals with ASD.

Source: Own elaboration.

## 4. Discussion

The objectives of this study were to identify the sources of information on ASD from which future teachers receive content on this diagnosis; determine the specific cultural products in which ASD is represented; and identify the types of information perceived in each of these media.

Knowing the sources through which future teachers receive information is a notably relevant aspect for the educational and social inclusion of people with ASD, given that the specific training received on special education during initial training is relatively scarce (Sánchez -Serrano et al., 2021), and knowledge from sources other than initial training may become the first source of content on ASD (Brewer et al., 2017).

The results show that the participants have a wide range of sources of information about ASD that can be beneficial and lead to social representations that adjust to the heterogeneous nature of the diagnosis (Conn and Bhugra, 2012), contrary to the results obtained by Prochnow (2014) and Raya-Bravo et al. (2018), who claimed that the media tend to project a typified and simplistic image of the disorder.

The most common sources in this study are television and streaming platforms, specifically in film and series format, coinciding with other authors (Garner et al., 2015;



Jacoby et al., 2019; Rohr, 2015; Yu et al., 2020). These data maintain some consistency with the figures reported by previous reports (Statista, 2023). Specifically, series turn out to be the most common source of information on ASD among aspiring teachers. This finding is positive, given that according to Stern and Barnes (2019), series have more significant effects than movies, because it is through series that connections are created between the viewer and the character, introducing the former into the experiences of the latter, and inviting reflection on everyday aspects, as well as on authentic moral dilemmas.

Our participants mostly allude to the series *The Good Doctor* and *Atypical*. This result is encouraging, because, according to studies such as that of Dean and Nordahl-Hansen (2022), Gewirtz (2021) and Moore (2019), these series can show a fairly accurate image of what it means to have a diagnosis of ASD according to the diagnostic criteria of the DSM-5 (APA, 2013).

The results also suggest that the media may have a contradictory double function, either to demystify autism or to perpetuate stereotypes based on misconceptions, such as the know-it-all, denounced by authors such as Dean and Nordahl-Hansen (2022) or Moore (2019). In line with Raya-Bravo et al. (2018), even though using stereotyping as a recurring tool can contribute to discovering certain characteristics of the diagnosis, it can also reproduce biases derived from the complexity of representing the heterogeneity of the autism spectrum.

Second, future teachers claim to receive information on ASD during their initial university training. The fundamental objective of the subjects mentioned by the participants is to establish the introductory bases of the field of inclusive education; exposing the main organizational and curricular measures that are usually proposed to attend to diversity in the school context, as well as the foundations of psychoeducational interventions in students with special educational needs (SEN) (which specifically includes a topic that addresses ASD).

According to Bie and Tang (2015), this source of knowledge deserves special attention, considering the transmission of rigorous scientific content on the diagnosis of ASD.

Initial teacher training courses constitute a first contact with functional diversity, and may be a first source of awareness towards the disorder on which we focus in this study. However, the training that future teachers in this field usually receive is relegated to isolated subjects which broadly cover the different diagnoses, and do not delve deeper into each specific SEN.

In addition, a priori, these are theoretical subjects, in which there is usually no contact with people with ASD or their families, which is one of the most effective means of raising awareness and adopting favorable attitudes towards the inclusion of stigmatized groups (Gronholm et al., 2017) as supported by previous studies on ASD (Mackintosh et al, 2005; Van Herwegen et al., 2019).

This is precisely what some social media accounts like Instagram, TikTok or YouTube channels managed by people with ASD, or by family members try to achieve by bringing users closer to the daily reality of the autistic community. These types of accounts are used by slightly more than 15% of the participants in this study. Although an exhaustive analysis of the content of the specific accounts that participants claim to follow has not been carried out, some previous studies suggest that this is a valid option to inform and sensitize future teachers (Carroll et al., 2003).

We could hypothesize that the effects of Instagram and TikTok accounts (two sources widely used by the participants in this study) can be the same or even more positive than those of the series, given that following the contributions of Stern and Barnes (2019), the periodic display of content helps to create follow-up spaces, in which the viewer empathizes and approaches the reality of a fictional character. Moreover, in this case it would not be fiction, but the real life of individuals with ASD and their families, who show both positive and negative aspects of their daily life.

Regarding the type of information that the study participants perceive in the media, the results indicate that the most frequent information is related to social intervention with students with ASD. We believe that this result is positive, given that, in the current inclusive school framework, one of the main functions of teachers is precisely to promote this type of intervention.

Second, we find information about the daily life of people with ASD. This also is also encouraging, as it allows future teachers to approach the ordinary realities of their potential students with autism. This type of information, associated with the dissemination from reference sources, has been previously analyzed (Duval et al., 2021), together with the third type of information, about injustices experienced by people with ASD, a type of information that can contribute to the sensitization of future teachers, making them aware of different realities that they will probably encounter in their future students (Duval et al. 2021; Pesonen et al. 2020).

In fourth position, we find information on educational intervention. This is also positive and expected as it is a sample of future teachers who will be in contact with students with ASD. Likewise, and assuming the educational function of the media supported by other sources (Raya-Bravo et al., 2018), we can discern the formative nature that series and social media accounts form in the process of configuration and renewal of the professional teacher.

## **4.1. Study limitations**

This study has some limitations that should be considered when assessing the scope of the results. Regarding the selection of participants, the sample of future teachers comes

from two limited contexts, the University of Valencia, and the University of Andorra, so the results cannot be generalized to other contexts. Regarding the results, we have analyzed which sources future teachers use to find information on ASD, but we have not analyzed the number of hours they spend with each source, nor the assessment they make of the quality of the information.

## **4.2. Future lines of research**

Given that this is the first study that has systematically analyzed the sources of information on ASD used by future teachers, we believe that these results open up a new line of research.

First of all, these same objectives could be analyzed with other relevant agents for the educational and social inclusion of people with ASD, such as active teachers (not only in training); parents of students with ASD; professionals or future professionals (other than teachers) who play a relevant role in the education of children with ASD; or even the students of the compulsory stages of the educational system in which young people with neurotypical development share classes with classmates with ASD.

In addition, it would be interesting to evaluate the relationship between the sources of information on ASD and relevant variables for educational and social inclusion, such as knowledge, attitudes, and teacher self-efficacy to deal with the education of these children.

Finally, it would be interesting to extend the analysis of the sources of information used by teachers and future teachers to other contexts, national and international, to find out about this diagnosis, given that cultural products such as television series or social media accounts can vary in different contexts, which can be related to the different social representations of ASD that currently exist.

## **5. Conclusions**

Identifying the sources of ASD information that future teachers consume is crucial because it can allow us to assess the quality of the information transmitted and the stigma that prevails in our society. For this reason, this study constitutes a first step in exploring and analyzing the content referring to ASD in the different and abundant sources of information.

Future teachers consume television series and social media accounts in which ASD plays a relevant role. This fact is positive: it seems that interest in the ASD phenomenon is growing. However, it can have a negative effect, given that there is a risk that the myths and

stereotypes of these products become entrenched and are considered truly representative of people with ASD.

Furthermore, inclusion training has a secondary role in teacher training degrees (Sánchez-Serrano et al., 2021). For this reason, the professionals involved in this initial training should consider using resources with which the students are familiar, as a starting point for scientific and rigorous training (Dean and Nordahl-Hansen, 2022; Rohr, 2015). In this way, we can take advantage of the intrinsic interest of the students themselves, who regularly consume this type of product, to offer scientific training in which certain aspects of the image of ASD projected on these products are confirmed or demystified.

## Contribution of the authors

**Irene Gómez-Marí:** Conceptualization, Writing–Original Draft, Writing–Review and Editing, Project Administration, Funds Acquisition, Methodology and Formal Analysis. **Pilar Sanz-Cervera:** Writing–Review and Editing, Formal Analysis. **Virginia Larraz-Rada:** Writing–Review and Editing, Formal Analysis. **Raúl Tárraga-Mínguez:** Writing–Original Draft, Writing–Review and Editing, Formal Analysis. All authors have read and agree to the published version of the manuscript. Conflicts of interest: The authors declare that they have no conflict of interest.

## Financing

This study received human and financial resources from the Ministry of Education (Government of Spain), grant codes FPU19/06330 and EST22/00663 and from the University of Valencia, through an International Mobility Scholarship for Doctoral Students of the University of Valencia for the year 2022.

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