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# Consideration of the E-health Literacy of Preschool Children's Parents in Zanjan City

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## ABSTRACT

**Objective**: The aim of this study was to assess the level of electronic mental health literacy among parents of preschool children and to investigate the relationship between their literacy level and their knowledge of common mental health disorders and their children's problems.

**Methods**: Survey data were collected from 14 preschool children in Zanjan City and analyzed using descriptive statistical methods. Parents completed online mental health status questionnaires about their knowledge of common mental health disorders among children.

**Results**: The results indicated that the electronic mental health literacy of parents was high, while their knowledge of their children's mental health disorders was low. Only 8.6% of them were able to correctly diagnose all three disorders presented, and among them, 40% diagnosed attention-deficit/hyperactivity disorder, 20% diagnosed autism, and 6.35% diagnosed separation anxiety disorder. Parents with high levels of electronic mental health literacy were receptive to professional help and sought information to solve their children's behavioral problems. Children of parents with low electronic mental health literacy were more likely to experience higher rates of mental disorders. The risk of children of parents with low electronic mental health literacy being more prone to mental disorders.

**Conclusions**: The research findings are used to inform stakeholders about the use of online resources in diagnosing children's mental health status and promoting timely intervention.

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## Introduction

The growing use of the internet worldwide has provided unprecedented access to vast amounts of information (Jacobs et al., 2017). The use of the internet and mobile phones has also made information accessible anytime anywhere (Rasouli et al., 1397). According to global statistics, the rate of internet usage in Iran was reported to be 1.69% in 2018. Online health information is obtained from various sources, including organizational and personal websites, online support groups, and personal blogs where people exchange health information. Psychological problems (Bish & Michie, 2010; Lau et al., 2010; Sauer et al., 2020), including increased self-obsession and anxiety, are among the consequences of the massive amount of information in the media (Garfin et al., 2020). In particular, individual blogs or forums may promote the circulation of false and misleading information, as it is possible to post any content in them (Marcon et al., 2017; Stellefson et al., 2011). Also, the circulation of wrong information in the virtual space can increase the possibility of self-diagnosis or self-treatment (which is not necessarily done in the correct way) (Southwell et al., 2017). More than anything else, the main concern is with parents who use the Internet as a source of information when faced with specific conditions or symptoms of their children's illnesses (Benedicta et al., 2019). Training parents to carry out interventions increases their sense of empowerment, and reduces their depression and stress levels (Hakim Shooshtari et al., 1398). In order to promote the optimal development of children who have developmental delays or disabilities in the early years of their childhood, continuous and systematic efforts are made under the name of early intervention (Dunst, 2007; Noonan & McCormick, 2006).

Children's mental health disorders encompass a wide range of developmental, neurological, behavioral, and emotional conditions that first manifest in childhood and can have significant costs if they persist into adolescence and adulthood (Snell et al., 2013). Among these, Separation Anxiety Disorder is one of the most common childhood problems, and it is often associated with other disorders such as attention deficit hyperactivity disorder (ADHD), autism spectrum disorder (ASD), depression, and Tourette Syndrome (Jonsson et al, 2017; Perou et al., 2013; Schaefer, 2015). Attention deficit and hyperactivity disorder include behaviors that a child exhibits in different social situations (any situation where other people are present besides the child) and cause disruption in social situations (Ganji, 1395). Among the prominent features of this disorder, we can mention the inability to control behavior, attention deficit, inability to learn, aggressiveness, academic problems, restlessness, and agitation (Dineen & Fitzgerald, 2010). In addition to this disorder, autism spectrum disorders are also considered as other childhood problems that, in addition to the social development of the child, also affect the child's ability to communicate and cause unusual behaviors such as repetitive movements (Kirk et al., 1395). Koegel and Koegel (2016) define autism



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disorder on the one hand as an abnormal development or failure in social-communicative interaction and on the other hand, a limitation in performing activities. Despite diagnostic and treatment criteria, most disorders in children are underdiagnosed or undertreated (Simon et al., 2015). In relation to this issue, parents' perceptions and their awareness of children's mental health needs are among the most determining criteria for diagnosis and treatment (Abera et al., 2015; Sayal et al., 2003; Rickwood et al, 2007). Since the correct diagnosis of disorders and timely intervention during the period of developmental changes and neuroplasticity of the brain in childhood increases the effects of treatment and reduces adverse outcomes in the long term, healthcare providers consider parents as an important group in research (Luby, 2011; Pescosolido et al., 2008).

Mental health literacy includes knowledge of how to prevent mental disorders, methods of help and access to available treatments, self-help strategies, and the skill of helping people with mental disorders (Jorm, 2012). Parents should have access to the relevant and accurate health information about children's mental health disorders in order to recognize possible problems and make informed decisions to help their children (Jensen et al., 2011). Their training, along with clinical interventions, improves the mental health of parents and children (Babaie Aghdam et al., 1400). Informing parents about the common disorders of children enables them to better differentiate between the symptoms of mental health disorders and behaviors specific to the child's social-emotional development period (Abera et al., 2015). In order to be aware of these types of disorders, it is necessary for parents to have information about them, but there may be several obstacles such as limited education, time constraints, poor health literacy, insufficient skills in searching and evaluating information, and lack of trust in them due to the changeable nature of the available information which prevents access to valid information or their effective use (Benedicta, 2019). If parents of children with mental health problems are unable to validate the information they receive, the lack of accurate mental health information coupled with the widespread use of the Internet as a research tool can be considered a serious public health concern (Knapp, 2011). Based on this, the aim of this study was to measure the status of electronic mental health literacy of parents and to investigate the relationship between the level of this literacy and parents' knowledge about the common mental health disorders of their children. The term E-health literacy refers to health information and services obtained through the Internet and other technologies. This scientific phenomenon has countless advantages, including creating more geographical coverage and



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broader communication, prevention, and treatment of diseases, increasing doctor-patient interaction, creating a healthy competitive environment between health care providers, providing more appropriate services, and establishing communication between experts and citizens (Qazi Mirsaied, 1396). According to the ACA[1] statement, electronic health literacy is a degree of individual skills and competencies needed to provide, communicate, process, and understand basic health information and services needed to make health decisions. The objectives of the research include the following:

The first objective is assessing the electronic mental health literacy of parents of preschool children. For the explanation of this term, Hiscock (2022), found that parents' mental health literacy can be improved through the use of digital health interventions (DHIs). Johnson et al. (2023), evaluated the mental health literacy of teachers and parents/carers regarding mental health problems in childhood. A mixed-methods, multi-site case study evaluation assessed a prototype digital mental health literacy intervention for children and young people aged 11-15 in Java, Indonesia (Brooks et al., 2023). A study published in Taylor & Francis Online evaluated the E-Mental health literacy and knowledge of common child mental health disorders among parents of preschoolers (Cormier et al., 2020). Peyton et al. (2019), found that investigated whether DHIs improve mental health literacy or help-seeking among parents of children aged 2-12 years with behavioral and emotional problems. The gap in the literature is that there is limited research on the electronic mental health literacy of parents of preschool children. While some studies have evaluated the mental health literacy of parents of adolescents or children with behavioral and emotional problems, there is a lack of research on parents of preschool children. This study is significant because early intervention is crucial for the prevention and treatment of mental health problems in children. Parents play a critical role in identifying and seeking help for their child's mental health problems, and electronic mental health interventions may be an effective way to improve their mental health literacy and help-seeking behaviors. Therefore, this objective is important for developing effective interventions to support parents in promoting their child's mental health.

[1] American Counseling Association



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The second objective is related to determining the level of parents' awareness of common mental disorders in children, which is crucial for early detection and treatment of these disorders. Parents' perception and awareness of psychiatric disturbance in children is an important determinant of early detection and treatment seeking for the condition (Abera et al., 2015). A study in Turkey found that only 27.5% of parents were able to identify ASD correctly (McGinnis, 2022). Also, a study in Saudi Arabia found that only 22.5% of parents were able to identify SAD correctly (Abera et al., 2015). Additionally, a systematic review of the literature on mental health literacy for supporting children found that parents' knowledge and recognition of mental health problems in childhood varied across different studies, Some studies reported low levels of knowledge and recognition of specific disorders such as ADHD and ASD, while others reported higher levels of general mental health knowledge across childhood disorders (Johnson et al, 2023). These findings suggest that there is a need for increased education and awareness among parents regarding common mental disorders in children. Early detection and intervention can significantly improve outcomes for children with these disorders, and parents play a critical role in this process. Healthcare providers can play an important role in educating parents about these disorders and providing resources for early detection and intervention.

The third objective is deal with examining parents' perception of their children's strengths and weaknesses, which is fundamental objective in this study, but there are a few studies which is related to this study. Briegel et al. (2019) conducted a study on parents' perception and awareness of psychiatric illness in children and adolescents and concluded that lack of problem recognition and awareness of available treatments reflects inadequate mental health literacy, which is linked to actions and mental health outcomes. Besides these findings, they found that parental perceptions guide parental decisions and actions, which in turn impact their children's psychosocial development. Understanding parents' perceptions of their children's strengths and weaknesses is important for several reasons: Firstly, it can help educators and healthcare providers tailor interventions and support to meet the specific needs of each child. Secondly, it can help parents identify areas where their children may need additional support and resources. Thirdly, parental perceptions guide parental decisions and actions, which in turn impact their children's psychosocial development. Finally, inadequate mental health literacy and a lack of problem recognition and awareness of available treatments can reflect inadequate parental perceptions of their children's



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strengths and weaknesses, which are linked to actions and mental health outcomes. Therefore, further research is needed to explore parents' perceptions of their children's strengths and weaknesses in different areas of development.

Explaining the level of parents' knowledge about children's mental health disorders and identifying the risk of children suffering from these disorders, based on the level of parents' electronic mental health literacy is a crucial issue for early detection of these disorders. A systematic review of the literature on mental health literacy for supporting children found that parents' and teachers' knowledge of mental health problems in children is likely to influence the timeliness and adequacy of support that children receive for mental health problems. The review found that there is a lack of consistent measures of mental health literacy and a lack of focus on parents (Johnson et al., 2023). Kusaka et al. (2022), found that parents of adolescents need to have sufficient mental health literacy to recognize mental health problems in their children and to assist them with help-seeking. Also, the review found that several educational programs have been developed to enhance parental mental health literacy, but their effectiveness has not been established. Despite the existing literature on parents' mental health literacy and their knowledge of mental health disorders in children, there is a gap in research on the relationship between parents' electronic mental health literacy and their knowledge of mental health disorders in children. Understanding the level of parents' electronic mental health literacy and its relationship with their knowledge of mental health disorders in children can help healthcare providers and educators develop effective interventions and support for parents to improve their mental health literacy and help-seeking behaviors. Therefore, further research is needed to explore the relationship between parents' electronic mental health literacy and their knowledge of mental health disorders in children.

## Materials and Methods

In order to conduct the research, a cross-sectional survey plan was used to survey the parents of children aged 2 to 5 years through the preparation and compilation of a questionnaire. One of the necessary conditions for participants in this study was having at least one preschool child and being 18 years old or more. Also, they were asked to answer questions related to 1) demographic characteristics 2) use of the Internet and E-Mental health literacy 3) awareness of common mental



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health disorders in children, and 4) their perceptions of children's strengths, and weaknesses. The time required to answer the survey was 15 to 20 minutes.

**Instrument**

To assess participants' E-Mental health literacy, a modified E-Health literacy scale (E-HEALS) was used (Norman & Skinner, 2006). The E-HEALS is an eight-item self-report tool that focuses on knowledge and understanding of what health information is available on the internet, where one can find helpful health resources, how to access this information, skills to evaluate the online health information, and the ability to discern high and low health resources on the internet. This questionnaire uses a Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree), with a score range of 8 to 40, where higher scores indicate a higher level of electronic mental health literacy. A Cronbach's Alpha coefficient of .93 with good test-retest reliability among adults has previously been reported for this scale (Mitsutake et al, 2016). According to the purpose of this research, the expressions of this questionnaire were reworded to focus specifically on electronic mental health literacy. For example, the phrase "I know how to find useful health resources on the Internet" became the phrase "I know how to find useful mental health resources on the Internet".

To assess parent's knowledge of common childhood mental health disorders they were presented with three short vignettes of a preschool child with essential features of ASD, ADHD, and SAD. After each item was presented, the participants were asked to answer six four-choice questions based on the Jorm (2012) model. This model is used to check the level of mental health, assess the ability to diagnose disorders, and awareness of the causes of disorders, self-help interventions, sources of professional help, and how to obtain information.

Also, in order to evaluate the level of parent's awareness of their children's strengths and weaknesses, the strengths and weaknesses questionnaire for ages 2-4 was used. This questionnaire is a screening tool for parents and teachers that helps them identify children with behavioral or emotional disorders (Goodman & Scott, 1999). The evaluation questionnaire for 3–4-year-old children includes 22 items in five scales: 1- emotional symptoms 2- behavioral problems 3- attention deficit hyperactivity disorder 4- peer relationship problems 5- prosocial behavior (Goodman, 1997). This questionnaire also has a five-item supplemental section that evaluates the respondent's level of awareness of the problem and its chronicity, separation anxiety, and the burden of responsibility she has on others. Cronbach Alphas for the total difficulties score has been



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reported to range from 0.71 to 0.84 in 2-year-old children (D'Souza et al., 2017). In general, the strengths and weaknesses questionnaire provide useful information for doctors and researchers (Goodman & Scott, 1999).

Descriptive statistics were used to analyze the data. This method was carried out in order to measure the level of electronic mental health literacy of parents; also, data analysis was done based on their knowledge level of three common disorders and to discover the relationship between electronic mental health literacy and the scores of the strengths and weaknesses questionnaire. Parents' E-HEALS scores were divided into high (≥30) and low (<30) relative to the mean group value (M ¼ 30.79, SD ¼ 5.273).

## Results

The age of the participants was between 21 to 49 years. 82.8% of them were women and 54.9% of them were employed full-time. The level of education of the participants was different and more than half of them had a bachelor's degree (56.1%). Most of the respondents (89.7) who had health insurance coverage, reported that their children are in very good (52.2%) and excellent (38.4%) health conditions. Most parents (71.4%) or their children (80.9%) had not used mental health services. 71.6% of people used the provided services for the treatment of depression and 32.5% for anxiety. 20% of those who received these services for their children identified anxiety-related problems, 38.7% suspected attention deficit hyperactivity disorder, and 2.4% reported concerns about autism (Table 1).

**Table 1**. Participant information

| Participant's information | Percentage |
|---|---|
| Age (years) | 21-49 |
| Gender | 82.8% women, 17.2%men |
| Employment status | 54.9% Full-time, 45.1% part-time |
| Education Level | 56.1% Bachelor's Degree or higher, 43.9% lower than Bachelor's Degree |
| Health insurance coverage | 89.7% Yes, 10.3% No |
| Children's Health Conditions | 52.2% very good, 38.4% excellent |
| Mental Health Services which are not used | 71.4% Parents, 80.9% Children |
| Depression Treatment Services Usage | 71.6% Yes, 28.4% No |
| Anxiety Treatment Services Usage | 32.5% Yes, 67.5% No |
| Suspension of deficit hyperactivity disorder | 38.7% Yes, 61.3% No |
| Autism-Related Problems | 2.4% Yes, 97.6% No |



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In the conducted study, a significant proportion of the participants, precisely 70%, stated that most of their use of the Internet is done at home. They usually prefer to get help from the virtual space (42.6%) or from a doctor (53.4%) to access information that is related to mental health. Regarding the type of information, 45.3% of the participants use the internet to diagnose mental disorders and 15.9% to prevent these types of disorders. In order to examine the views of the participants, two questions were asked regarding the usefulness of electronic mental health information. The answers to the question "To what extent do you think that online information is useful for making decisions about your child's mental health?" 64% of the respondents stated that it is useful and 10.6% stated that it is very useful. In response to the question "How important is access to child mental health resources on the Internet?" The participants stated that it is important (64.3%) and very important (35.8%) (Table 2).

**Table 2**. Internet use

| | | | | | |
|---|---|---|---|---|---|
| Obtaining assistance | Internet and Media | 42.6% | usefulness of electronic mental health information | Useful | 64% |
| | Doctor | 53.4% | | Very useful | 10.6% |
| Type of information | diagnose mental disorders | 45.3% | Importance of Access to child mental health resources on the internet | Important | 64.3% |
| | prevent these types of disorders | 15.9% | | Very important | 35.8% |

Participants were asked to identify mental health disorders, focusing on the three disorders of hyperactivity, autism spectrum disorder, and separation anxiety, in three displayed vignettes. In response to the question "If your child has one of the mentioned symptoms, what will be your diagnosis?" 6.8% of all three types of disorders (ADHD, ASD, and SAD) were diagnosed, 40% of ADHD, 20% of ASD, and 35.6% of SAD were correctly diagnosed.

Participants were asked, "What do you think is the primary cause of your child's disorder?" Regarding hyperactivity disorder, 37.5% of people considered poor discipline, 33% genetic factors, and 20% lack of attention at home as the primary cause of this disorder. 65% of the participants stated that autism spectrum disorders have a genetic basis, while 6% of them considered the mother's infection during pregnancy and 15% considered the lack of parental affection or conflicting restrictions as the main cause of this disorder. 45% of people stated that



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the main cause of separation anxiety disorder is due to poor adaptation skills. 10% stated conflicting restrictions and 33.1% parental modeling or family history of anxiety as the primary cause of separation anxiety disorder.

The participants were asked what actions parents can take to deal with these three types of disorders. In all three types of disorders, more than half of the participants found it necessary to read about these disorders. Regarding the child with hyperactivity disorder, 51.8% of people mentioned behavior management techniques and 31.8% mentioned spending more time with the child. For children with autism spectrum disorder, 41.2% of participants suggested reading about behavior management techniques and 15.6% suggested children were required to enroll in care centers. In the case of a child with separation anxiety disorder, 57.5% of participants suggested reading about how to behave with the affected child and 35% of people suggested setting limits when facing this problem.

Parents were required to answer the question "Is it important to seek professional help to solve the problem?". if the answer is yes, they should state the type of professional help. 68.7% of the respondents stated that the parents of a child with hyperactivity should seek professional help, 60% of people, a psychologist, 41.2% a pediatrician or a family doctor, 24.3% a psychiatrist, and 16.2% chose behavioral sciences specialists. 81.2% of people considered it essential to benefit from professional help for parents of children with autism spectrum. Among the parents who considered professional help necessary, 53% of them chose pediatricians or family doctors, 31.5% chose psychologists, 30.2% psychiatrists, and 26.9% selected behavioral science specialists. 60% of the participants did not consider it necessary to get professional help for the treatment of separation anxiety disorder. On the other hand, among those who mentioned the necessity of professional help, 42.1% considered a psychologist, 39.7 psychiatrist, 26.5% a behavioral science expert, and 14% considered a pediatrician or a family doctor suitable for this task (table 3).

**Table 3**. Source of professional help

| Seeking Professional Help for Child-Related Problems | | | | Percentage |
|---|---|---|---|---|
| Hyperactivity | | | | 68.7% Yes, 31.3% No |
| Autism Spectrum | | | | 81.2% Yes, 18.8% No |
| Separation Anxiety Disorder | | | | 60% No, 40% Yes |
| Professional help | Psychologist | pediatrician | psychiatrist | specialist |
| Hyperactivity | 60% | 41.2% | 24.3% | 16.2% |
| Autism spectrum | 31.5% | 53% | 30.2% | 26.9% |
| separation anxiety disorder | 41.2% | 14% | 39.7% | 26.5% |



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Participants were required to answer the question "What sources do you use to discover information about your child's problem?" Responses for all three types of disorders included mental health websites, the public library, self-help books, and consulting with parents with similar experiences. In general, the respondents stated that regarding all three types of disorders, parents can obtain the necessary information from mental health websites or consult with parents with similar experiences.

Parents were asked to express their perceptions of their child's strengths and weaknesses. 53.1% reported problems related to emotions, concentration, behavior, and how to compromise with others and assessed the severity of these problems as minor (38.1%), moderate (10.6%), and severe (2%). In terms of the amount of hardship and burden that the families of these children bear, people either reported none (37.6%) or a small amount (42.3%) of hardship and pressure. Also, disruption in daily activities caused by these problems was reported to a low extent at home (42.3%), among friends (27%) and leisure time (22.3%). These problems got the highest rank with the child's learning rate. In general, parents' ratings of their children's strengths and weaknesses in all areas, including emotional problems, behavioral problems, hyperactivity, peer problems, and pro-social behavior were reported to be close to the average. While using the grouping suggested by the authors of the strengths and weaknesses questionnaire, the scores for all the subscales were in the "close to average" range; Several subscales had means that were at the lower end of the range or slightly outside the specified range, indicating minor problems in these areas. These sections included emotional problems (M ¼ 1.99), hyperactivity (M ¼ 4.28), and prosocial behavior problems (M ¼ 6.96). Most of the minor items were not perceived as problems, but almost 60% of parents scored one problem item on the emotional problems scale (worried, loss of self-confidence) and three items on the hyperactivity scale (restless, hyperactive, inability to be still, distracted, unable to concentrate) answered "somewhat true" and "completely true" (Table 4).



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**Table 4**. Parent's perceptions of their child's strengths and difficulties

| Parent's perceptions of their child's strengths and difficulties | Percentage |
|---|---|
| Reported problems related to emotions, concentration, behavior, and how to compromise with others | 53.1% |
| The severity of the problems | Minor (38.1%), Moderate (10.6%), Severe (2%) |
| Hardship and burden that the families bear | None (37.6%), Small amount (42.3%) |
| Disruption in daily activities caused by these problems | Home (42.3%), Friends (27%), Leisure time (22.3%) |
| Child's learning rate | Highest rank |
| Ratings of children's strengths and weaknesses | Close to average |
| Subscales with means at the lower end of the range or slightly outside the specified range | Emotional problems (M ¼ 1.99), Hyperactivity (M ¼ 4.28), Prosocial behavior problems (M ¼ 6.96) |
| Percentage of parents who scored one problem item on the emotional problems scale | Almost 60% |
| Percentage of parents who scored three problem items on the hyperactivity scale | Almost 60% |

The scores of the parents' electronic health literacy questionnaire was divided into two groups: high electronic mental health literacy (≥30) and low electronic mental health literacy (<30) compared to the average (M= 30.79, SD=5.273). Regarding hyperactivity disorder, more parents with low E-Mental health literacy (38%) than parents with high E-Mental health literacy (42.1%) were able to correctly diagnose this disorder. Regarding the causes of hyperactivity disorder, parents with higher knowledge consider genetic factors (46.5%) as the main cause, While the main causes of this disorder were considered to be poor discipline (42.1%) and genetic factors (28.5%), parents with less knowledge were also considered as one of the main causes. Regarding the required actions, 52% of the group with high E-Mental health literacy and 38% of the group with less literacy suggested behavior management techniques. Parents with high E-Mental health literacy, compared to parents with low E-Mental health literacy, emphasized more on spending time with their children (low: 20%, high: 39%). Regarding the necessity of professional help, parents with more knowledge (68%) compared to parents with less knowledge (46%) emphasized the benefit of professional help and both groups suggested psychologists and pediatricians for professional help. More than 50% of parents with high electronic mental health literacy and 30% of parents with low literacy recommended receiving information from mental health websites. In addition to the sources mentioned parents with low literacy were more willing to consult with parents with similar experiences (see Figure 1).



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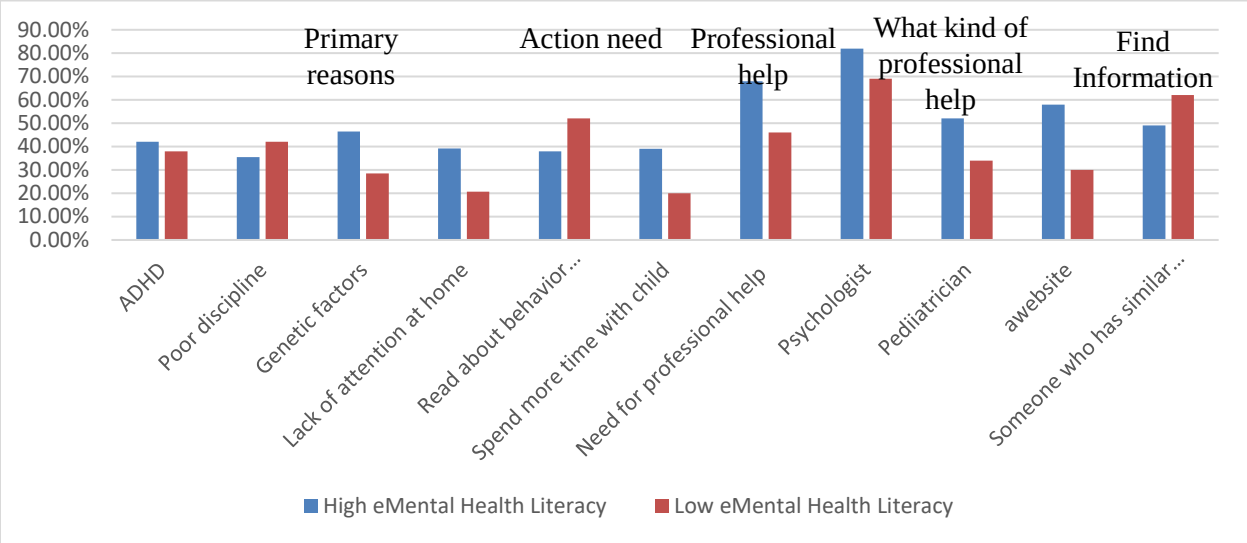


**Fig. 1.** ADHD

Regarding autism spectrum disorders, 62% of parents with high E-Mental health literacy and 30% of parents with low E-Mental health literacy were able to correctly identify this disorder and stated the main cause of this disorder as genetic factors. Regarding the required actions, more parents with high E-Mental health literacy (79%) compared to parents with low E-Mental health literacy (45%) suggested studying behavior control techniques. Regarding professional help, both groups with high (77%) and low (63%) knowledge first suggested a pediatrician for professional help, but the results were slightly different and parents with high E-Mental health literacy (22.1 percent) compared to parents with low E-Mental health literacy (5.8 percent) chose a psychologist as a source for professional help. More than 40% of people in both groups preferred websites and consultations with parents with similar experiences in order to obtain information (see Figure 2).



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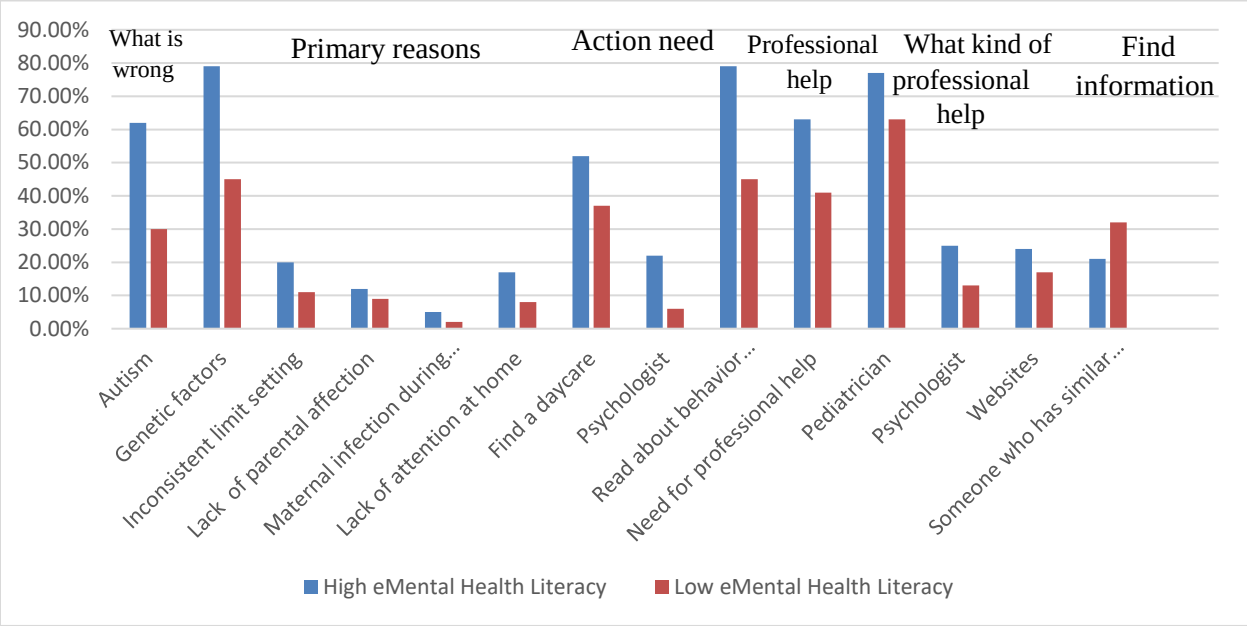


**Fig. 2**. Autism Spectrum Disorder

In relation to separation anxiety disorder, almost 45% of people in both groups mistakenly considered the child to have the disorder, and both groups considered poor adaptive skills as the main cause (high: 59.2%, low: 47%). After that, the creation of contradictory restrictions (high: 16.8%, low: 16.2%) was stated as the cause of children suffering from this disorder. Regarding the necessary actions, behavior management techniques had the highest score among the parents of both groups. 17% of participants with low literacy compared to participants with high literacy (11%) suggested bringing toys to childcare centers as a solution to this problem. More than half of the participants of both groups did not consider it necessary to use professional help in this field, and 20% of the people of both groups suggested websites and consulting with parents with similar experiences as their main source for obtaining information (see Figure 3).



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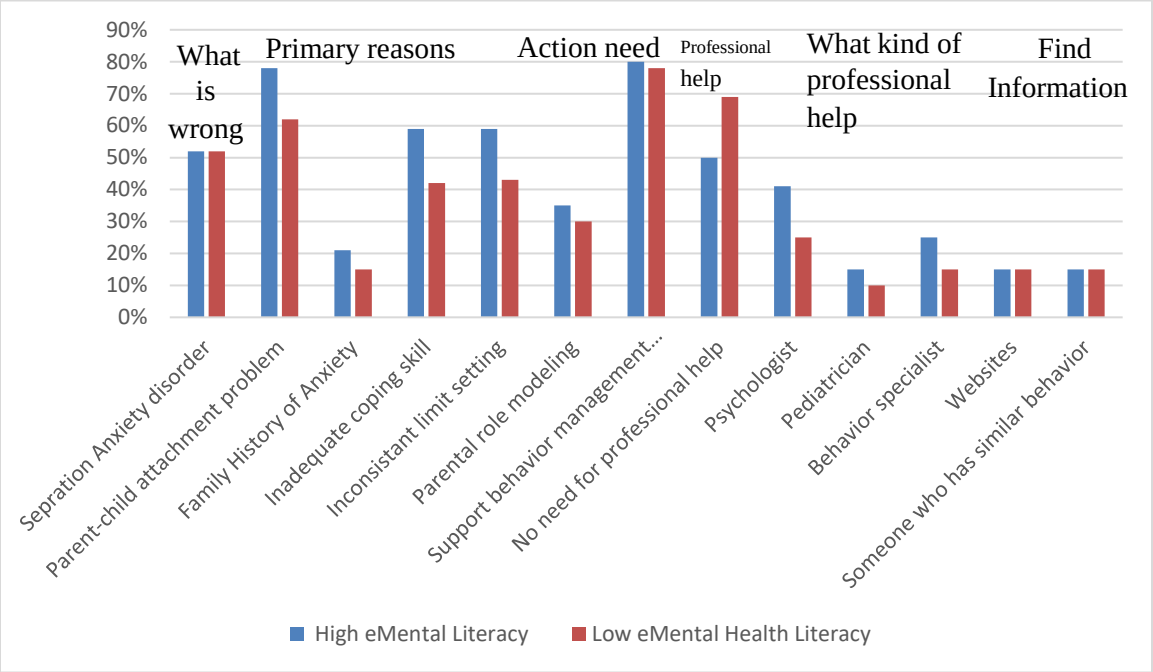


**Fig. 3**. Separation Anxiety Disorder

The scores of the participants in the questionnaire of strengths and weaknesses for their children, who were in the range of 2-5 years, were grouped as follows: "close to the average (0-12 points)", "relatively high (15-13 points), "high (16-18 points)", "very high (40-19 points)". When the scores of all four groups were compared with the two groups of high and low E-Mental health literacy, a higher proportion of children of parents with low E-literacy were at risk of high (1.29%) and very high (3.12%) rates of mental health disorders compared to children of parents with high e-literacy. In general, parents with high e-literacy (42.1%) scored relatively high on the questionnaire of strengths and weaknesses compared to parents with low E-literacy (24.8%) (see Figure 4).



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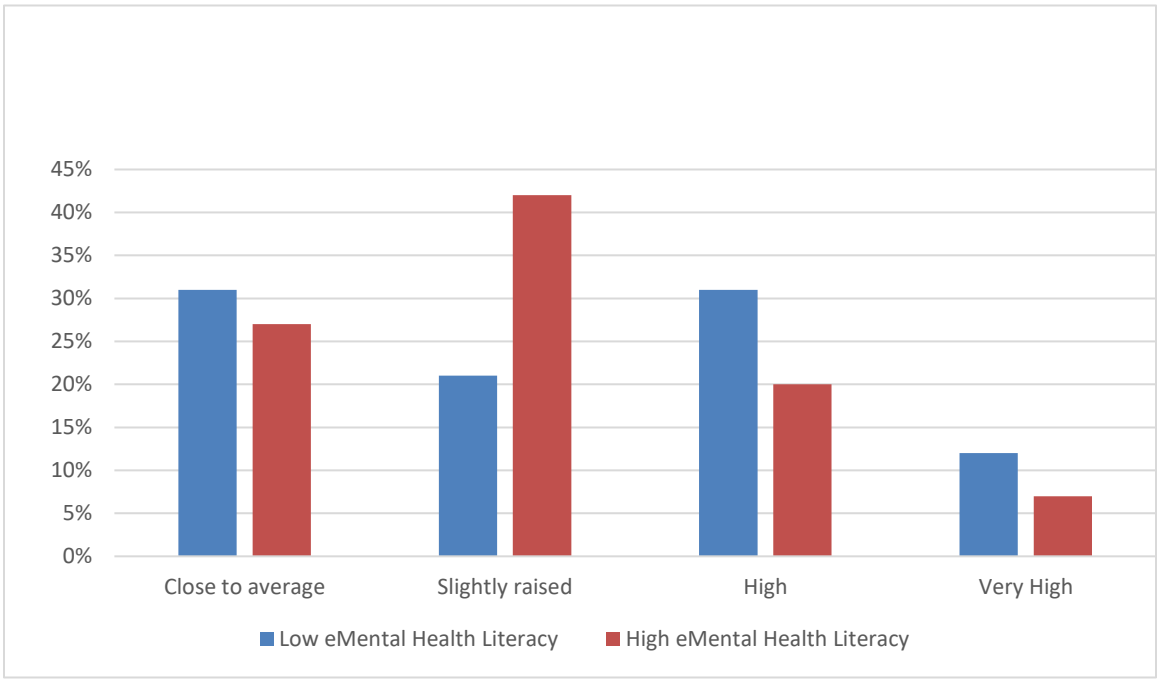


**Fig. 4**. Relationships between Parent's level of e-Mental Health literacy and child's Risk of Diagnosis of a Mental Health Disorder

## Discussion

With the increasing use of the Internet, health e-literacy has become a critical issue, so many people, including parents with young children, use the Internet to search for information related to mental health. This research examined the following:

1) Electronic mental health literacy of parents of preschool children

2) Parents' knowledge of common mental disorders

3) Parents' view of their children's strengths and weaknesses

4) The relationship between the level of electronic mental health literacy of parents (high and low) and their knowledge about common mental disorders and the likelihood of their children suffering from mental health disorders.

First key concept that was mentioned, in order to evaluate the electronic mental health literacy of parents of preschool children, the electronic mental health literacy questionnaire was used. The mean of parents' E- health literacy was 20.89 (out of 40 scores). Similar to the findings of the present study, (Kasparian et al., 2017), tested the E-Mental health literacy of 132 parents of



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children with congenital heart defects in Australia and reported an average E-Mental health literacy of 27.46, which was significantly low, Particularly, having access to the resources available on the internet and being able to distinguish between high-quality sources in the field of health and wellness is ranked low.

The second issue that was examined in this research is related to parents' level of awareness about attention deficit and hyperactivity disorder which was higher than autism spectrum disorder and separation anxiety disorder. The parent's ability to recognize the symptoms of a child's mental health disorders and to know about treatment options plays a key role in making the decision to consult a psychiatrist or other mental health professionals (Abera et al, 2015). The results of this research advised parents to distinguish between different types of mental health problems attention deficit hyperactivity disorder and autism spectrum disorder. The results showed that 68.7% of parents of children with attention deficit hyperactivity disorder and 81.2% of parents of children with autism spectrum disorder need to benefit from professional help. On the other hand, 60% of the participants did not consider professional help necessary to cope with the symptoms of separation anxiety. In relation to attention deficit and hyperactivity disorder, a specialist in behavioral sciences and a pediatrician or a family doctor were preferred for autism spectrum disorder. In the research of Pescosolido et al., (2008), children's depression was estimated to be more serious and the probability of its improvement was less than that of attention deficit hyperactivity disorder. The research done by Johnston and Burke, (2019), showed that considering parents' behavior problems and requests regarding disruptive behavioral disorders properly and briefly, ignoring biological effects, and interpreting these behaviors deliberately and controllably in a way that parents blame themselves for their child's problems, reduces parental involvement in treatment. In this research, the parents stated that if there is a problem in this field, they will get help from websites or from people with similar experiences. These results are in line with the findings of previous studies. For example, In Frauenholtz et al's, (2015) research, while parents used the resources available on the Internet (organizational and government websites, blogs) in order to obtain the information, they also referred to family, friends, acquaintances, and colleagues as sources. Also, Hurley et al., (2019), in a systematic review of the mental health literacy of parents and child nurses showed their desire to obtain information through informal sources instead of formal sources such as health professionals. Our findings showed that the Internet is an



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important source of information for parents that they can access. parents have a special desire to obtain information about issues related to their duties and their child's health (Beck et al, 2014). Due to the quality of information that is available online, making decisions based on them raises concerns. Studies of websites related to attention deficit hyperactivity disorder and autism spectrum disorder report that the majority of these websites lack quality measures of health information and fail to mention evidence of supportive interventions (Akram et al, 2008; Grant et al, 2015).

The third key issue is knowing children's strengths and weaknesses during the preschool years which is useful in identifying children who are at risk of suffering from emotional and behavioral problems related to psychiatry (Croft et al, 2015). In this study, parents reported only minor problems that included emotions, concentration, behavior, or compromise with others. Overall scores for strengths and weaknesses were in the moderate range. Although the responses to the individual strengths and weaknesses questionnaire items indicated potential problems, 80% of the participants stated that they did not need mental health services. For example, almost 65% of parents reported that their child was " dependent on parents" in new situations (emotional problems scale) and over 50% described their child as " hyperactive", "unable to stay a long time", "distracted" and "unable to maintain concentration" (Hyperactivity Scale).

Finally, Parents' knowledge about three common child mental health disorders (attention deficit hyperactivity disorder, autism spectrum disorder, and separation anxiety disorder) was compared based on the levels of E-Mental health literacy (low vs. high). Regarding attention deficit hyperactivity disorder, both groups correctly diagnosed this disorder. Parents with more literacy listed genetic factors as the main cause of this disorder, while among parents with low E-Mental health literacy, poor discipline received the highest score. Although several reasons are involved in attention deficit hyperactivity disorder, empirical evidence suggests that this disorder is hereditary (Belanger et al, 2018). In this research, it was found that parents with higher electronic health literacy are more aware of the causes of attention deficit hyperactivity disorder (ADHD) than parents with lower electronic health literacy, but in the case of autism spectrum disorder and separation anxiety disorder, the difference between the two groups was not significant in terms of diagnosing the causes of the disorder. Also, most parents, whether with high or low electronic mental health literacy, correctly diagnosed attention deficit hyperactivity disorder and considered



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genetic factors to be the main causes of this disorder. In contrast, less than 50% in both groups were able to correctly diagnose separation anxiety disorder and 20% indicated that there was no problem. Early diagnosis of separation anxiety disorder is important; because untreated separation anxiety disorder in preschool children is associated with sleep disturbance, interference in social adaptation, school refusal, and the risk of developing anxiety disorders and depression in childhood and adolescence (Mayer-Brien et al., 2017). In addition, the evidence stated that in families where the transmission of separation anxiety disorder is primarily genetic, the probability of having this disorder in the family increases. Early cognitive-behavioral intervention can reduce some of the long-term consequences of untreated anxiety symptoms during the preschool years (Warwick et al., 2017). In relation to self-care interventions and the need for professional help, a high percentage of parents with high E-Mental health literacy answered "yes" to the need for professional help for autism spectrum disorder, attention deficit hyperactivity disorder, and separation anxiety disorder. In addition, parents who had high E-Mental health literacy were more likely to recommend a behavioral science specialist for attention deficit hyperactivity disorder, a pediatrician for autism spectrum disorder, and a psychologist for separation anxiety disorder. Also, their access to available resources and studies on how to manage behavioral problems in all three disorders was high. Most likely, in relation to attention deficit hyperactivity disorder and autism spectrum disorder, parents consult with a person who has a similar experience. These findings are consistent with the studies of Mendenhall's (2012), on parental behavioral disorders. Parents who have a better understanding of major depression and bipolar disorders benefit from more and better-quality services. Valid experimental models of mental health literacy, based on evidence, stated that a better understanding of mental health disorders, in general, is a suitable indicator for identifying treatment options and also confirms the need to consult an expert (Jorm et al, 1997). According to Mendenhall and Frauenholtz, (2015)., increasing the level of mental health literacy among parents increases their knowledge and the use of appropriate treatment, which leads to the improvement of conditions for affected children. Also, the child's risk of mental health disorders was investigated based on the level of electronic mental health literacy of the parents. Children of parents with low E-Mental health literacy are likely at high or very high risk of developing mental health disorders compared to children of parents with higher literacy. In general, these findings are consistent with previous studies on health literacy which found that low health literacy in parents



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is associated with poor preventive care behaviors, lack of ability to seek the right treatment, and poor child health outcomes (DeWalt & Hink, 2009; Sanders et al, 2009). Also, low mental health literacy about mental health disorders is considered one of the causes of delay in diagnosis and reduced effectiveness of treatment (Mendenhall & Frauenholtz, 2015). Frauenholtz et al., (2015), stated that parents who have limited knowledge about the risk factors associated with developing a mental disorder are less likely to seek professional help. Efforts to educate parents about risk indicators can help prevent the spread of mental disorders among children. This assistance is done through early interventions to identify and support children who are more susceptible to the disease.

**Limitations**

In this research, in particular, the quality of information was a concern. It is possible that the participants did not pay enough attention to the survey questions. Other limitations are the cross-sectional design, the use of hypothetical statements, and those statements that were chosen by the participants themselves, which can harm the quality of the data. Finally, stating "mental health" information instead of "health" information in the electronic mental health literacy questionnaire is another effective limitation of this research.

**Conclusions and implications for practice**

This research showed that the parents' use of the Internet is high and their electronic mental health literacy is also high, but their knowledge about common mental health disorders, which includes knowing the symptoms and the ability to correctly identify the options for help, is low. Parents with higher electronic health literacy are more likely to actively seek information on how to manage behavioral problems and support professional help than parents with lower electronic health literacy. The results of this research emphasize the need to educate parents regarding children's mental health disorders to help them diagnose serious problems because identifying the problem is a fundamental step in the process of child participation in mental health services, reducing distress and dysfunction and preventing possible harm in the future. More knowledge about the genetic and neurobiological factors that underlie common disorders in children will reduce the possibility of any erroneous conclusions about whether these symptoms are real disorders and not just a product of poor upbringing. The results of this research can be used to inform educational administrators about using online resources and identifying child disorders to



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promote early intervention. In particular, parents with low E-Mental health literacy, who are not aware of the possibility of their children having mental health disorders and delay seeking professional help, can benefit from education on how to prevent the spread of these disorders. Guidance is informed by new empirical evidence, disseminated, and distributed to parents, daycare centers, preschools, and other child-serving organizations.

### Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

### Ethics statement

The studies involving human participants were reviewed and approved by ethics committee of Farhangian University. The patients/participants provided their written informed consent to participate in this study.

### Author contributions

AR and MS contributed to the study conception and design, material preparation, data collection and analysis. All authors contributed to the article and approved the submitted version.

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### Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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