



Board game for children with autism: developing autonomy and social skills

Jogo de tabuleiro para crianças com autismo: desenvolvendo autonomia e habilidades sociais

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ABSTRACT

This is a methodological study that aimed to develop a board game to develop autonomy and social skills in children with autism. The game's development was supported by the toy library of the *Hospital Universitário Júlio Bandeira* [Julio Bandeira University Hospital]. Models were collected through an integrative review and an interview with mothers of autistic children. The game was based on methods extracted from articles, from the *Picture Exchange Communication System*, *Social Stories*, and the difficulties encountered during the interview. It has a board with 32 squares, 22 cards (three different models), one die, and small cars used to advance through the squares on the board. Due to their playful nature, board games have the potential to be used by children with autism to develop autonomy and social skills. It was concluded that the production of care-educational technologies aimed at the autistic public is essential for cognitive and social development.

Keywords: Child. Child Development. Social Skills. Experimental Games. Autism Spectrum Disorder.

RESUMO

Trata-se de estudo metodológico que objetivou elaborar um jogo de tabuleiro para desenvolver a autonomia e as habilidades sociais nas crianças com autismo. A produção do jogo contou com o apoio da brinquedoteca do Hospital Universitário Júlio Bandeira. Captaram-se modelos mediante uma revisão integrativa e uma entrevista com mães de crianças autistas. O jogo se baseou nos métodos extraídos dos artigos, no *Picture Exchange Communication System*, nas *Histórias Sociais* e nas dificuldades encontradas na entrevista. Ele conta com um tabuleiro de 32 casas, 22 cartas (3 modelos diferentes), 1 dado e carrinhos utilizados para avançar as casas do tabuleiro. Devido ao seu caráter lúdico, os jogos de tabuleiro têm potencial de ser usados por crianças com autismo para desenvolver a autonomia e habilidades sociais. Concluiu-se que a produção de tecnologias cuidativo-educacionais voltadas para o público autista é fundamental para o desenvolvimento cognitivo e social.

Palavras-chave: Criança. Desenvolvimento infantil. Habilidades Sociais. Jogos Experimentais. Transtorno do Espectro Autista.

Received in June 13, 2022
Accepted on August 10, 2022

INTRODUCTION

Autism spectrum disorder (ASD) is a neurodevelopmental disorder that directly affects social interaction, behavioral manifestations, and communication¹. Children with ASD have several impairments in their autonomy; normally, they have difficulty speaking, relating to other people, and performing basic activities of self-care, such as brushing their teeth, bathing, dressing themselves, and cutting their nails².

However, it is worth stressing that it is not correct to generalize these signs and symptoms to all children with autism. The spectrum includes individuals with different signs and symptoms, which makes it inappropriate to approach autism in a singular manner. Therefore, it is essential to know this heterogeneity, especially in recent years, in which the prevalence of this condition has been increasing substantially³.

Over time, changes in the diagnosis of ASD, made by the Diagnostic and Statistical Manual of Mental Disorders, have contributed to the increase in this prevalence. It is estimated that, within the last 30 years, there has been a 20-fold increase in this rate. A study conducted in the United States of America (USA) showed that cases of ASD increased by 175% between the years 2000 and 2016⁴. Although epidemiological data is scarce in developing countries, a 2017 study conducted in the metropolitan regions of Goiânia, Fortaleza, Belo Horizonte, and Manaus, found a prevalence of 1% (similar to the global estimate) in children and adolescents up to 16 years old⁵.

In this sense, creating care-educational technologies (CETs) for children with ASD can be relevant for health promotion and for developing children's autonomy in this target audience. In childhood, health promotion aids development by providing sensitive and complete monitoring and intervention in the child's environment⁶.

As for the development of children's autonomy, this is seen when pedagogical methods are applied, as well as when the mediators - those who perform them - instigate learning by triggering in the child a reflection on the rules of coexistence that guide society, with seriousness and humanization⁷. Thus, it is essential that parents also participate in this process, since the first moral and ethical values are conveyed within the family.

It is worth pointing out that technologies are not necessarily products: they can also be tools or methods that seek to provide a certain outcome. CETs emerge in this scenario, which are tools in which the care process is directly linked to teaching, as well as to the development of autonomy. In other words, the target audience of these technologies, besides being benefited by care, can develop the ability to perform self-care⁸.

Therefore, it is appropriate to consider CETs aimed at children who have this highly prevalent disorder, since such technologies can aim to stimulate autonomy and mitigate social deficits. To this end, it is valid that the technology, in addition to providing care and teaching, also aims to be ludic. Thus, the use of games stands out. Studies have shown that games are more effective than conventional interventions and teaching methods⁹.

Among the different types of games that can be used as intervention, the board game is the easiest, as its construction is cheaper and faster when compared to digital games. Another relevant factor is that this type of game does not require digital devices to be deployed, and this facilitates the access and inclusion of different populations to CETs¹⁰.

Furthermore, board games contribute significantly to awaken the individual's cognitive development by encouraging companionship and affinity among participants, as well as to develop concentration and strategy skills¹¹.

Thus, the approached theme is of great importance for promoting the health of the target population, providing means to develop independence and self-control of emotions, promoting considerable improvements in the quality of life of these individuals and of the people around them. Thus, we aimed to develop a board game to develop autonomy and social skills in children with autism.

METHODOLOGY

This was a methodological study, with emphasis on the elaboration of a care-educational technology (CET) - board game - to develop autonomy in the teaching-learning process and promote improvements in quality of life. This type of study investigates, structures, and analyzes data to build, validate, and evaluate research instruments and techniques, and is ideal for the development of instruments such as the educational game. Researchers, when conducting methodological research, are interested in transforming the knowledge they build into something tangible¹².

The production of the CET occurred in the Laboratório de Tecnologias de Informação e Comunicação em Saúde (LATICS) [Laboratory of Information and Communication Technology in Health] of the Universidade Federal de Campina Grande (UFCG), Cajazeiras campus, state of Paraíba (PB), in partnership with the Julio Bandeira University Hospital's (HUJB) toy library and the psychopedagogue of that institution.

This study had the following phases: collection of content to compose the board game - at this point, the scientific material that fit the criteria established for this study was identified; selection of the content for the production of the drawings and texts of the cards and their scores, the board, and the rules of the game - the

material for the production of the technology was also selected; gathering of game models for the selection of the one that best met the objective of this study; and production of the CET.

Thus, a survey of game models was done through an integrative review of the literature on the subject; clinical trials conducted with children who had ASD were also included. The game used in the intervention could either be digital or not, and it had to be a controlled study. The search was conducted in five databases. MEDLINE, LILACS, and Cochrane were chosen for being health-related databases. However, due to the lack of studies on the subject in databases exclusive to the health area, Web of Science and Embase were also included for having more multidisciplinary content. The search strategy (put into practice on June 2, 2021) is shown in Table 1, along with the databases.

Chart 1 - Search strategies used in each database

DATABASES	SEARCH STRATEGY
MEDLINE	<p>#1 "Autism Spectrum Disorder"[Mesh] OR (Autism Spectrum Disorders) OR (Autistic Spectrum Disorder) OR (Autistic Spectrum Disorders) OR (Disorder, Autistic Spectrum)</p> <p>#2 "Play and Playthings"[Mesh] OR (Playthings and Play) OR (Toys) OR (Toy) OR (Play) OR (Plays) OR (Playthings) OR (Plaything)</p> <p>#3 "Games, Experimental"[Mesh] OR (Game, Experimental) OR (Experimental Game) OR (Experimental Games)</p> <p>#4 "Games, Recreational"[Mesh] OR (Game, Recreational) OR (Recreational Game) OR (Recreational Games)</p> <p>#5 "Social Skills"[Mesh] OR (Skill, Social) OR (Skills, Social) OR (Social Skill) OR (Social Abilities) OR (Abilities, Social) OR (Ability, Social) OR (Social Ability) OR (Interpersonal Skills) OR (Interpersonal Skill) OR (Skill, Interpersonal) OR (Skills, Interpersonal) OR (Social Competence) OR (Competence, Social)</p> <p>#6 = #2 OR #3 OR #4</p> <p>#1 AND #6 AND #5</p>
Embase	<p>#1 'autism'/exp</p> <p>#2 'recreation'/exp</p> <p>#3 'game'/exp</p> <p>#4 'social competence'/exp</p> <p>#5 = #2 OR #3</p> <p>#1 AND #5 AND #4</p>
Cochrane	<p>#1 MeSH descriptor: [Autism Spectrum Disorder] explode all trees</p> <p>#2 MeSH descriptor: [Play and Playthings] explode all trees</p> <p>#3 MeSH descriptor: [Games, Experimental] explode all trees</p> <p>#4 MeSH descriptor: [Games, Recreational] explode all trees</p> <p>#5 MeSH descriptor: [Social Skills] explode all trees</p> <p>#6 = #2 OR #3 OR #4</p> <p>#1 AND #6 AND #5</p>
LILACS	<p>#1 MH:"Transtorno do Espectro Autista" OR (Transtorno de Espectro Autista) OR (Transtorno do Espectro do Autismo) OR (Autism Spectrum Disorder) OR (Trastorno del Espectro Autista) OR (Trouble du spectre autistique) OR MH:F03.625.164.113</p> <p>#2 MH:"Jogos e Brinquedos" OR (Play and Playthings) OR (Juego e Implementos de Juego) OR (Jeu et accessoires de jeu) OR MH:I03.450.642.693</p> <p>#3 MH:"Jogos Experimentais" OR (Games, Experimental) OR (Juegos Experimentales) OR (Jeu expérimental) OR MH:E05.385</p> <p>#4 MH:"Jogos Recreativos" OR (Games, Recreational) OR (Juegos Recreacionales) OR (Jeux récréatifs) OR MH: I03.450.642.693.465</p> <p>#5 MH:"Habilidades Sociais" OR (Social Skills) OR (Habilidades Sociales) OR (Compétences sociales) OR MH: F01.145.813.828 OR MH: F01.829.401.737</p> <p>#6 = #2 OR #3 OR #4</p> <p>#1 AND #6 AND #5</p>
Web of Science	<p>#1 TS=Autism Spectrum Disorder</p> <p>#2 TS=Games, Experimental</p> <p>#3 TS=Games, Recreational</p> <p>#4 TS=Social Skills</p> <p>#5 = #2 OR #3</p> <p>#1 AND #5 AND #4</p>

Source: Prepared by the authors (2022).

To understand the difficulties faced by individuals with ASD who would use the game, an interview was conducted with mothers of autistic children from the *Associação de Pais e Amigos do Autista de Cajazeiras e Região Circunvizinha* (APAA) [Association of Parents and Friends of the Autistic of Cajazeiras and Surrounding Region] - children who also attended the HUIB toy library. Due to the 2019 coronavirus pandemic (COVID-19), this interview took place through Google Forms. On the first page, the mother wrote her name, the child's name, and the age of her child. On the next page, she answered three questions: "What are the main difficulties faced by your child on a daily basis? Which school subjects does he/she have the most difficulty with? What are the main difficulties he/she faces at school?". To maintain the children's privacy, their names were replaced by the word "CHILD" followed by a cardinal numeral (CHILD 1, CHILD 2...). For cards and game board elaboration, the Canva website was used, which can be found at the following electronic address: www.canva.com.

Regarding the ethical aspects, the project was submitted to the Research Ethics Committee of the Universidade Federal de Campina Grande (UFCG) and was approved under Opinion No. 4.327.731. All research participants were informed about the character of the study, its objectives, free consent, data confidentiality, as well as the right to decline participation at any time during the research, without prejudice or damage.

RESULTS

After applying the eligibility criteria, three articles were selected to support the construction of the game, whose titles are: 1) Randomized Controlled Trial of a Video Gaming-Based Social Skills Program for Children on the Autism

Spectrum; 2) A trial of an iPad intervention targeting social communication skills in children with autism; 3) GOLIAH (Gaming Open Library for Intervention in Autism at Home): a 6-month single blind matched controlled exploratory study¹³⁻¹⁵. Added to this, was the use of the Social Stories (SS) methodology and the Picture Exchange Communication System (PECS). In this sense, four types of cards were contemplated: "question card", "answer card", a "yes card", and a "no card". After selecting the base models for the construction of the game, a survey of the main difficulties faced by mothers or guardians of autistic children from the APAA was carried out.

In total, 25 mothers participated in this association, although only 12 took part in the research. All children were male, and the age ranged from 3 to 11 years, with a mean of 7 years. It was identified that most children had difficulties with daily activities (Table 1). Therefore, the game was designed with the primary aim of alleviating the daily difficulties experienced by these children and their guardians.

Table 1. Summary of the main difficulties faced by autistic children from the APAA — Cajazeiras, PB, 2022

Child	Age	Main day-to-day difficulties	School subjects with greater difficulty	Main difficulties at school
CHILD 1	5	Bathing, eating at the right times, cutting nails	Mathematics, Portuguese/Writing, Science, History/Geography	Did not answer
CHILD 2	7	Brushing teeth, cleaning after defecating, eating at the right times, cutting nails	Mathematics, Science, History/Geography	Did not answer
CHILD 3	11	Bathing, brushing teeth, cleaning after defecating, cutting nails	Mathematics, Portuguese/Writing, Science, History/Geography	Did not specify
CHILD 4	7	Brushing teeth, cleaning after defecating, cutting nails	Mathematics, Science, History/Geography	Socializing
CHILD 5	3	Did not answer		Did not answer
CHILD 6	3	Brushing teeth, cleaning after defecating, cutting nails		Did not answer
CHILD 7	3	Did not answer		Did not answer
CHILD 8	5	Bathing, eating at the right times	Mathematics, Portuguese/Writing, Science, History/Geography	Did not specify
CHILD 9	10	Bathing, brushing teeth, cutting nails		
CHILD 10	11	Cleaning after defecating, eating at the correct times, cutting nails	Mathematics	Socializing
CHILD 11	9	Bathing, brushing teeth, cleaning after defecating, eating at the correct times, cutting nails	Mathematics, Portuguese/Writing, Science, History/Geography	Did not answer
CHILD 12	11	Bathing, brushing teeth, cleaning after defecating, eating at the correct times, cutting nails	Mathematics, Portuguese/Writing, Science, History/Geography	Did not specify

Source: Prepared by the authors (2022).

Regarding the game, the “question card” will be used to ask a certain question to the child with ASD about the behavior intended to be taught/changed; the “answer card” will be used to clarify the answer of the previous card, with the aim of teaching the child how a certain behavior/action should occur; the “yes card” and the “no card” will be used for answering the questions asked. In all, ten “question cards”, ten “answer cards”, one “yes card”, and one “no card” were produced.

All cards have illustrations focused on the theme, a device often used in SS and PECS. In the “answer card”, PECS illustrations were used with the children of the APAA, as they are already

familiar with the images in these cards. In addition, the sentences are simple and straightforward, as is also the case in SS. The illustrations serve to facilitate the child’s understanding of the subject being presented. Added to this, there was a decision to place numbers on the back of the “question cards” and “answer cards”, because mathematics was cited by all the mothers as a subject their children have more difficulties with. The card models are presented in the following figures.

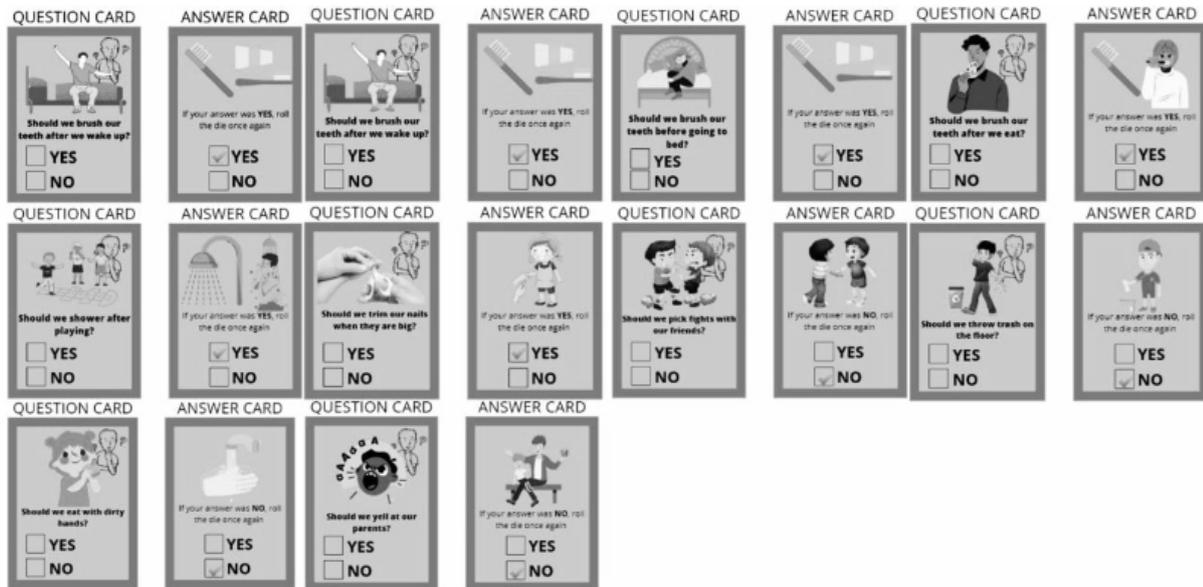


Figure 1. Front side of the “Question Cards” and “Answer Cards”. Prepared by the authors (2022).

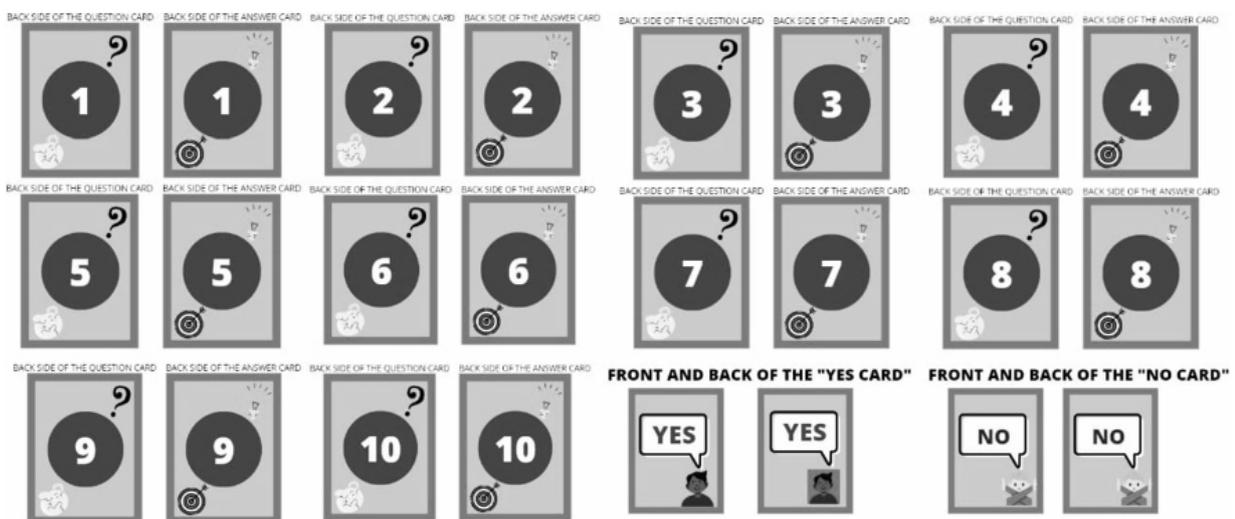


Figure 2. Back side of the “Question Cards” and “Answer Cards”. Prepared by the authors (2022).

The board is made up of 32 squares, 10 of which are “question squares”; 20 squares are entitled “Pass your turn” (in these, there is an image of a boy passing the die to a girl); and a “Congratulations!” square. These 32 squares were chosen to develop participants’ patience and interpersonal relationships, as well as autonomy.

In the “Pass your turn” squares, for example, an image in which a boy hands a girl a die was chosen to stimulate communication between the players. The advancement through the squares is based on the result of rolling the die, and small cars are used to advance them.

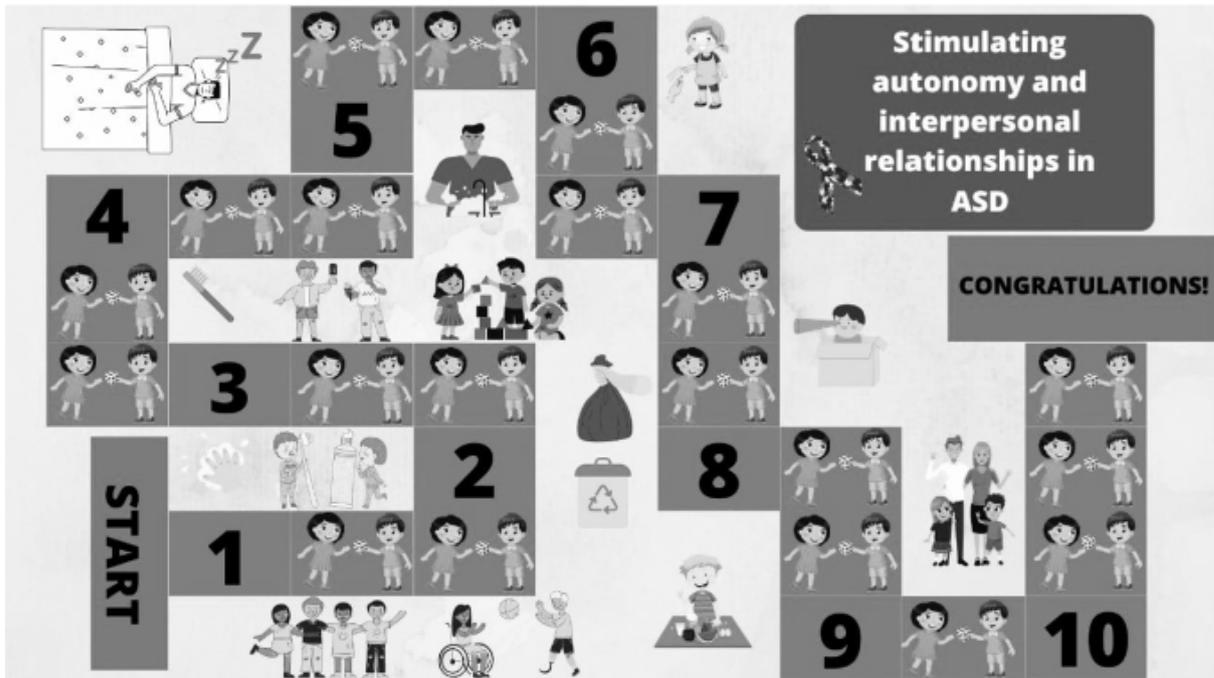


Figure 3. Game Board.

Prepared by the authors (2022).

Board game stages and rules

The board game takes place in two stages: training and competition. The first stage will be the one in which the children will be able to learn how to play the game; therefore, the participation of parents/guardians and another adult is favorable. The second stage will be the game itself, in which there will be a board, the cards from the models mentioned above, and the die.

Training

This stage of the game requires the participation of the children's parents/guardians and another adult (moderator), with whom the child will communicate. It is advisable for parents to have a toy or object that the child likes, which will be used as a reward for each step completed by the child.

At first, the moderator will ask the child to throw the die and advance the number of squares corresponding to the result. When doing so, the

child, with the help of the moderator, must note whether he landed on a "question square" or on a "Pass your turn" square. Depending on the square, the moderator will ask the child to choose one of the "question cards", which will have its back exposed (only the back of the card will be showing with their respective numbers) and hand it to the adult, who will read the question. Next, he should ask whether the answer is "yes" or "no".

To answer, the child can either take the "yes card" or the "no card" and hand it to the adult, or he can also vocalize the answer, the first option being used with children who have greater communication difficulties. It should be emphasized that, if the child is able to vocalize the answer and simultaneously pick up the card and hand it to the adult, it is essential that he/she is encouraged to do so. After that, if the child answered correctly, the parents should give him/her the toy and/or object used as a reward and let them play for a few minutes. On the other hand, if the answer is wrong, they should guide the child to choose the "answer card" with the same number on its back side as the "question

card". This is a way of teaching such children to recognize numbers and, therefore, to work on math-related deficits.

In this way, based on the child's choice of "answer card", the parents/guardians should explain to them the certain behavior or daily activity being addressed using the illustrations available on the card. However, it is worth mentioning that, even if the child has answered correctly, the parents can use the "answer card" to explain something they want to add to that activity/behavior; and/or teach them to form pairs of the numbers on the back of the cards, since the "answer card" has the same number on its back side than the "question card".

Parents will be able to help children in any of these stages of the proposed training, and there is no exact training time since each child with ASD has its own peculiarities. However, parental participation is essential in all stages.

Finally, the child will be ready to play the next stage of the game when he or she has the autonomy to choose a "question card", hand it over to the adult, choose a "yes card" or a "no card", and deliver the "answer card" to the adult or vocalize the response. Even if they provide incorrect answers, they will be ready to start the board game, in which the choice of the correct answer can be worked on.

Competition

At this stage, two or three children who have gone through the training stage will be able to play the board game. Initially, each participant must roll the die, and the one with the highest score will start the game; in case of a tie, the die is rolled again. With this, the child with the highest score must advance the number of squares corresponding to the number rolled on the die; and, if it lands on a "question square", they must pick up a "question card" and hand it to the adult.

They will, in turn, ask what is on the card. With each correct answer given to a drawn "question card", the child will have the right to throw the die again.

The winner will be the one who reaches the square marked "Congratulations!" first. As a reward, the winner will be allowed to play with the object/toy for an unlimited time and no longer for just a few minutes. However, it is essential that the parents of children who did not win encourage them to play the game until the end, so that the main objective can be achieved: to make the child more autonomous and relate better with other people. If it's the child's first time playing at this stage, it is interesting that the game has only two participants, as this facilitates the child's adherence to the game, since individuals with ASD have difficulties in socializing.

DISCUSSION

At first, the construction of the game had as one of its main objectives the production of an accessible technology. The board was the model chosen because it is a non-digital game and does not need many resources¹⁰. As mentioned above, interviewing the mothers made it possible to learn about the main obstacles experienced daily by both them and their children. Those who answered the last question in the interview reported that their children have difficulty socializing. In fact, this is part of one of the domains affected in children with autism spectrum disorder (ASD): difficulty in maintaining relationships, initiating conversations, and having socio-emotional reciprocity^{3,2,16}.

All children with ASD were male, which outlines, once again, such a predominance regarding this disorder. There are some hypotheses about this difference in sex. The first relates to the fact that females have a higher

capacity to camouflage their symptoms: they have fewer stereotyped movements and a greater ability to socialize. Another hypothesis is that the diagnostic instruments were formulated in such a way as to be more sensitive to diagnose only males, and for girls to reach scores that indicate ASD, they should have more expressive symptoms¹⁷.

In addition to the interview form, the literature review was the basis for the construction of this game. The three articles used games with the aim of improving deficit skills in ASD. The implementation of a stimulus for children to continue to be attracted to the game — in this study, it's the permission for them to play with their favorite toys — was an idea extracted from these articles, which had different positive reinforcements, all aimed at maintaining the playful character combined with teaching¹³⁻¹⁵.

It is also added that the present care-educational technology (CET) used basic concepts of Social Stories (SS) and the Picture Exchange Communication System (PECS). The act of the child choosing a card and handing it to an adult and using the “yes” and “no” cards as a means of response were strategies extracted from the PECS. On the other hand, explanations provided to the children by the parents, using the illustrations, was inspired by both the PECS and SS^{18,19}.

It is noteworthy that the choice for the PECS occurred because it is a technology used with children from the APAA. Furthermore, both the PECS and SS are strategies that have been used for a long time to develop communication, behavior, and social interaction in different countries. Such skills directly influence educational autonomy^{20,21}.

To obtain the desired improvements in the aforementioned skills, the participation of two adults was suggested in the game rules. One of them must be responsible for the child

(one of the parents, for example); and the other, someone from outside the child's social life. Parent participation is extremely important, as studies indicate that children with autism learn better when parents participate in the teaching-learning process²².

Furthermore, this participation is also essential for them to teach the children the rules of the game and skills that their sons or daughters have more difficulty with. Likewise, it is expected that, due to its ludic nature, the relationship between parents and children will improve. Studies report that the difficulty that some infants with ASD have in participating in games ends up harming the well-being of parents, given that many feel that they are not able to make their child have fun, worsening the family relationship²³. Furthermore, playfulness is essential for establishing social relationships between parents and children²⁴.

On the other hand, the participation of an adult who is not from the child's social circle is also relevant. The simple fact that a player who has difficulty initiating a conversation can interact with an unknown person is very positive for progress toward personal and educational autonomy. These stimuli are necessary and should always be the focus of parents and teachers. The importance of this encouragement can be seen in the scientific literature, which indicates that when teachers encourage students with ASD to be more autonomous, there are fewer school problems and significant improvements in subjects²⁵.

Another point worth mentioning are the rules and stages of the game. They are quite simple since children with ASD are more attracted to games with simple and explicit rules²⁶. Furthermore, all the cards and their respective questions are about topics involving the child's daily life, to support the generalization of the skills learned to the everyday environment²⁷.

Despite the suggested standards for

designing interventions with autistic people, it is worth mentioning that people with autism have different signs and symptoms. Therefore, it is interesting that each intervention be planned for each person, or at least for each group of individuals with ASD²⁸. With that in mind, it was suggested in the rules of the present CET that parents could not only participate in the whole process but also use the “answer cards” to explain to the children how a specific daily activity should be performed, as they know more about their individualities.

Indeed, there are several methods used when one wants to apply interventions in individuals with ASD, but those that are individualized seem to be the most effective. This is mainly due to the great heterogeneity present in this spectrum²⁸. Thus, each card in the board game, as well as the choice of placing numbers on their back side, were strategies developed based on the needs presented by the children at APAA.

The place chosen for the application of this game was the HUJB toy library. The construction of the game was assisted by the hospital’s psychopedagogue. In this sense, the importance of the relationship that the child’s family and the child him/herself must have with teachers/pedagogues stands out. In an interview conducted among parents, students with ASD, and teachers, it was noted that the limited communication between the family and the school/teachers brought harm to the students. For example, students whose family was not integrated into the school environment had more difficulties in exercising their autonomy when faced with day-to-day difficulties²⁹. Therefore, the participation of the psychopedagogue in the game development process is justified, as well as in the execution of the interview conducted with the mothers of APAA.

Given the above, this study has a fundamental relevance in the current context,

in which there is an exponential increase in the diagnosis of ASD. When autism is diagnosed in a child, the impact falls on the whole family; and, from then on, the essential role of a multidisciplinary team that aims to mitigate the social and behavioral deficits of the child comes into play. Added to this, there is a need for more means of health promotion, not only for the child but also for the parents/guardians involved³⁰. Thus, this game seeks to unite play and education and, therefore, add one more tool in society to collaborate with this multidisciplinary treatment, specifically for these children participating in the APAA.

As far as the limitations of this article, the low number of mothers interviewed stands out: of the 25 who participate in the association, only 12 answered the questions through the Google platform. This highlights the difficulty of accessing digital tools that many families still have. However, this proposed CET has the potential for very positive results. Studies indicate that children with ASD, with or without intellectual disabilities, do have the ability to improve after well-established and planned interventions. Therefore, it is expected that the application of the rules and stages of this game, as well as the synergistic union between family, teachers/pedagogues, and the child with autism will be a strong stimulus for the development not only of educational autonomy, but also of personal autonomy³¹⁻³⁴.

CONCLUSION

In light of these considerations, it is understood that the construction of this care-educational technology (CET) for children with autism spectrum disorder (ASD) was fundamental. This is mainly due to the potential that such technology has in promoting health

and well-being of children with autism. It is also noteworthy that the game developed in this work focuses on improving autonomy, as well as basic social and individual skills of everyday life. It also aims to promote the maturation of communicative interactions, and the reduction of stress, anxiety, and irritability in autistic children.

Furthermore, it is necessary that the theme in question gains more space in the scientific environment. The justification for this is found, above all, in the increase in the number of ASD diagnoses, the growing insertion of technologies in the daily lives of children, and in the few studies that seek to develop interventions for this target audience, as shown above. Therefore, highlighting this issue is essential to improve future perspectives about interventions for ASD.

ACKNOWLEDGMENT

This work was carried out with support from the *Conselho Nacional de Desenvolvimento Científico e Tecnológico* (CNPq), the *Laboratório de Tecnologias de Informação e Comunicação em Saúde* (LATICS), and the *Universidade Federal de Campina Grande* (UFCG). The scholarship was offered through the Institutional Scientific Initiation Scholarship Program (PIBIC/CNPq-UFCG).

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