


Psico Bot: a robot for psychological assessment of children and adolescents

Psico Bot: um robô na avaliação psicológica de crianças e adolescentes

Psico Bot: un robot para la evaluación psicológica de niños y adolescentes

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Abstract: Chatbots can use fast, and sometimes specialized interactions in different situations, making them an option in the choice of tools to collect information. In the psychological assessment of children and adolescents, they can act as complementary sources, and help to describe, qualify and measure psychological and behavioral characteristics, in its various forms of expression, in different contexts. This study aimed to present Psico Bot, a chatbot developed to assess symptoms of anxiety and depression in children and adolescents. Consisting of 20 questions that map physical and psychological symptoms of the selected constructs, it was developed through the natural language Dialogflow for use in the Google Assistant conversation platform. The design of Psico Bot is based on a neutral representation, with no determined gender or age, facilitating quick identification by the user. Based on the use of multimethod evaluations, the Psico Bot can offer relevant information about the mental health of children and adolescents using language and devices that are easy to understand and handle by this population. For the evaluator, the tool offers quick response and specific information about each construct, enabling more effective interventions in elements of greatest need.

Keywords: mental health; information technologies; mhealth; psychological assessment

Resumo: *Chatbots* podem utilizar-se de interações rápidas, e por vezes, especializada em diferentes situações, tornando-os uma opção na escolha de ferramentas para coletar informações. Na avaliação psicológica de crianças e adolescentes, podem atuar como fontes complementares, e auxiliar a descrever, qualificar e mensurar características psicológicas e comportamentais, nas suas diversas formas de expressão, em diferentes contextos. Este estudo objetivou apresentar o Psico Bot, um *chatbot* desenvolvido para avaliar sintomas de ansiedade e depressão em crianças e adolescentes. Composto por 20 questões que mapeiam sintomas físicos e psicológicos dos constructos selecionados, sendo desenvolvido por meio da linguagem natural Dialogflow para uso na plataforma de conversação Google Assistente, o design do Psico Bot pauta-se em representação neutra, sem sexo ou idade determinados, facilitando a rápida identificação do usuário. Respaldo-se na utilização de multimétodos avaliativos, o Psico Bot pode oferecer informações relevantes sobre a saúde mental de crianças e adolescentes utilizando linguagem e dispositivos de fácil compreensão e manuseio por essa população. Para o avaliador, a ferramenta oferece resposta rápida e informações específicas sobre cada constructo, possibilitando intervenções mais efetivas em elementos de maior necessidade.

Palavras-chave: saúde mental; tecnologias da informação; mhealth; avaliação psicológica



Resumen: Los *chatbots* pueden utilizar interacciones rápidas y, a veces especializadas, en diferentes situaciones, lo que los convierte en una opción en la elección de herramientas para recopilar información. En la evaluación psicológica de niños y adolescentes pueden actuar como fuentes complementarias y ayudar a describir, calificar y medir las características psicológicas y de comportamiento en sus diversas formas de expresión en diferentes contextos. Este estudio tuvo como objetivo presentar Psico Bot, un *chatbot* desarrollado para evaluar síntomas de ansiedad y depresión en niños y adolescentes. Compuesto por 20 preguntas que mapean síntomas físicos y psicológicos de los constructos seleccionados, fue desarrollado mediante el lenguaje natural Dialogflow para su uso en la plataforma de conversación Google Assistant. El diseño de Psico Bot se basa en una representación neutra, sin género ni edad determinados, lo que facilita la rápida identificación por parte del usuario. A partir del uso de evaluaciones multimétodo, Psico Bot puede ofrecer información relevante sobre la salud mental de niños y adolescentes utilizando un lenguaje y dispositivos de fácil comprensión y manejo para esta población. Para el evaluador, la herramienta ofrece una respuesta rápida e información específica sobre cada constructo, lo que permite intervenciones más eficaces en los elementos de mayor necesidad.

Palabras clave: salud mental; tecnologías de la información; mhealth; evaluación psicológica

Psychological assessment

Psychological assessment is defined as a structured process of investigation of psychological phenomena in order to provide information for decision making, based on specific demands. In the individual or group scope, the psychological assessment of children and adolescents occurs in a complex evolutionary period of intense biopsychosocial development. Therefore, in addition to the investigative nature of psychological functioning, it also has a preventive function based on the early recognition of conditions that may bring negative consequences for development (Lins et al., 2018).

Due to such specificity, it requires special attention in the decision of fundamental sources of information, that is, which methods, techniques and tests (scales, inventories, questionnaires and projective/expressive methods), to be used in the assessment procedures. Facing the complexity inherent to the process of psychological assessment in different contexts and at different stages of human development, the use of multimethods of assessment has been recommended (Colombarolli et al., 2022). It is, therefore, the use of two or more techniques and/or instruments during the assessment process, aiming to collect a wider range of information from the subjects being assessed. Its application favors the decision making by the evaluator, since each technique or instrument has potentialities, but also limitations.

The use of multi-methods of psychological assessment has also been recommended in the assessment of similar constructs (Mihura, 2012). Such procedure favors the accuracy and validity of the instruments and techniques, especially the criterion validity category. Furthermore, the combination of techniques with different stimuli, such as verbal and non-verbal, can complement each other, offering the possibility of integrating information from multiple sources of the subject assessed.

In Brazil, the Federal Council of Psychology establishes standards regarding the use of psychological assessment instruments, explained in Resolution No. 031/2022 (Conselho Federal de Psicologia, 2022). This resolution establishes guidelines for the performance of psychological assessment, directs that the professional use complementary instruments of psychological assessment, non-psychological techniques and instruments, technical documents, such as protocols or reports of multiprofessional teams, provided that they are supported by the scientific literature of the area and that they respect the Code of Ethics and the guarantees of the profession's legislation.

Psychological assessment played an important role during the Covid-19 pandemic, as this disease resulted in mental health effects in both adult as well as child and adolescent populations. The systematic review conducted by Salari et al. (2020), showed that the prevalence of anxiety reached 31.09 % and the prevalence of depression 33.07 % in the general adult population during this period.

When it came to the child population, these data were even more concerning. The systematic review conducted by Panda et al. (2021), identified that 34.5 % of children and adolescents showed symptoms of anxiety and 41.7 % showed symptoms of depression, in the pandemic context. This is an important warning about the current state of mental health of children and adolescents and the need for professionals and adequate tools in mental health assessment, intervention, and promotion.

Children and adolescents who have experienced other traumatic contexts can also present important changes in mental health, resulting in feelings of depression and anxiety. Victims of sexual violence may present changes in self-image and interpersonal relationship problems, while children in

cancer treatment may present negative affect, changes in self-perception, and difficulty in interpersonal relationships (Anthony et al., 2019; Lima & Scortegagna, 2020, 2021).

Digital resources

Research on Artificial Intelligence (AI) and the development of interactive software have precipitated a substantial AI revolution, leading to its increased deployment across various domains, including commercial robotics and educational tools, with the objective of problem-solving and facilitating human labor (Tai, 2020). Presently, AI is extensively utilized in a plethora of daily applications, ranging from music and movie recommendations to consumer behavior-based promotions, thereby maintaining user connectivity (Silva & Ehrhardt Jr, 2020). In the healthcare sector, AI exerts a positive impact by enabling more precise diagnoses and treatments through the synergistic collaboration of scientists, physicians, and engineers, thereby enhancing the quality of life and healthcare efficiency (Dina, 2016).

Chatbots or conversational agents are intelligent computer programs designed to simulate conversations with humans through text or voice interactions (Herbert & Kang, 2018; Lin et al., 2023). Their interaction content can be powered by artificial intelligence or natural language processing technology, which allows them to understand and respond to operator inputs in a way that simulates human conversation (IBM, 2022; Inkster et al., 2018).

There are two main types of chatbots: rule-based ones and those powered by Artificial Intelligence (AI). Rules-based chatbots follow a predefined set of commands and responses, while those powered by AI use machine learning algorithms to improve their performance over time and provide more personalized and contextualized interactions (IBM, 2022).

However, human language is complex and dynamic. Embracing in a single word several meanings, can keep the human-machine interaction in a constant challenge to chatbots (Hill et al., 2015), requiring machines permanent learning and, from their developers, the execution of studies on the applicability of their tools.

These programs can be used for a wide range of purposes, including customer service, e-commerce, and, more recently, in education and healthcare (Dosovitsky & Bunge, 2023; Kaywan et al., 2023; Lin et al., 2023). They can be integrated into messaging platforms, websites, mobile applications, and other digital channels to provide instant support and assistance to users. Currently, ChatGPT has become the symbol of the greatest evolution and capability in human-machine communication available. This tool, which defines itself as a virtual assistant trained to understand and generate text in natural language, answer questions, provide information, assist in various tasks, and even engage in conversations on a wide range of topics (ChatGPT, 2024), is being widely used in various scenarios due to its enhanced ability to comprehend sentences.

The pandemic scenario of Covid-19 required compliance with health measures such as social isolation and activities conducted remotely (World Health Organization, 2020), which may have favored the use and application of these programs in contexts that required continuity, but with control of security measures aimed at reducing the spread of the virus. As an example, in the field of education, Chuang et al. (2023) used augmented reality as an aid in the virtual classroom. The use of chatbots in this study was pointed out as responsible for the improvement in learning and motivation of students who, due to the pandemic, could not attend classes in person.

A systematic review on the use of chatbots in healthcare was conducted by Pereira and Dias (2019). The studies found ($N = 30$) used conversational agents with adults in a wide range of skills (monitoring, cognition, affect, behavior, addictions, wellness, neurological disorders, nutrition, sexually transmitted diseases). The authors suggest that this is a field still growing in research, but with great potential, low cost, scalability of application, and interdisciplinarity in the dissemination of results, but that studies are still needed in the search for validity evidence.

Seeking to evaluate the efficacy and safety of using chatbots to improve mental health, a systematic review was conducted by Abd-Alrazaq et al. (2020). The authors identified that despite signaling great potential for use, these tools still had few studies, evidence of effectiveness was still divergent, and research could present risks of bias as practitioners actively conducted the interventions. The authors pointed out, however, that chatbots seem safe to use. The users evaluated did not report any harm, distress, adverse events, worsening of depressive symptoms, or other discomforts caused by

using the tools in the studies that conducted this type of evaluation. Overall, the results point to the need for further research for better conclusions.

In the field of child and adolescent mental health actions, studies are rare. Dosovitsky and Bunge (2023) developed a chatbot for interventions in adolescents with depression. Twenty-three subjects, recruited by parental referral, aged 13 to 18 years, participated in the research. The sample used a chatbot for the purposes of psychoeducation actions, teaching active behaviors, and changing negative thoughts. The results pointed to considerable acceptance of this sample for digital intervention resources, but with the suggestion of specific customizations to the age of the participants.

In 2021, Kowatsch et al. developed a chatbot that aimed to increase cognitive skills and knowledge about asthma and protective and interventional behaviors such as inhalation techniques. A total of 49 children and adolescents between 10 and 15 years old participated in the study. The chatbot interacted with the patient, his family, and the healthcare team. This conversational agent fostered patient-professional alliances and improved patients' cognitive and behavioral skills.

In New Zealand, Merry et al. (2020), reported the adaptation of chat tools for interventions for adolescents with depression or stress stemming from the changes brought about by Covid-19. The group proposes to apply an integrated ecosystem of connected digital tools to support adolescents in situations of mental distress through chatbots adapted to different ages and elements of culture. Although the brief report does not present further data, the authors suggest that the use of new integrated tools can provide rapid interaction and support for adolescents.

Another chatbot model, STARS (The WHO Sustainable Technology for Adolescents and Youth to Reduce Stress), was developed for interventions for adolescents between the ages of 15 and 18 who experienced high levels of stress. The interventions are based on a logical decision tree with sessions lasting approximately 10 minutes. In the communication, the authors report that they are conducting pilot studies with the tool in South Africa (Hall et al., 2022).

Although it is possible to identify an interest of the scientific community on the applications of chatbots in children and adolescents, this field is poorly explored, being restricted, for now, to interventions based on psychoeducation and behavioral suggestions. It is also observed that such interventions happen in populations that have a previous clinical diagnosis, but that conversational agents do not yet participate in the assessment/diagnosis processes.

To better understand the scientific landscape on psychological assessment or the mental health of children with the use of chatbots, a literature review was conducted by the authors of this article, using the terms (chatbot AND mental health OR psychological assessment AND child OR children). As of the date of writing this review (11/07/2024), the databases ScienceOpen, Pepsic, Indexpsi and ScienceDirect did not report, in their search tools, any study; while the DOAJ database, in the same configuration, returned 12 results, with only one study (Matheson et al., 2021), applying an intervention tool to 154 Brazilian adolescents, aged 13 to 18 years seeking interventions on body image. It is noted that no study aimed to develop a chatbot that could assess depressive and anxiety symptomatology in children and adolescents in traumatic situations.

Children and adolescents are increasingly in contact with smartphones and/or devices that connect them to the virtual world, reaching the mark of 24 million users connected to the Internet in Brazil (CETIC.BR; NIC.BR. TIC, 2020). Although this high exposure is often not welcomed by parents and teachers, the interaction of this population with digital resources has been occurring for some time, and there was a boost to this paradigm in the Covid-19 pandemic (WHO 2020). However, even though this population has extensive contact with the Internet and communication devices, studies on assessment tools developed specifically for them are rare.

It is observed that there is still a significant gap in the use of chatbot programs that focus on the assessment and promotion of mental health in children and adolescents. Thus, this study aimed to present a chatbot developed for the evaluation of anxiety and depression symptoms in children and adolescents, called Psico Bot.

Method

The Psico Bot composed the evaluation instruments used in the master's thesis of the first author of this article, under the supervision and co-supervision of the second and third authors, respectively. The general objective of the dissertation was to search for evidence of criterion validity of the Zulliger Test, R-Optimized application, through the use of multimethods of psychological

assessment, to evaluate the interpersonal relationship and self-image of child victims of sexual violence. The development of the Psico Bot comprised one of the specific objectives of this study focused on the development of a complementary instrument that could assist in the psychological assessment of children and adolescents, victims of documented sexual abuse, children with cancer, and children free of these misfortunes.

Construction

Psico Bot was developed between April and August 2019. Initially, a group of psychology professionals conceptualized the design and flow of the app so that it could assess symptoms of anxiety and depression, using 20 questions, in Portuguese, which contemplate physical and psychological symptoms. The questions were selected and adapted from studies that aimed to validate scales for face-to-face application (Gorayeb & Gorayeb, 2008; Leal et al, 2009; Oliveira & Sisto, 2010; Pereira & Amaral, 2004), using the following criteria: a) questions that assessed physical and psychological symptoms of anxiety and depression; b) questions with good psychometric indicators; and c) questions that assessed different precepts, seeking the limit of five physical indicators and five psychological indicators for anxiety symptoms, and the same amount for depression symptoms. The questions were freely adapted to the format used in the chatbot.

Next, expert computer professionals used the natural language processing platform Dialogflow (Google, 2009) and integrated it with the conversational platform Google Assistant for the development of the Psycho Bot. After that, intentions were created in Dialogflow from the selected questions. A total of 28 fixed intentions and one dynamic intention were created, generated through the user's previous response. To access the service via Google Assistant, a text or voice command "Talk to Psico Bot app" is used. As the app has not been published, at this point the feature is only accessible to the researcher's own email address.

The user can score a maximum of 10 points for anxiety and 10 points for depression. Answers marked with *Yes* (confer 1 point) and *No* (equals 0 zero). The only score inversion occurs in the question "Do you feel loved?", in which the answer *No* confers 1 point for depression. Its application, via a smartphone, can take an average of 10 minutes. The cut-off point of seven points to indicate the significant presence of anxiety and depression symptoms was based on the percentage value used in face-to-face scales (Gorayeb & Gorayeb, 2008; Leal et al., 2009; Oliveira & Sisto, 2010; Pereira & Amaral, 2004).

Pilot study

To verify the operation and applicability of the Psico Bot, as well as the understanding by the target population, a pilot study was conducted in the period between January and February 2020 with 10 children between 7 and 13 years old ($M = 11.02$, $SD = 1.87$), victims of documented sexual violence (Lima, 2020). The children and adolescents were contacted through foster care institutions, after signing the Informed Consent Form by the parents and the Consent Form by the child. The application of the Psico Bot identified high scores for anxiety ($n = 4$), depression ($n = 4$) or both ($n = 3$). The Psico Bot showed good internal consistency (Cronbach's alpha $\alpha = .852$). Good acceptance and understanding by the children and adolescents who used the instrument was observed.

Register

The Psico Bot was registered at the Instituto Nacional da Propriedade Industrial (INPI). Its identifier was registered under No. BR512020001180-2.

Ethical issues

The dissertation that gave rise to Psico Bot follows the Resolutions of the National Health Council No. 510 of April 7, 2016. The study was approved by the Research Ethics Committee, under opinion no. 3.622.765/2019.

Results

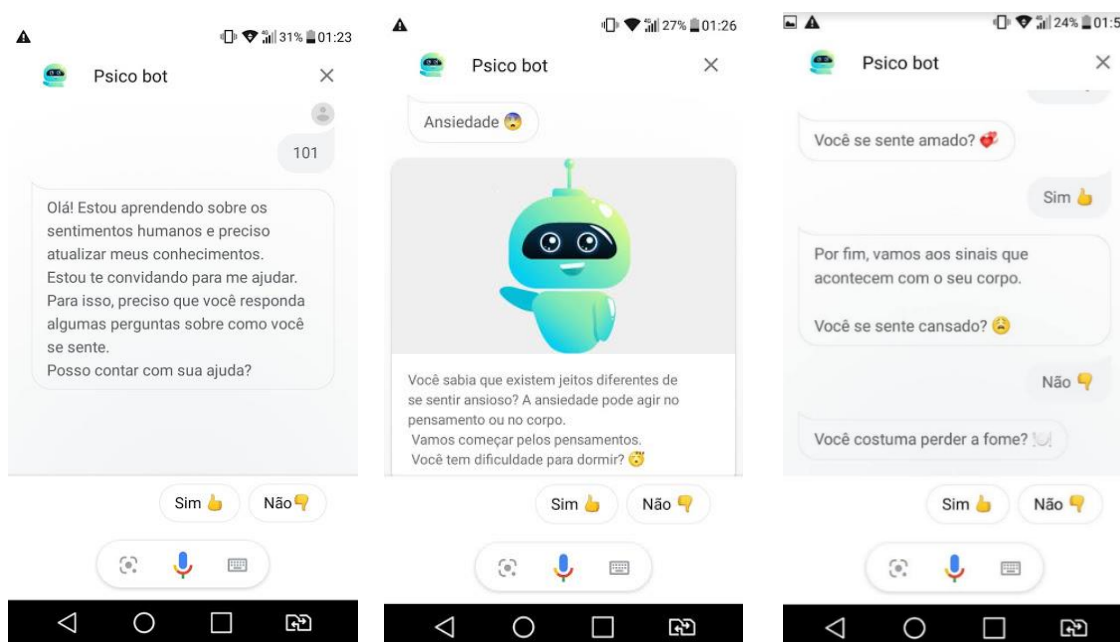
By presenting the Psico Bot, developed for the screening of anxiety and depression symptoms in children and adolescents, this study was based on the development of a tool that can complement the work of psychological assessment (Conselho Federal de Psicologia, 2022). This tool, despite automating parts of the assessment process, still requires a qualified professional to interpret its data and propose the appropriate diagnosis.

Thus, this chatbot was developed in order to assist the mental health professional to seek information about the psychological conditions of children and adolescents in a way that complements the fundamental techniques of psychological assessment. For this, it was based on a construction logic based on rules that lead the user in the interaction with the program.

On the first level of the dialog the program introduces itself and asks the user if it could help him by answering some questions (Figure 1). If the user answers affirmatively, the sequence of questions begins, otherwise the dialog ends with a thank you. The questions were distributed in two sections: anxiety and sadness. The intentions contain, besides the questions themselves, visual resources, such as images and symbols, to attract the user's attention and make the use of the conversational agent a playful experience (Figure 1). At the end of the dialog, the user is instructed to talk to an adult he trusts when he does not feel well emotionally.

Figure 1

User interaction screens (in Portuguese)



To facilitate the interaction between the chatbot and the children, that is, both the chatbot's understanding of the children's responses and the children's comprehension of the statements, and to overcome the limitations of machines to understand human language (Hill et al., 2015), it was chosen to build intentions that were easily identified. Thus, by default, chatbot-user (child) interactions offered the intentions *Yes* and *No*.

As the training phrases for all the intentions were *Yes* and *No*, the concept of continuity intentions was used, in which they were organized in a hierarchical manner so that the sequence of questions was respected. At the end of the dialog, the researcher receives an e-mail informing the answers provided by the user along with the calculation of the scores of anxiety and depression traits. For this, the Dialogflow fulfillment library (Google, 2009) was used, which captures the user's response and allows for personalized actions based on it.

When selecting and writing the questions, in addition to the instruments selected as references (Gorayeb & Gorayeb, 2008; Leal et al., 2009; Oliveira & Sisto, 2010; Pereira & Amaral, 2004), the criteria in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association,

2014) in its 5th edition at the time were also observed. For example, for the diagnosis of Major Depressive Disorder, in its criterion 1, the DSM-5 suggests that the depressed mood can be perceived as irritable mood in children and adolescents. This suggestion is contemplated in question D2. The same manual indicates that for the diagnosis of Generalized Anxiety Disorder in children, it is necessary to observe excessive worries about skills and performance. These elements are associated with questions A2 and A3. The Text Revision version of the DSM-5 (American Psychiatric Association, 2023) did not show significant differences in the indicators used, and the form of writing and presentation was maintained. The questions used as screening guides for anxiety and depression symptoms are shown in Table 1.

Table 1

Symptomatic screening questions from Psico Bot

Question	No	Yes
A1- Do you have difficulty to sleep?	0	1
A2- Do you have difficulty to pay attention in class?	0	1
A3- Do you delay when you need to choose something?	0	1
A4- Are you very worried recently?	0	1
A5- Do you feel afraid?	0	1
A6- Do you feel sick or vomit from nervousness?	0	1
A7- Do you sometimes feel your heartbeat faster?	0	1
A8- Do you keep on shaking your legs or feet when you are sitting down?	0	1
A9- Do you move a lot in your chair?	0	1
A10- Do you bite your nails?	0	1
D1- Do you think you do everything wrong?	0	1
D2- Do you feel bored or irritated?	0	1
D3- Do you sometimes feel lonely?	0	1
D4- Do you prefer to play alone?	0	1
D5- Do you feel loved?	1	0
D6- Do you feel tired?	0	1
D7- Do you usually lose your hunger?	0	1
D8- Do you feel like crying?	0	1
D9- Do you feel weak in your body?	0	1
D10- Do you feel like just lying down?	0	1

Note. A: Anxiety; D: Depression.

The questions were freely adapted and organized in the form of presentation following the order indicated in Table 1. It is noted that the questions sought to go through not only the psychological symptoms, but also physical aspects that may go unnoticed in an evaluation process. The use of simple language that did not take up too much screen space was intentional, aiming at speed and ease of assimilation for both younger children and adolescents.

Discussion

Considering that children and adolescents are increasingly using smartphones (United Nations Educational, Scientific and Cultural Organization & Centro Regional de Estudos para o Desenvolvimento da Sociedade da Informação, 2020), the use of Psico Bot in one of these devices may present advantages in its application for mental health assessment and intervention in this population. The more impersonal environment and conversation may favor, in assessment and intervention contexts, more reliable responses from users, which could be more difficult to achieve in direct interaction with the health professional, considering the short period of time.

This program can be especially useful and benefit evaluative processes in children and adolescents who present resistance or difficulty in interpersonal relationships. Children and adolescent victims of sexual violence, for example, may present difficulties in creating and maintaining positive attachments, resulting from automatic and dysfunctional thoughts and hasty interpretations of their surroundings, which can generate the feeling of danger when being close to another subject (Lima &

Scortegagna, 2020; Wu et al., 2018). This cognitive process can inhibit reliable responses in evaluative processes.

A similar mechanism can happen with children and adolescents in treatment for cancer or other diseases that require intensive care and prolonged hospital internment. Social isolation, fear of peer rejection, and decreased social skills may induce these patients to hypervalue relationships with the health care team, the main source of positive attachments, after caregivers (Anthony et al., 2019), which may generate responses that seek to maintain these attachments at the expense of symptom reliability.

Thus, in building a character that was attractive and friendly to children (Wei et al., 2018) and aiming to facilitate the engagement with the task, it was chosen as avatar for Psico Bot a robot with children's drawing characteristics. The quick contact with the tool and the need for an avatar that would provide instant identification, without male, female or age characteristics, facilitate the interaction with the chatbot by decreasing the user's sense of shame and increasing the feeling of anonymity in the interaction, when compared to human interactions (Fogg, 2002).

As observed in the study by Dosovitsky and Bunge (2023), it is important for children and adolescents that the components of digital resources aimed at them are familiar to their age. Thus, the way the Psico Bot is constructed privileges objects and languages that are accessible to the developmental conditions of the age group that is the focus of this instrument, in order to facilitate engagement and understanding by children and adolescents. Even for children who are still in the literacy phase and have difficulty reading the interactions, the chatbot relies on the speech feature of Google Assistant in an easily identifiable and configurable way.

In research use, the Psico Bot, in its current configuration, presents consistency in the application and sequence of questions. In this way, all children and adolescents who use this chatbot will be evaluated in the same way. The only difference will be for users who score above 7 in any of the constructs. In these cases, there will be guidance for the child or adolescent to request adult assistance.

Anonymity as well as information privacy will also be protected. When you open Psico Bot, you will be asked for an identifier of the evaluated subject. This identifier can be entered as a reference code and only the researcher's e-mail address will receive the collected information. This cautions against sharing sensitive information, as guided by the General Law of Data Protection (Brazil, 2018). As noted by Pereira and Dias (2019), groups more vulnerable to stigmatizing processes expect greater anonymity of their responses to exclusionary social processes when using conversational agents. Chatbots in these contexts, when they meet confidentiality requirements, become safe options to these subjects in evaluative processes. Psico Bot, in its current version, sends the information only to the professional who has the e-mail registered in the tool, thus ensuring its confidentiality. This mechanism can favor more reliable answers from the evaluated subject when its use is clarified.

Despite the advantages mentioned, it is important to note that this chatbot uses a rule-based system, therefore, it is a deterministic system in the relationship of questions and answers, following a set of predefined rules for the survey of anxiety and depression symptoms. Although this model indicates to be useful in its proposal, it presents some limitations such as the lack of flexibility, indicated in the minimum number of interactions to be answered (21) and the maximum number (28).

Thus, the Psycho Bot was not yet programmed to learn from new experiences, which requires constant monitoring and improvement of its technology. Also, by presenting short and objective answers, it may not meet the demands of the child or adolescent evaluated that are not related to the symptoms of anxiety and depression.

Despite the limitations of the tool, this program stands out for its innovation in proposing itself as a pioneer in the psychological assessment of children and adolescents. Although some studies already point to positive results in interventions in children using conversational agents (Dosovitsky & Bunge, 2023; Kowatsch et al, 2021), the psychological assessment of this population through chatbots is very incipient, and almost nonexistent.

This situation can be explained, among other reasons, by the model of the programs developed that seek, along with the commercial factor, the wide use by their target populations. For adults, it is easier to direct usable programs to their devices in view of their greater autonomy. For children and teenagers, on the contrary, there is a greater incentive to restrict and limit the use of communication devices (United Nations Educational, Scientific and Cultural Organization & Centro Regional de Estudos para o Desenvolvimento da Sociedade da Informação, 2020). Such limitation, necessary for the safety of children and adolescents, may also become a barrier in the development of chatbots specific to this

population with the purpose of symptomatology screening or psychological evaluation, since its use would be restricted to health professionals who have mastery of such technology.

Also, the time it takes for the child to understand its mechanism, answer the questions, and for the rater to obtain the values for each construct is reduced, lasting between 5 to 10 minutes. In addition, multiple simultaneous applications will also be possible, reducing costs for the researcher.

It is noteworthy that, despite the advancement of Artificial Intelligence technologies, the use of the Psycho Bot should be understood as instrumental. It will be up to the professional who uses it to make the diagnostic hypothesis based on multimethod assessment (Colombarolli et al., 2022; Mihura, 2012). However, the professional who uses it will realize that, in addition to the score of signs of anxiety and depression, will receive an evaluative map, through the questions answered, indicating which physical and/or psychological symptoms most cause discomfort to the subject evaluated, indicating paths for more specific interventions.

Finally, it is important to note that the period of completion of the Psico Bot construction was contemporaneous with the onset of the COVID-19 pandemic in Brazil (World Health Organization, 2024). This tragic moment in history required that safety measures be adopted for the sake of the health of diverse populations. With this, there was forcefully the interruption of this project that required face-to-face application in its testing moments.

With the end of the pandemic crisis and the resumption of face-to-face activities, it is necessary to continue this project. When the second phase begins, there will be assisted applications and subsequent analysis of the psychometric properties with the assessment of validity (concurrent and construct validity) and applicability of the tool. The goal is to apply Psico Bot to children and adolescents belonging to groups that have experienced traumatic situations, as well as normative and comparative groups, together with the application of evaluative multimethods that will help in the understanding of the capabilities of this chatbot.

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