

# Acceptability of a website and chatbot intervention to promote self-determined motivation and prevent adolescent pregnancy

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## Abstract

**Introduction:** Adolescent pregnancy continues to be a priority public health problem in Mexico, which requires innovative, culturally relevant interventions based on motivational theories. Digital interventions represent a promising strategy to promote preventive sexual behaviors in the school population. **Objective:** To evaluate the acceptability of the digital intervention "Be yourself", based on the Self-Determination Theory, for the prevention of adolescent pregnancy. **Material and methods:** A pilot randomized controlled trial was carried out with a pretest-posttest design and repeated measures. A total of 150 secondary school adolescents (11-15 years) were randomly assigned to an intervention (n=75) or control (n=75) group. The intervention was implemented for three weeks through an interactive website and an educational chatbot, integrated into the school curriculum. Assessments were carried out at baseline, post-intervention and two-month follow-up. **Results:** The intervention showed high acceptability, with an abandonment rate of 11.3% and high retention during follow-up. Participants reported high levels of satisfaction and perceived usefulness, suggesting good adherence and feasibility of implementation in the school context. **Conclusions:** "Be yourself" is a viable and acceptable digital intervention for Mexican adolescents. The findings support its potential to be evaluated in efficacy trials with larger samples, contributing to the development of innovative digital strategies for adolescent sexual health.

**Keywords:** generative artificial intelligence, personal autonomy, pregnancy in adolescence, computer communication networks

## 1 Introduction

Adolescent pregnancy is a persistent global public health problem [1], with significant implications for the educational, social and economic development of young people [2]. In Mexico, despite a recent decrease in rates, this phenomenon continues to represent a priority challenge, evidenced by the 30% increase in these pregnancies during the COVID-19 pandemic, with more than 373,661 adolescent births registered in 2021 [3]. This scenario requires the design and implementation of innovative and effective preventive strategies that transcend the limitations of traditional approaches to sexual health [4].

Theoretically, the promotion of preventive sexual behaviors can be based on Self-Determination Theory (SDT), which postulates that autonomous motivation and the satisfaction of basic psychological needs are crucial for the adoption and maintenance of healthy behaviors [5, 6]. In the context of adolescent sexual health, previous research suggests that fostering self-determined motivation may be a key component to the prevention of unplanned pregnancy [7]. Therefore, interventions that integrate these theoretical principles show promise for empowering adolescents to make informed and responsible decisions [7, 8].

In response to this need, digital interventions have emerged as tools with great potential, due to their accessibility, scalability, and acceptance among the young population [9]. Previous studies have documented the usefulness of educational websites and chatbots in the field of sexual health, offering personalized information and reducing barriers to access [10]. However, there is still a significant gap in the evidence regarding the acceptability and cultural appropriateness of these technologies for specific adolescent populations, such as Mexico [11].

In particular, there are limited studies that comprehensively evaluate the acceptability of interventions that combine a website with a chatbot, designed under a solid theoretical framework such as SDT and the

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Self-Determination Model for Sexual Behavior for the Prevention of Pregnancy in Adolescence (MACSPEA) adapted to the Mexican sociocultural context [7, 10]. Acceptability, understood as the extent to which users find the intervention appropriate and satisfying, is a necessary condition for its potential effectiveness and future scalability [12].

Therefore, the present study aims to evaluate the acceptability of an educational intervention called "Be yourself", which integrates a website and a chatbot, with the aim of promoting self-determined motivation and preventing adolescent pregnancy in the school population of Mexico. This research seeks to contribute to closing the existing knowledge gap and offer valuable perspectives for the development of culturally relevant and theoretically grounded digital tools in the field of adolescent sexual and reproductive health.

## 2 Materials and methods

### 2.1 Study design

A pilot randomized controlled trial, experimental, with a pre-test-posttest design and repeated measures, was carried out with the aim of evaluating the preliminary efficacy of the digital intervention "Be yourself". Participants were randomly assigned to either an intervention group, which received the digital educational intervention, or a control group, which received standard sexual health education (two sessions). The evaluations were carried out at three stages: baseline, immediate post-intervention and two-month follow-up. The study protocol was recorded in ClinicalTrials.gov (NCT06824922) [13].

### 2.2 Participants and sampling

The population consisted of adolescents aged 11 to 15 years enrolled in a public high school in the state of Nuevo León, Mexico, during the 2024–2025 school year. The sample size was estimated at 150 participants (75 per group) using nQuery Advisor, considering a significance level of 0.05, power of 90%, moderate effect size ( $d = 0.30$ ) and an expected loss of 20%. Simple random probability sampling was used for the selection and assignment of participants.

### 2.3 Eligibility Criteria

Adolescents who met the following criteria were included: age between 11 and 15 years, enrollment in public secondary school, access to a computer room with internet and residence with parents or guardian. Those with similar previous interventions or with cognitive limitations for the use of digital tools were excluded. Elimination criteria were voluntary withdrawal, change of school or address, attendance of less than 85%, incomplete or unreliable data, and pregnancy or use of contraceptive methods at the beginning of the study.

### 2.4 Procedure and intervention

After obtaining the informed consent of parents or guardians and the consent of the adolescents, sociodemographic and baseline data were collected once approved by the ethics and research committee (FAEN-D-2021). The "Be Yourself" intervention was administered through an interactive web platform with an educational chatbot, while the control group received traditional sex education. Data collection was carried out using validated instruments to assess knowledge, attitudes, and preventive behaviors. The intervention lasted three weeks (7 hours and 20 min), distributed in three sequential modules and pre-test and post-test evaluations, under a technology-assisted face-to-face modality (Table 1). The first module addressed personal factors (knowledge and self-exploration), the second socio-contextual factors (goals, values, sexual communication and problem solving) and the third psychological factor (self-determined motivation, negotiation,

rejection and risk perception). The activities included digital content, interactive exercises, role-playing and guided sessions with the chatbot, aimed at the development of cognitive, socio-emotional and behavioral competencies for the prevention of adolescent pregnancy based on Bartholomew's intervention design [14].

Table 1: Summary of the content of each session and components of the intervention

	Thematic content	Time	Components of the intervention
	Pre-test assessment app	40 min	Participants have access to the "Be Yourself" platform and must complete the questionnaires found in the resource area.
Primer Module	1. What is self-determined motivation? Discovering our dreams	40 min	Personal factors 1. Sex 2. Age of onset of sexual life 3. Knowledge of pregnancy prevention
	1. My Body: Anatomy, Physiology, and Sexual Health.	40 min	
	2. Navigating relationships: preventing unplanned pregnancy in adolescents.	40 min	
Second module	3. Exploring Goals and Values to Prevent Unintended Pregnancies	40 min	Contextual factors 1. Sexual communication with parents 2. Sexual communication with friends 3. Sexual communication with a partner
	4. Be yourself: stop, think and act; Introduction to Troubleshooting	40 min	
	5. Role-play: open dialogue about sexuality	40 min	
Third Module	6. Navigating the Sea of Healthy Choices: Exploring Our Motivation	40 min	Psychological factors 1. Intrinsic and extrinsic motivation 2. Satisfaction and frustration: autonomy, relationships and competences 3. Self-Determined Motivation 4. Behavioral Intent and Sexual Pregnancy Prevention Behavior
	7. My Space, My Decisions: Exploring Our Needs	40 min	
	8. Negotiating Healthy Choices: Preventing Pregnancy and STIs	40 min	
Maintenance	9. Building Self-Determined Motivation in Teens: Website and Chatbot Strengthening Session	Continue	
	Post-test assessment app	40 min	Participants have access to the "Be yourself" platform and must complete the questionnaires found in the resource area.
Total, hours		7 hours 20 minutes	

### 2.5 Instrument and statistical analysis

The acceptability of the intervention was evaluated by recording the acceptance and dropout rates, which were monitored through a structured log with dichotomous items (1 = Yes, 2 = No), complemented by a space to document the causes of dropout. These rates were estimated based on the information contained in the Consolidated Standards of Reporting Trials (CONSORT) flowchart [15]. In addition, an acceptability evaluation format was applied, which made it possible to assess overall satisfaction with the intervention, including general liking, fulfillment of expectations, perceived usefulness of the activities, efficiency in the delivery modality, and facilitator performance [16]. This instrument was administered at the end of the intervention, after the last session was concluded. Descriptive statistics, relative frequency measures and central tendency were used to raves of SPSS version 26.0 statistical program.

### 3 Results

Of the total of 75 adolescents assigned to the "Be Yourself" intervention group, 74 received the intervention, with a post-assignment loss of 1.3% (1/75). During follow-up, an additional 4 participants dropped out of the study, so 70 adolescents completed all assessments. The total dropout rate in the intervention group was 6.7% (5/75), indicating high retention and adequate adherence to the intervention (Table 2). 95% confidence intervals (CIs) for dropout rates were calculated using the exact Clopper–Pearson method, using as a denominator the number of participants at risk at each stage of the study, in accordance with the CONSORT recommendations for pilot trials [15]. According to the CONSORT diagram, the post-assignment dropout rate was 1.3% (95% CI: 0.03–7.2%), while an additional loss of 5.4% was observed during follow-up (4/74; 95%CI: 1.5–13.3%). Overall, the overall dropout rate from the intervention group was 6.7% (95% CI: 2.2–14.9%).

Table 2: Intervention group dropout rate

Measurement Stage	"Be yourself" (n=75)	
	f (%)	95% CI
Post-assignment	1 (1.3)	0.03–7.2
Follow-up	4 (5.4)	1.5–13.3
Total abandonment	5 (6.7)	2.2–14.9

Note: CI = 95% confidence interval, calculated using the exact Clopper-Pearson method.

The acceptance rate for the study was 46.4%, indicating that of the 323 adolescents evaluated for selection, 150 agreed to participate in the study after meeting the inclusion criteria. This percentage reflects the interest and willingness of adolescents to be part of the intervention, although it also shows possible barriers that limited greater participation, such as institutional factors or perception of the topic addressed. The "Be Yourself" intervention showed high acceptability among participants. 97.3% (72 out of 74) indicated that the intervention was to their liking, and 74.3% (55 out of 74) rated it as "very good". Regarding the fulfillment of expectations, 56.8% (42 out of 74) considered that the intervention met "quite a lot", and 43.2% (32 out of 74) that it met "somewhat". As for the activities, 60.8% (45 out of 74) said that they were all to their liking, and 62.2% (46 out of 74) considered them "quite" interesting. Regarding utility, 75.7% (56 out of 74) rated them as "quite" useful. Regarding the time of the sessions, 63.5% (47 out of 74) considered that one hour was enough. The main situations that prevented attendance were health problems (52.7%, 39 out of 74) and weather (23.0%, 17 out of 74). Finally, 82.4% (61 out of 74) rated the facilitators' performance as "very good".

The results of this pilot trial indicate that the digital intervention "Be yourself", based on the SDT/MACSPEA [5, 6], has high acceptability among Mexican adolescents in school. The low rate of total dropout of the intervention group, together with the high levels of satisfaction and perceived usefulness, suggest that the integration of a solid theoretical framework with interactive digital tools website and chatbot constitutes a viable and well-received strategy to address the prevention of adolescent pregnancy, a priority public health problem in Mexico [3, 1].

The observed high retention is a relevant indicator of adherence and supports emerging evidence on the potential of conversational technologies to maintain adolescent engagement in sexual health interventions. By offering personalized, confidential, and real-time interactions, chatbots respond to key preferences of this population on sensitive topics (9,10). Likewise, the high satisfaction and perceived usefulness suggest that the intervention design managed to effectively operationalize the central constructs of SDT, particularly the promotion of autonomy, competence and informed decisionmaking [5, 6]. This finding is consistent with previous studies that underscore the importance of theoretically grounded interventions to increase their

relevance and potential impact on adolescent sexual health [7, 8].

The present study contributes to the body of evidence supporting the use of digital tools in adolescent health [11], especially in the Mexican context, where research in this area remains limited. The levels of acceptability coincide with systematic reviews that highlight the potential of websites and chatbots for the promotion of preventive sexual behaviors [9]. Nonetheless, the initial acceptance rate suggests that barriers to recruitment and participation persist, highlighting the need to consider contextual, institutional, and organizational factors in future implementations, particularly with an eye toward scalability [12].

Taken together, the findings support the premise that interventions aimed at strengthening self-determined motivation, through personal reflection and informed decisionmaking, may be better received than exclusively prescriptive approaches [17]. The demonstrated feasibility justifies moving towards a larger-scale trial that assesses not only acceptability, but also the impact of the intervention on the constructs of SDT and on preventive sexual intentions and behaviours. Overcoming the inherent limitation of pilot studies, the absence of efficacy evaluation, will be fundamental to determine whether this acceptable intervention can be consolidated as an effective strategy in adolescent sexual health in Mexico [4].

### 3.1 Implications and limitations

The use of a website and a chatbot represents a promising strategy to promote adolescent participation, facilitate access to reliable information, and reduce barriers associated with confidentiality and stigma. The study also confirms the relevance of assessing acceptability as a key preliminary outcome in pilot trials, following the CONSORT recommendations.

Among the limitations, it is recognized that the pilot nature of the study, the small sample size, and the inclusion of a single institution limit the generalizability of the results. Assessment through immediate self-reports may be influenced by social desirability biases and the face-to-face-assisted modality does not allow the findings to be extrapolated to completely autonomous contexts. Finally, acceptability does not imply efficacy, so larger-scale controlled trials are required to assess the impact of the intervention on self-determined motivation and preventive sexual behaviours.

## 4 Conclusions

The digital intervention "Be yourself" showed high acceptability among Mexican schooled adolescents, reflected in low dropout rates and high levels of satisfaction and perceived usefulness. These findings support the feasibility of digital interventions based on SDT, which integrate interactive websites and chatbots, as relevant strategies for the prevention of adolescent pregnancy in this context. It is recommended to move towards larger-scale efficacy trials, incorporate mixed methods to deepen the user experience, evaluate their implementation in autonomous modalities, and explore their adaptation to adolescent populations in a more vulnerable situation. Overall, this pilot study provides preliminary evidence relevant to the development of innovative and culturally relevant digital tools in adolescent sexual health in Mexico.

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