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# Implementation of the STEPPS program for the treatment of self-harm behaviors in Catalonia's prisons: barriers and facilitators

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## Abstract

**Background** The Systems Training for Emotional Predictability and Problem Solving (STEPPS) is an evidence-based program that has been shown to be effective in reducing self-harm behaviors in Correctional Settings (CS). However, there is limited understanding of the contextual factors that impact the implementation of this intervention within such complex environments. A comprehensive understanding of the implementation process is crucial for the successful adoption of this program. This study aims to examine the factors that influence the implementation of the STEPPS program in CS, specifically regarding the management of self-harm behaviors.

**Method** A hybrid implementation effectiveness type III study was conducted in penitentiary centers in Catalonia (Spain). Eight Focus Group Discussions based on the Consolidated Framework for Implementation Research (CFIR) were conducted with 17 professionals who implemented the STEPPS program. Additionally, quantitative data were gathered using an open-closed questionnaire based on a CFIR questionnaire.

**Results** The results indicated that the scientific evidence and knowledge acquired during the implementation process were seen as facilitators. Also, meetings and support from the external research team were considered positive factors. Conversely, implementation barriers of the STEPPS program in CS included the complexity of the intervention format and the mobility of inmates between modules and centers during the duration of the program.

**Conclusions** These findings represent the first attempt to address self-harm behaviors within CS while considering the implementation process. They provide valuable insight into adapting evidence-based interventions, such as STEPPS, for implementation in CS.

**Trial registration** NCT06297460 (ClinicalTrials.gov, retrospectively registered).

**Keywords** Self-harm behaviors, Correctional facilities, Penitentiary intervention, Implementation research, STEPPS

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## Contributions to literature

- The study addresses a critical gap in the literature regarding implementation of Evidence-Based Practices in complex settings such as Correctional Settings, where self-harmed behaviors are of significant concern.
- This is the first implementation study conducted in correctional settings in Spain.
- These findings contribute to determining the barriers and facilitators of implementing STEPPS in correctional settings, offering valuable insight into the necessary adaptations. This information was obtained from both qualitative and quantitative data.

## Background

Self-harm behaviors in Correctional Settings (CS) are a significant problem, often left untreated, with important consequences for both inmates and the prison system [1, 2]. The prevalence of self-harm is notably higher in these environments, contributing to critical issues such as an increased risk of suicide [3, 4]. Correctional settings themselves are considered risk factors due to their inherent contextual characteristics, including isolation and high levels of stress [1, 5]. Addressing this matter requires not only evidence-based interventions, but also further studies to gain intervention scalability in this context, given the inadequacy of current interventions [6, 7].

In response of this issue, the Systems Training for Emotional Predictability and Problem Solving (STEPPS) program stands out as an effective intervention for addressing emotional and behavioral challenges [8]. Developed by Dr. Nancee Blum in the United States, STEPPS is based on established Evidence-Based Psychological Practices (EBPPs) and integrates cognitive-behavioral components. The program consists of 20 group therapy sessions, which are divided into three primary phases [8, 9]. The first phase, Awareness of Problems, helps individuals recognize and understand their difficulties, motivating them toward change. The second phase, which spans sessions 3 to 12, focuses on Emotional Regulation Skills Training. In this phase, participants learn specific skills including emotional distancing, effective communication, challenging negative thoughts, distraction techniques, and problem-solving. The third phase, Behavioral Regulation Skills Training (sessions 13–20), addresses goal setting and the development of healthier habits related to eating, sleep, physical activity, leisure, and overall health, while also addressing self-destructive behaviors and enhancing interpersonal relationships.

The STEPPS program specifically aims to address emotional and behavioral dysregulation, which often underlie

self-harming behaviors [10–12]. Although originally designed as a group-based treatment for Borderline Personality Disorder (BPD), research has demonstrated its effectiveness in reducing self-harm and suicidal behaviors, lowering infractions, improving overall functioning, and achieving high levels of satisfaction in both clinical and correctional settings [5, 6, 9–14]. A recent systematic review conducted in 2023 [11] provides the state of the art regarding the effectiveness of the STEPPS program, within the 20 studies included five of them were specifically developed in correctional settings.

One of the key strengths of the STEPPS program is its structured, easy-to-implement design, supported by a detailed manual that facilitates its application. Therapist training is brief and low-cost, making it practical for everyday clinical practice. The program's 20-week duration allows for efficient delivery of treatment, and its group format promotes mutual support among participants, enhancing both engagement and cost-effectiveness. Furthermore, STEPPS can be used alongside other ongoing treatments, allowing patients to continue their usual care while benefiting from the program [15–17].

Its effectiveness in reducing self-harm behaviors and improving overall functioning makes it a valuable candidate for implementation in addressing these behaviors and furthermore the previous application in correctional facilities indicate the suitability for this context.

Studies about EBPPs, such as the STEPPS program, provide scientific evidence on what interventions to implement. However, studies focusing on how to implement these interventions are crucial for addressing psychological problems in the population. Transitioning from the what to the how is essential when it comes to addressing the problems that arise in CS [18]. In fact, the lack of this information presents a barrier to promoting mental health in prisons, so it is necessary to assess the contextual factors and understand the influences on the implementation processes [19]. For example, these settings were not established with a treatment-oriented perspective, making it challenging to create effective programs that address a wide variety of conditions [20, 21]. Moreover, the perspective and attitudes of stakeholders, along with problems in accurate diagnosis, human and physical resources, time, training, and qualified mental health professionals are some of the factors that impact the implementation process [22]. Context is a critical aspect of the implementation process, and taking the various contextual factors into account is essential for the successful implementation and dissemination of interventions in different settings [23–26].

Implementation Science (IS) enables the assessment of key factors that interfere with the uptake of an intervention [27]. The Consolidated Framework for

Implementation Research (CFIR) is among the most established frameworks employed in implementation research [28]. This meta-theoretical framework encompasses a set of constructs within five domains, offering a comprehensive approach to assess 39 determinant factors. Determinant factors are identified as those that hinder or facilitate the results of the implementation efforts [29]. The domains considered by CFIR include the *Characteristics of the Intervention* (I) that influence the implementation, the external determinants which encompass the *Outer Setting* (II), the characteristics of the specific organization where implementation occurs (*Inner Setting*, III), the *Characteristics of Individuals* involved in the direct implementation (IV), and finally the different agents and phases involved in the *Implementation Process* (V). Establishing the determinant factors in the implementation process of the STEPPS program in CS will enhance the understanding of the dynamics of this complex context, enabling the development of specific adjustments and implementation strategies [30].

To address the imperative of translating EBPPs from research to practice, this study aims to reduce this gap to benefit those in need of psychological interventions. Specifically, the primary objective of this article is to address a fundamental question in Implementation Science: What factors influence the implementation of the STEPPS program in CS in terms of the management of self-harm behaviors?

For this purpose, a hybrid implementation effectiveness type III study was conducted to understand the barriers and facilitators in the uptake of the STEPPS program to address self-harm behaviors in penitentiary settings. This study not only provided insights into the challenges faced but also laid the foundation for implementing strategies to effectively address self-harm behaviors within CS in Catalonia.

## Method

### Study design

This mixed-methods study, encompassing both quantitative and qualitative analyses, is part of a broader hybrid effectiveness-implementation type III study carried out in CS in Catalonia to address self-harm behaviors. However, the primary focus of this work is to report barriers and facilitators, while effectiveness outcomes are reported in another study [31].

In the qualitative assessment phase, we facilitated eight online Focus Group Discussions (FGDs) [32, 33] utilizing the Consensual Qualitative Research (CQR) methodology [34]. To complement this qualitative insight, a quantitative assessment was conducted.

The study was approved by the General Directorate of Penitentiary Affairs from the Government of

Catalonia Department of Justice Rights and Memory (Code=Steppscp's).

### Study participants and study setting

Participants were professionals from CS, trained in the implementation of the STEPPS program. They were selected and recruited by stakeholders in each center, considering their profiles and previous training. The study was conducted in closed regime PCs in Catalonia.

Catalonia, together with the Basque Country, are the only Autonomous Regions in Spain with executive competence in the management and organization of penitentiary centers, as per Spanish legislation. The Department of Justice of the Government of Catalonia oversees penitentiary policies in the region since January 1, 1984, as specified in Royal Decree 3482/1983 dated December 28.

Regarding general data of CS in Catalonia, the most recent statistics (2023) indicate a gender distribution with 94.0%-94.3% male and 5.7%-6.0% female in their centers. The overall average age is 39.4, with men averaging 44.2 and women 38.3. Additionally, 48.7%-50.3% of the population comprises individuals from other countries, primarily from North Africa (Maghreb) and Central and South America, while 49.6%-51.3% are from Spain [35].

This study was conducted including all closed centers of Catalonia, except the Female center of Barcelona. This center was subsequently included in the new implementation, incorporating the changes made based on this study. The centers participating include: *Lledoners*, *Brians 2*, *Brians 1 Men*, *Brians 1 Female*, *Ponent*, *Puig de les Basses*, *Quatre Camins*, *Más Enric*, and Youth PCs. The results from one center could not be included in the study due to a delayed implementation start (*Puig de les Basses*).

The selected professionals who implemented the STEPPS program received four training sessions, each lasting five hours (20 h in total), conducted by two trainers, along with bi-weekly follow-up sessions. Throughout this process, implementers were also required to engage in extensive reading of the STEPPS manual.

### Data collection and analysis

#### Qualitative data

Qualitative analyses involved in-depth interviews with professionals from the centers, each lasting between 60 to 90 min. To guide the development of these analyses, the CFIR served as a framework, assisting in semi-structured interviews (See Additional file 1) and formulating relevant questions based on the five domains that influence the implementation process: (1) Intervention Characteristics, (2) Outer Setting, (3) Inner Setting, (4)

Characteristics of Individuals, and (5) Implementation Process [28, 36].

Focus groups were conducted through online meetings (videoconference) via Google Meet and were transcribed using Sonix.ai [37] and then checked by RL-C. The transcriptions of these interviews were coded using CFIR constructs within the five domains, adhering to the qualitative codebook with operational definitions and inclusion/exclusion criteria for each mutually exclusive construct. The code application was a collaborative effort undertaken by two coders (RL-C and IJ), utilizing ATLAS.ti version 23 software [38]. In the event of disagreement, a third coder (AG-P) resolved it.

The results were aggregated by construct using the CQR methodology [39, 40], determining the proportion of barriers and facilitators within each domain. The CQR methodology provides a framework for analyzing qualitative data, emphasizing a team-based approach and consensus-building. The analysis focuses on three key components: domains, categories, and core ideas. Initially, individual coding was conducted independently by two coders (RL-C and IJ). Subsequently, consensus meetings were held to discuss each quote and coded construct. The data was organized by coding core ideas, which involved summarizing participants' transcripts. These core ideas were then categorized based on consistencies across transcripts and grouped into relevant domains. Transcription coding was achieved through a consensus process, with input from an auditor (AG-P). Detected quotes underwent numerical rating by two coders (RL-C and IJ) following the guidelines available at <https://cfirguide.org/evaluation-design/qualitative-data/>. Specifically, a value between -2 and +2 was assigned to each construct association, indicating whether it functioned as a barrier, a neutral aspect, or a facilitator.

Throughout the interviews, participants not only highlighted barriers and facilitators but also provided valuable recommendations regarding various factors involved in the implementation process. These recommendations were also coded to document insights into potential future improvements.

The checklist based on Consolidated criteria for reporting Qualitative Research (COREQ) [41] for explicit and comprehensive reporting of interviews and focus groups was used and included in the study as Additional file 2.

Quantitative data were gathered through the administration of questionnaires using the Qualtrics software program [42]. A closed-open questionnaire was developed following CFIR guidelines, with reference to the study conducted by Hadjistavropoulos and colleagues [43]. The questionnaire used in this study is available in Additional File 1. It includes a reflection of the CFIR dimensions and constructs, the original items from the

Hadjistavropoulos study, and the specific adaptations made for this research. The final questionnaire comprised 41 items rated on a 5-point Likert scale (ranging from 1, strongly disagree, to 5, strongly agree), assessing: Intervention Characteristics (7 items), Outer Context (5 items), Inner Setting (14 items), Characteristics of Individuals (8 items), and Implementation Process (7 items).

Descriptive statistics were employed for the quantitative analysis. Following the methodology of a prior study [43], ratings above four were classified as positive perceptions of the implementation process, those below three were considered as negative perceptions needing improvement, and responses within the range of three to four were considered neutral.

## Results

A cohort of 17 professionals participated in this study, with their demographic characteristics detailed in Table 1. All participants provided informed consent prior to their inclusion in the study.

The results from both qualitative and quantitative assessments are summarized in Table 2. The information coded from the interviews has been systematically organized in alignment with the CFIR constructs and categorized into barriers and facilitators. Additionally, the table includes quantitative data corresponding to each construct, with mean and standard deviation values provided. Based on the interpretation of the questionnaire and the resulting means, these factors were categorized as barriers, facilitators, or neutral factors.

**Table 1** Demographic data professionals

Variable	Data
Age (mean; <i>SD</i> )	45; 6.9
Gender (n, %)	
Male	5, 29.4%
Female	12, 70.6%
Profession (n)	
Psychologist	15
Educator	1
Head of specialized attention	1
Center (n)	
Lledoners	2
Brians 2	2
Brians 1 (Male and female)	3
Ponent	2
Quatre Camins	3
Màs Enric	2
Youth Penitentiary	3
Experience (mean in years; <i>SD</i> ; range)	15; 10.44; 2–35

*SD* Standard Deviation

**Table 2** Barriers and facilitators based on CFIR assessment

	Qualitative assessment CFIR		Quantitative assessment CFIR		
CFIR	Barrier	Facilitator	Statements (score 0–5)	Mean/SD	B/F/N
<b>I. Innovation Characteristics</b>					
<b>A. Innovation Source</b>	-Some professionals required to attend the course were not informed about its objectives, which included participating in an implementation study			X = 3.58; SD= 1.46	N
<b>B. Evidence Strength &amp; Quality</b>		- Innovation evidence - Promote access to theoretical knowledge	The scientific evidence on the STEPPS program is solid	X = 4.58; SD=0.71	F
<b>C. Relative Advantage</b>			The STEPPS program has several advantages for inmates	X = 4.41; SD= 1.0	F
<b>D. Adaptability</b>	- Adaptation to the context	- Adaptability including session duration, complexity, oral content, and visual content	It is beneficial for the STEPPS program to address both behavioral and emotional dysregulation	X = 4.94; SD=0.24	F
<b>E. Trialability</b>		- Comments about the desire to implement it again based on this trial or trial in <i>Quarre Carmins</i>	It has been beneficial to be able to test the STEPPS program on a small scale in our Correctional Center	X = 4.23; SD=0.97	F
<b>F. Complexity</b>	- Extensive length of the intervention - Long duration of the sessions - Written content: complex and abstract language - Long assessment protocol - Written questionnaire at the beginning of each session (BEST) - The weekly attendance of the program that was set as the standard was seen as not being sufficient to address the problem		It is beneficial that the STEPPS program consists of 16 modules spread over a period of 16 to 18 weeks	X = 3.35; SD= 1.41	N
<b>G. Design Quality &amp; Packaging</b>	- Written content of the intervention	- Well-valued modules including healthy lifestyle habits, emotional intensity record, cognitive distortions, cognitive schema, and challenge - Quality of the dossier. – Manual contents - The program emphasizes practicing the learned therapeutic strategies - The program establishes that the implementation must be carried out by two professionals	STEPPS program materials are of high quality	X = 3.88; SD= 1.27	N
<b>H. Cost</b>					
<b>CFIR</b>					
<b>II. Outer Setting</b>					
	<b>Qualitative assessment CFIR</b>	<b>Facilitator</b>	<b>Quantitative assessment CFIR</b>	<b>Statistics</b>	<b>B/F/N</b>
	<b>Barrier</b>		<b>Statements</b>		

**Table 2** (continued)

<b>A. Patient needs &amp; resources</b>	<ul style="list-style-type: none"> <li>- Some professionals perceive self-harmed behaviors through stigmatized beliefs, often minorizing and instrumentalizing them</li> <li>- Characteristics of participants including presence of dual diagnosis, high impulsivity traits, drug use, overmedicalization, disruptive profile, low tolerance to frustration and variety of life histories</li> <li>- Language difficulties and need for linguistic adaptation</li> </ul>	<ul style="list-style-type: none"> <li>- Awareness of the importance of addressing self-harm behaviors by correctional officers</li> <li>- Involvement of peers in the approach to self-injury</li> </ul>	<p>My Correctional Center is aware of the great need for mental health care</p> <p>X = 4.12; SD = 1.05 F</p>
<b>B. Cosmopolitanism</b>			<p>My center benefits from a partnership with the LabPsItec Laboratory of the University Jaume I of Castellon</p> <p>X = 3.64; SD = 0.93 N</p>
<b>C. Peer Pressure</b>			<p>There is pressure from other correctional facilities to implement the STEPPS program</p> <p>X = 3.17; SD = 1.01 N</p>
<b>D. External Policy &amp; Incentives</b>	<ul style="list-style-type: none"> <li>- Special Management Unit (SMU) judicial regulations</li> <li>- The judge's authorization is compulsory for mobility when in the condition of SMU</li> </ul>		<p>There is pressure from prison management to implement STEPPS</p> <p>X = 3.7; SD = 1.1 N</p> <p>My Correctional Facility is aware of the recommendations that have been made to implement the STEPPS program</p> <p>X = 3.94; SD = 1.19 N</p>
<b>CFIR</b>			<p>Statistics</p> <p>B/F/N</p>
<b>III. Inner Setting</b>			
<b>A. Structural Characteristics</b>	<ul style="list-style-type: none"> <li>- DERT consequences including psychological consequences, sanctions and non-mobility and impossibility of session attendance</li> <li>- Unstable time in the same module</li> </ul>		<p><b>Quantitative assessment CFIR</b></p> <p><b>Statement</b></p> <p>My Correctional Facility has an adequate number of therapists available for the implementation of the STEPPS program</p> <p>X = 3.0; SD = 1.58 B</p>
<b>B. Networks &amp; Communications</b>	<ul style="list-style-type: none"> <li>- Lack of communication or involvement of peers</li> </ul>		<p>The waiting list for mental health care at my Correctional Facility is long</p> <p>X = 1.53; SD = 0.62 B</p> <p>We have had an adequate number of formal meetings to discuss the implementation of STEPPS at my Correctional Facility</p> <p>X = 3.70; SD = 1.40 N</p> <p>We have had an adequate number of informal meetings and discussions on the implementation of STEPPS at my Correctional Facility</p> <p>X = 3.76; SD = 1.34 N</p>

**Table 2** (continued)

<b>C. Culture</b>	- The regimental prevails over the treatment	- No sanction for patient withdrawal from the program	We have a good attitude towards the mental health needs of the users	X = 4.23; SD = 0.83	F
<b>D. Implementation Climate</b>	- Ambivalence to change from patients - The non-inclusion of incentives for patients	- Motivation patients - Motivation professionals	There is a strong interest in doing things differently at my correctional facility	X = 3.53; SD = 1.28	N
<b>1. Tension for Change</b>	- No access to the reinforcement team (family, friends), feature of the STEPPS difficult to implement in closed setting	- Perceived need for professionals to address self-injury	It is easy to incorporate STEPPS into our regular clinical workflow	X = 2.53; SD = 1.28	B
<b>2. Compatibility</b>	- Performing paid work on the same schedule - Mobility between centers and between modules				
<b>3. Relative Priority</b>	- Saturation of other programs - Perception from colleagues that self-harm behaviors are not a priority		STEPPS is given a high priority in my environment	X = 3.12; SD = 1.36	N
<b>4. Organizational Incentives &amp; Rewards</b>		- Non-compensation of patients for their participation - Validation of other courses of similar content when taking the STEPPS program	Therapists within my clinic who have administered STEPPS are recognized for doing important work	X = 3.17; SD = 1.5	N
<b>5. Goals &amp; Feedback</b>			We have established specific goals for STEPPS in the prison environment	X = 3.41; SD = 1.32	N
<b>6. Learning Climate</b>			We have adequate time to reflect on how STEPPS works and address challenges in the clinical setting of the Correctional Center	X = 2.7; SD = 1.35	B
<b>E. Readiness for Implementation</b>		- Adjustment of the program to the patients' characteristics - Implication of leaders			
<b>1. Leadership Engagement</b>			Prison managers are committed to the STEPPS program	X = 3.35; SD = 1.41	N
<b>2. Available Resources</b>	- Conducting the sessions within the module - Conducting the sessions outside the module - Classroom characteristics - Time available for carrying out the sessions	- Adequacy of the facilities used as the library - Conducting sessions outside the module - Conducting the sessions in the module itself	Therapists have been given sufficient time to learn and deliver STEPPS	X = 3.12; SD = 1.49	N
<b>3. Access to Knowledge &amp; Information</b>	- One of the implementers did not attend the training	- Training professionals on implementation	We have had adequate access to information about the STEPPS program from the LabsITec team	X = 4.47; SD = 0.79	F

**Table 2** (continued)

CFIR	Qualitative assessment CFIR	Facilitator	Qualitative assessment CFIR	Statements	Statistics	B/F/N
<b>IV. Characteristics of Individuals</b>						
<b>A. Knowledge &amp; Beliefs about the Innovation</b>						
	Barrier					
	- Non-enthusiastic perception of program implementation	- Enthusiasm regarding the intervention training and its implementation		Trained therapists at the Correctional Center have adequate knowledge about the STEPPS program	X = 4.23; SD = 0.90	F
				Therapists at the Correctional Center are committed to delivering the STEPPS program	X = 4.52; SD = 0.68	F
				Therapists at the prison have solid skills in self-injury intervention	X = 4.05; SD = 0.74	F
				Therapists at the Correctional Center are competent to administer the STEPPS program	X = 4.29; SD = 0.68	F
				Therapists at the Correctional Center are committed to improving mental health care	X = 4.53; SD = 0.79	F
				Therapists at the Correctional Center have a strong interest in learning	X = 4.35; SD = 0.86	F
<b>B. Self-Efficacy</b>						
<b>C. Individual Stage of Change</b>						
<b>V. Process</b>						
<b>A. Planning</b>						
	Barrier					
	- Patients with internalized self-injury	Implementation by two therapists		We spend adequate time planning ahead how to administer the STEPPS program at the Correctional Facility	X = 3.17; SD = 1.28	N
	- Patients with distrust towards the program	- Motivation and perceived need for change among patients		Therapists at my Correctional Facility received adequate training in the STEPPS program	X = 3.94; SD = 1.24	N
				The Correctional Facility made sure to inform all staff at the facility about the STEPPS program, including those who did not implement the program	X = 3.52; SD = 1.58	N
				Adequate work was done in assigning therapists	X = 3.88; SD = 1.05	N
				The team of the Specialized Intervention Program Unit helped us to find alternatives to the difficulties detected	X = 3.82; SD = 0.95	N
<b>B. Engaging</b>						
<b>2. Formally Appointed Internal Implementation Leaders</b>						
<b>3. Champions</b>						

**Table 2** (continued)

<p><b>4. External Change Agents</b></p>	<p>- Support received from the LabPsiTec research team</p> <p>It was helpful for LabPsiTec to obtain research funding to support the STEPPS program in the Penitentiary Centers of Catalonia</p>	<p>X = 4.12; SD = 0.78</p>	<p>F</p>
<p><b>6. Innovation Participants</b></p>	<p>- Erroneous inclusion of patients not meeting criteria for self-injury</p> <p>- Adherence problem</p> <p>- Problems in ensuring fidelity in the application of the program</p> <p>- Delay in starting the program after patient recruitment</p>	<p>X = 4.53; SD = 0.62</p>	<p>F</p>
<p><b>C. Executing</b></p>	<p>- Monitoring and adjusting session content with the LabPsiTec research team</p>		
<p><b>D. Reflecting &amp; Evaluating</b></p>			

Quantitative data interpretation: > 4 = facilitators (positive perceptions); < 3 = barriers (areas needing improvement) facilitators (positive perceptions) and, 3–4 = neutral perceptions  
*B* Barrier, *CFIR* Consolidated Framework of Implementation Research, *F* Facilitator, *M* Neutral, *SD* Standard Deviation

### Intervention characteristics

Both qualitatively and quantitatively, the *evidence Strength and Quality* of the innovation were outstanding, particularly in terms of providing access to a robust theoretical foundation for addressing self-harm behaviors. *Adaptability* concerns within the context were acknowledged, with positive feedback on adjustments related to session duration, content complexity, and the option to convey information in a more oral and visual manner (See Supplementary material 3: Table S3 for specific examples). In both analyses, professionals highlighted the benefits of the *Trialability* aspect of the intervention. Thus the possibility to test the program in a small case through the previous pilot was also considered a facilitator. This refers to the pilot study that was conducted in one center with a single group (*Quatre Camins*), in which the original version of the STEPPS program was applied.

The implementation process was perceived with varying levels of *Complexity*, notably due to the extensive duration of the overall program and sessions. Participants considered the amount of time during the week that program sessions were conducted insufficient, given its demanding nature. Additionally, the written components and complex, abstract language of the STEPPS content posed challenges.

The lengthy assessment protocol selected for the study were identified as a significant barrier, and challenges in conducting and comprehending the protocol were observed. Another obstacle was starting each session with the BEST questionnaire. The BEST is a 15-item questionnaire developed for the STEPPS program to assess the intensity of thoughts, emotions, and both negative and positive behaviors at the beginning of each session using a 5-point Likert scale [8, 13].

In terms of *Design Quality & Packaging*, the abundance of written content was perceived as a barrier. The overall dossier was highly regarded, especially for its practical sections. Notably, the program format was widely appreciated and recommended for future implementations.

The interviews yielded several recommendations to improve the manual. Key suggestions included adding more examples, specifying inmate strategies, and creating a cohesive narrative across sessions. Simpler, orally focused sessions with visual content were recommended, to be conducted in fewer but more frequent sessions. Continuity in implementing the program in Catalonia's PCs was also emphasized.

### Outer setting

In terms of addressing *Patients' Needs*, it was highlighted that there are professionals lacking knowledge about self-harm behaviors, and that a prevalence of beliefs about self-harm behaviors as instrumental behaviors to get

benefits and other stigmatizing thoughts surrounding these behaviors still persist.

A significant obstacle surfaced in the form of the diverse needs and characteristics of the inmates. A considerable proportion of them presented a dual diagnosis and elevated rates of impulsivity, which posed challenges to the implementation process. The presence of drug abuse and overmedication further complicated session attendance. The overarching disruptive profile, the low tolerance to frustration and diverse life experiences, occasionally hindered the uptake of the program as initially planned. In addition, challenges in comprehension and communication within the program were observed at times. It was regarded as a significant barrier when inmates exhibit cultural differences, such as Moroccan inmates, who perceive self-harm differently, which influences the program implementation. To illustrate it see examples in Supplementary material 3: Table S3.

*External Policies and Incentives* were revealed to be significant barriers in the implementation process. When inmates commit an infraction, they are transferred to a special high-security module where they are confined if high-risk is detected or when it is necessary to control certain behavior. These modules are known as the Special Management Unit (SMU). The regulations governing this specific module were highlighted as hindering factors in the implementation process. For instance, in this module, inmates are prevented from participating in treatment programs. Notably, professionals reported that individuals who were sent to SMU for engaging in self-harm behaviors were unable to access the STEPPS program to address this specific issue. In exceptional cases, when inmates in this module can attend treatment programs, it requires judicial authorization, making this facilitating action largely impractical. Regarding this barrier, professionals recommended various actions, such as scheduling punishment time in the SMU during the weekend, after the completion of the program, or facilitating actions that enable mobility (See one example in Supplementary material 3: Table S3).

### Inner setting

Several *Structural Characteristics* of CS in Catalonia were identified as barriers. Notably, inmates being sent to the SMU were underscored as problematic, primarily due to the professionals' lack of mobility and the inability for the patients to attend, resulting in potential psychological consequences.

Communication issues among peers within the organization were also detected under the domain of *Networks and Communications*. Considering the organizational *Culture*, the preference for regimental actions over treatment action was recognized as a significant

barrier. Conversely, a key facilitator was the regulation that patients who withdrew from the program were not adversely affected. Find one example in Supplementary material 3: Table S3.

In terms of *Implementation Climate*, several barriers were identified, particularly considering the ambivalence observed in inmates towards addressing self-harm behaviors and reducing them, as these behaviors may provide short-term reinforcement. However, it was noted that certain patients exhibited high levels of motivation, which facilitated program development. Professionals cited the absence of incentives in comparison to other programs as a hindering factor. The motivation demonstrated by professionals was identified as a key facilitator. Also, the *Tension for Change*, particularly the recognized need among professionals to address self-harm behavior, was a crucial facilitator in the implementation process.

Problems with the tangible fit were observed, detecting barriers regarding intervention *Compatibility*. A notable barrier was identified concerning one of the key components of the STEPPS program, the reinforcement team. Restricted access to telephones and the absence of daily contact with family or friends presented challenges in implementing this aspect of the program.

Additionally, compatibility issues impacted the existing workflow of the sessions were done at the same time that inmates had remunerated work, creating logistical challenges. The continuous movement of inmates across modules and centers further hindered the attendance to treatment programs.

The *Relative Priority* of the STEPPS program presented difficulties regarding fatigue and overlapping with other existing programs. Professionals reported also how professionals did not understand the importance and priority in addressing this problem in CS.

The non-institutional compensation of inmates who participated was perceived by professionals as an important facilitator, promoting intrinsic motivation among participants. Nevertheless, it was also considered that the validation of similar courses with overlapping content was an important facilitator in those centers that were able to do this action (*Organizational Incentives & Rewards*).

The adjustment of the STEPPS program to inmates' characteristics was perceived by professionals as an indicator and facilitator for the *Readiness for Implementation*, processes that were also facilitated by *Leadership Engagement*.

Regarding *Available Resources*, depending on the center and the professionals, both conducting the session in the same module or in a different one were considered as potential barriers and facilitators at the same time. The characteristics of the classrooms also influenced

the conditions of the physical space, either positively or negatively. In one center, the library was considered a key facilitator for the success of the implementation. Time was also identified as a barrier, with insufficient time being a noteworthy concern (example of professional opinion in Supplementary material 3: Table S3).

Finally, for one of the implementers, a barrier was the absence of previous training due to late incorporation in the project. Despite this, *Access to Knowledge and information* was generally considered a key element to enable the implementation of the STEPPS program.

Given the high prevalence and necessity of addressing self-harm behaviors, professionals recommended the creation of a specialized team of professionals dedicated uniquely to addressing this issue.

### Characteristics of individuals

In the qualitative interviews, only aspects corresponding to the *Knowledge and Beliefs about the Innovation* construct were discussed. Notably, the enthusiasm of professionals emerged as a key factor influencing the implementation process, either facilitating or hindering it. Implementers expressed that the attitude of other professionals not involved in the implementation toward the innovation posed a potential barrier. Conversely, those professionals who embraced the learning and implementation of the intervention played a facilitating role in the process.

The quantitative data provided additional insights into this domain. In this instance, all the examined aspects were perceived as facilitators by the implementers. These factors encompassed the knowledge and skills of professionals in self-harm intervention, particularly in the STEPPS program, together with a dedicated commitment to its application (*Knowledge and Beliefs about the Innovation*). Consistently, high levels of *Self-Efficacy* in administering the STEPPS program were reported.

Furthermore, implementers expressed a consensus that their colleagues exhibited a strong commitment to enhancing mental health care in the CS with a shared interest in continuous learning and development (*Individual Stage of Change*).

### Implementation process

Following the pre-established *Planning* for implementation, the demand for two therapists to work together was considered an important facilitator. Found two professionals claimed examples in Supplementary material 3: Table S3.

*Engaging* (adherence) with patients presented challenges, including internalized self-injury behaviors among inmates and skepticism towards the program's intentions, with perceiving it as serving the professionals'

interests rather than their own well-being. However, inmates displayed motivation and a genuine desire for change, which professionals identified as a significant facilitator.

In the implementation process, the support and collaboration of external researchers were highly valued, especially through bi-weekly supervision meetings (*External Change Agents*). These meetings facilitated *Reflection and Evaluation*, allowing for the monitoring of the implementation and adjustments as needed (Example in Supplementary material 3: Table S3).

During *Participants Innovation* selection, sometimes the wrong profile of participants was selected (e.g., candidates requiring suicidal risk intervention or not meeting the participation criteria), influencing adherence issues.

During program *Execution*, challenges arose in ensuring fidelity to the program, and excessive time spent on recruitment and program initiation led to a loss of participants from the sample.

## Discussion

This study aimed to assess the perceptions of CS' professionals regarding the implementation of the STEPPS program in addressing self-harm behaviors among inmates. A mixed-methods approach, incorporating both quantitative and qualitative methodologies, guided by CFIR, was employed to identify the determinants influencing the implementation process. In addition to identifying these determinants, this study also suggests implementation strategies based on professionals' recommendations together with the Expert Recommendations for Implementing Change (ERIC) framework [44].

The scientific evidence supporting the intervention and the knowledge acquired during this process emerged as key facilitators. However, certain adaptations are necessary to address the challenging aspects of the intervention, such as its length, abstract vocabulary, and complexity. In this case, for Catalonian correctional facilities, a duration of 16 sessions was ultimately established without modifying any of the psychological components. Recommendations by professionals regarding program content suggest considering adaptations that incorporate more visual and oral content while reducing sessions and complexity. Taking into account the recommendation of experts in this specific context with expertise in the STEPPS program is expected to increase the normalization of the intervention [45].

The characteristics of the patients significantly impacted the implementation process. These conditions posed challenges in classification according to the CFIR framework. The framework primarily focuses on the delivery side, whereas in this case, the receiver side was equally important [30, 44]. To appropriately consider the

reach of the intervention, it was recommended to assess the fit and alignment of the intervention with the sample. Consultation with the CFIR support team was undertaken to address these labeling difficulties. For future considerations, the use of updated CFIR models was recommended, as these factors were deemed essential and included in the supplementary material Outcomes Addendum [29]. Nevertheless, the interaction of the sample with the innovation outcomes was considered, highlighting high comorbidity rates, substance abuse problems, and impulsivity traits as hindering factors. These challenges are in line with existing literature findings [46, 47].

Policies established in the correctional system in Catalonia have hindered the implementation process by restricting access to the program when punitive measures were established. The executive and legislative independence of Catalonia may offer opportunities for some facilitators. Initial steps could involve informing and building awareness through collaboration with the institution. Working together with the head of the correctional services to advocate for adaptations to these policies is crucial [44].

The knowledge and beliefs held by both professionals and patients are highlighted as significant determinants with the potential to influence the implementation process positively or negatively. These include ambivalence to change, stigma through self-harm behaviors, and the perceived need for treatment, among others. Existing literature underscores the critical role of these factors in implementing interventions within CSs [48]. Psycho-educational meetings emerge as a potentially essential facilitator in addressing these factors [44]. Additionally, there is a specific demand from professionals for the training of correctional officers and peers to support the implementation process. These implementation strategies are closely linked to an essential determinant suggested by professionals, which refers to including other professionals, such as nursing teams and prison officers, in the process, or even establishing specialized teams or stakeholder groups to address self-harm behavior [49]. Adequate personal support is imperative to ensure effective implementation [18].

Facilities emerged as a controversial determinant in the implementation process. Both the characteristics of the modules and the specific rooms where the program was conducted played crucial roles in terms of attendance. Moreover, the high rate of mobility within modules and centers posed significant challenges to adherence and program continuity. These issues are widely recognized as common obstacles [20]. Effective implementation strategies must be put in place, taking into account the considerations of each team of professionals involved.

To address some of the challenges encountered during the process, two therapists assumed shared responsibility and provided crucial support throughout the implementation, which ultimately proved to be a significant facilitator. Additionally, the meetings and support from the external research team were noted to have a significant positive impact in overcoming obstacles, facilitating implementation, and fostering a sense of accompaniment throughout the process.

In general, these present a summary of the most prominent determinants identified throughout the evaluation. However, it is crucial to acknowledge that none of these factors operate in isolation, and their interplay varies. Therefore, it is essential to continue monitoring them closely. Additionally, when implementing the suggested changes and facilitators, assessments should be conducted to evaluate their impact on the implementation success.

As far as we know, this study represents the first attempt to address self-harm behaviors within CS while considering the determinants influencing the implementation process. Moreover, it offers strategies to overcome challenges and facilitate the implementation process itself. Given the urgent need to address mental health issues in such complex environments, studies focusing on determinants are imperative [25, 50]. What is more, this is the first time that the STEPPS program has been used in PCs in Spain.

The study was particularly enriched by the use of a highly cited and established framework, CFIR. Furthermore, a more comprehensive approach was achieved through the use of mixed methods, which provided a more accurate understanding of the implementation process.

These findings should be interpreted within the context of certain limitations. One aspect is the specificity of the context, although being a strong point of the study may limit the generalizability of the results to other contexts or cultures. Therefore, these results should be considered as a background or guide rather than deterministically applicable across all settings.

Regarding the implementation process, the involvement of researchers during the training phases and follow-up sessions may have influenced the process itself. Therefore, the results should be interpreted with this human factor in mind.

Although another of the strengths of this study was the use of the CFIR framework, some difficulties were encountered in labeling aspects related to patients according to CFIR constructs. For future studies, using an updated version of the framework may aid in more easily establishing these aspects. As with all qualitative studies, there is a potential for subjectivity in the coding

process, as the professionals interviewed could influence the interpretation of the results. Incorporating additional perspectives would further enrich the findings. To address this concern, multiple coders were involved in the analysis, and coding decisions were cross validated to enhance reliability. Moreover, the qualitative data was complemented with quantitative information to ensure greater rigor and completeness in the study's conclusions.

Finally, future studies should focus on implementing strategies to overcome the identified barriers and establishing continuous assessment mechanisms to implement the STEPPS program successfully until it becomes a normalized service. This may involve adapting the program's content and materials to better fit the needs of the target population. Additionally, exploring if the current findings can be generalized to other regions of Spain or other countries would be valuable for guiding broader implementation efforts.

This study explored the diverse determinants influencing the treatment of self-harm behaviors within correctional settings, recognizing the urgent need to overcome scalability problems. Ultimately, the study pretends to address mental health issues, promoting EBPP, an essential part of the correctional structure.

#### Abbreviations

BPD	Borderline personality disorder
CFIR	Consolidated framework for implementation research
CQR	Consensual qualitative research
CS	Correctional settings
EBPPs	Evidence based psychological practices
ERIC	Expert recommendations for implementing change
FGDs	Focus group discussions
IS	Implementation science
SD	Standard deviation
SMU	Special management unit
STEPPS	Systems training for emotional predictability and problem solving

#### Supplementary Information

The online version contains supplementary material available at <https://doi.org/10.1186/s12889-025-21519-8>.

Supplementary Material 1.  
Supplementary Material 2.  
Supplementary Material 3.

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#### Authors' contributions

X.B-H and B.F oversaw the recruitment, training, and management of both the centers and professionals involved. R.L-C and AG-P conducted the professionals' training and provided supervision during the program implementation. R.L-C lead qualitative interviews. Subsequently, R.L-C and IJ jointly coded

qualitative data, with conflict resolution managed by A.G-P. I.J conducted data analysis and interpretation. R.L-C formatted the manuscript to journal specifications, and I.J handled the submission. All authors reviewed and approved the final manuscript.

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### Data availability

The data includes transcripts of all interviews, which contain sensitive information about the situation in Penitentiary Centers in Catalonia. Access to the transcripts will be provided upon request to the authors.

### Declarations

#### Ethics approval and consent to participate

The study was approved by General Directorate of Penitentiary Affairs from the Government of Catalonia Department of Justice Rights and Memory (Code = Steppscps) (1 June 2022). Informed consent to participate obtained from all study participants.

#### Consent for publication

Not applicable.

#### Competing interests

The authors declare no competing interests.

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