

Counsellors' Experiences of Care and Challenge in Anonymous Gambling Helplines

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Supporting individuals affected by gambling harm prioritizes anonymity, confidentiality, and accessibility as fundamental ethical and technical constraints. As a result, anonymous helplines have emerged as a primary access point for help-seekers to obtain professional support from counsellors. However, from counsellors' perspectives, it remains unclear whether existing ubiquitous computing systems can deliver effective interventions while operating under the technical constraints required to protect vulnerable populations. To address this gap, we conducted semi-structured interviews with 13 professional counsellors working in Macao's gambling harm helpline sector to examine how they navigate trade-offs between vulnerability protection and usability within anonymous helpline models. Our findings show that while privacy protection is essential for enabling help-seeking, it also constrains counselling effectiveness, efficiency, and satisfaction. Counsellors additionally face challenges related to managing their own privacy boundaries, sustaining professional development, and integrating emerging technologies into intervention practices. Together, these findings surface key sociotechnical tensions in ubiquitous computing in healthcare under constrained helpline contexts and inform the design of future helpline systems that aim to support vulnerable populations through accessible, trustworthy, and sustainable digital interventions.

CCS Concepts: • **Security and privacy** → **Social aspects of security and privacy**; **Usability in security and privacy**; • **Human-centered computing** → **Empirical studies in HCI**.

Additional Key Words and Phrases: Usability, helpline, privacy

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1 INTRODUCTION

As healthcare technologies continue to evolve, ubiquitous computing technologies, which seamlessly integrate into people's daily interactions, have shown significant promise in transforming healthcare delivery.[69]. Applications of ubiquitous computing in healthcare help uncover associations between digital data, clinical measurements, disease risk, and well-being [2]. However, not all healthcare settings can support such data-intensive and highly integrated forms of technological intervention. In healthcare contexts involving vulnerable populations, social stigmatization often shapes care-seeking priorities [116]. As a result, avoiding exposure and limiting disclosure become primary concerns for those seeking care [80]. When designing ubiquitous computing technologies for healthcare in support of vulnerable populations, widely adopted design principles, such as continuous data collection and increasing data use, are therefore often difficult to sustain. In these settings, ubiquitous computing in healthcare becomes constrained, as systems must prioritize protecting vulnerable individuals and avoid introducing new ethical, social, and operational risks [97].

Gambling harm helplines represent a particularly good example of a technologically constrained healthcare context. As a serious public health issue, gambling harm is heavily stigmatised, with affected individuals often stereotyped as “greedy” or “morally weak” [62, 94]. Concerns about discrimination and social exposure discourage identity disclosure among individuals experiencing gambling-related harm, which in turn limits the collection, linkage, and reuse of personal data within computational systems [98]. In addition, help-seeking for gambling harm often occurs only when situations become critical, constraining the applicability of technologies that require prolonged onboarding or sustained engagement [90]. Under these combined constraints, gambling helplines are commonly delivered through everyday communication infrastructures such as telephone and messaging platforms [37]. These technologies are applied for their seamless integration into daily life, providing low-threshold access outside formal care settings while also meeting the need for low-exposure interactions. In this way, gambling helplines can be understood as a constrained form of ubiquitous computing in healthcare, rather than as general digital technologies. These services leverage distributed computing infrastructures to provide real-time and anonymous access to professional counsellors, and have been shown to effectively mitigate gambling-related harm [35, 42, 44, 81].

Although technology-mediated helplines provide critical support for vulnerable help-seekers, a core unresolved question remains: how can ubiquitous computing in healthcare support clinically meaningful care while protecting vulnerable individuals when common design resources are constrained? In stigmatised contexts, helpline systems must prioritize anonymity, confidentiality, and accessibility as fundamental ethical and technical requirements [66]. At the same time, gambling helplines rely on trained counsellors to deliver multiple professional psychological care [42]. The need to protect vulnerable populations, therefore, constrains system design, while counsellors simultaneously require richer system support to deliver effective care, creating a tension between vulnerability protection and clinical utility. Prior research on gambling helplines has primarily focused on help-seekers' motivations, usage patterns, and outcomes [18, 21], while studies on technology-mediated support for vulnerable populations have generally overlooked how context-specific constraints shape system design [22, 74, 112]. As a result, little is known about how counsellors engage with the affordances and limitations of ubiquitous computing while delivering healthcare in constrained settings.

To address these gaps, our study uses gambling helplines as a case to examine how vulnerable populations are supported through constrained, technology-mediated helpline systems. This case highlights for Interactive, Mobile, Wearable and Ubiquitous Technologies (IMWUT) how ubiquitous computing in healthcare is reshaped by privacy protection requirements and the need for accessible, technology-mediated support. We investigate gambling helpline services from the perspective of counsellors, focusing on two key aspects of their experiences. First, when supporting vulnerable individuals through constrained helpline systems, we examine how counsellors perceive the usability of gambling helpline systems—specifically, whether these systems facilitate or hinder the

delivery of psychological interventions while protecting individuals affected by gambling harm. This leads to our first research question (RQ):

- **RQ1:** How do counsellors perceive the usability of helpline systems in supporting gambling-harmed individuals?

Second, we examine the broader challenges counsellors encounter when conducting intervention work within constrained, technology-mediated helpline system. Helpline interventions involve complex forms of work, including managing uncertain and incomplete information, responding to fluctuating risk levels, and performing intensive emotional labour within distributed, time-pressured, and emotionally charged environments [28]. Such challenges arise not only from system design, but also from the sociotechnical, organisational, and emotional conditions that shape how care is delivered and sustained in practice. Accordingly, we propose our second RQ:

- **RQ2:** What challenges do counsellors face when they work to support individuals through gambling helplines?

We conducted semi-structured interviews with 13 gambling helpline counsellors in Macao, the world's leading gambling hub, which has a well-established system of gambling support services [60]. We aimed to explore counsellors' perceptions of helpline usability and the challenges they encounter during intervention.

We first examine helpline counsellors' perceptions of the usability of gambling helpline systems in supporting gambling-harmed individuals (RQ1). Our analysis draws on three commonly used dimensions in usability research: effectiveness, efficiency, and satisfaction [40]. Regarding **effectiveness**, counsellors acknowledged that the helpline model enables multi-dimensional assessment of help-seekers' urgency. However, they also recognised its lack of functions in addressing privacy concerns and supporting more advanced therapeutic techniques. Regarding **efficiency**, counsellors appreciate that helplines enable safe and timely interventions and facilitate the exchange of supporting materials in complex cases. Nevertheless, they noted that current systems offer limited functionality to mitigate communication barriers related to language and cultural differences. Regarding **satisfaction**, counsellors highlighted that existing communication modes generally make interactions comfortable for gambling-harmed individuals. Yet they also reported that the intensity of real-time communication can be mentally exhausting, raising concerns about the sustainability of emotional labour over time.

Next, we investigate the challenges counsellors face when supporting gambling-harmed individuals through gambling helplines (RQ2). These challenges extend beyond the usability of specific systems, reflecting the multi-layered sociotechnical context of helpline work. Our analysis identifies three major areas of concern. First, at the individual level, counsellors express tensions between maintaining personal privacy and delivering effective interventions. Second, at the organisational level, they highlight insufficient training and institutional support to address the complex needs of gambling help-seekers. Third, at the technological level, counsellors view emerging digital tools with ambivalence, acknowledging their potential while also raising ethical and practical concerns.

Based on these findings, we further examine the constraints that supporting gambling-harmed individuals poses for ubiquitous computing in healthcare. We show how these constraints challenge counsellors' ability to deliver effective interventions during helpline interactions. We then present a set of design implications that respond to these challenges at both interactional and organisational levels. These implications focus on how helpline systems built on everyday communication infrastructures can be better designed to better support effective intervention delivery while also sustaining counsellors' long-term work under the structural limitations of gambling helpline contexts.

This work makes two contributions to the IMWUT community. First, this work contributes to ubiquitous computing in healthcare by examining gambling helplines as a constrained case of technology-mediated care from counsellors' perspectives, an under-examined viewpoint in prior research that has predominantly focused on help-seekers. Our study reveals how tension between vulnerable protection and clinical utility constraints jointly shape counsellors' intervention work. Second, beyond the specific context of gambling helplines, this

work contributes a broader account of how ubiquitous computing in healthcare is reshaped in stigmatised and privacy-sensitive care settings. We show that usability challenges and design trade-offs arise not simply from the absence of more advanced technologies, but from fundamental constraints on data practices and interaction. In this way, our study provides transferable insights for understanding these tensions and guiding design in other constrained, technology-mediated care contexts.

2 BACKGROUND

In this section, we provide background information on gambling harm and its intervention processes.

2.1 Gambling Harm

Gambling systems are typically designed to ensure long-term profitability for the house, while players are systematically placed at a disadvantage [99]. The process activates the brain's reward system of players, releasing dopamine, which reinforces the thrill of winning and fuels impulsive behaviour and loss-chasing, ultimately leading to a loss of control [90]. Gambling harm has been recognised as a significant global issue due to its widespread prevalence [98], with approximately 5.5% of women and 11.9% of men worldwide experiencing some level of harm [82].

Gambling harms can be categorised into the following six key areas: **1) Financial constraints:** Gambling-related financial losses often severely limit individuals' ability to access professional help, leading many to rely on free or low-threshold support services such as helplines [55]. **2) Marginalisation from stigmatisation:** Negative social perceptions of gambling can discourage individuals from disclosing their behaviour or seeking help in digital spaces due to the fear of judgment or social exclusion [52, 99]. **3) Legal and regulatory risks:** In jurisdictions where gambling is illegal or heavily regulated, individuals may avoid seeking assistance due to concerns about legal consequences or exposure [113]. **4) Mental and physical health problems:** Gambling can lead to psychological issues such as anxiety and depression, along with physical problems like sleep disruption and self-harm [63]. **5) Disruption of relationships:** Problem gambling often damages intimate and familial relationships, leading to conflict, emotional distance, or even domestic violence [6, 62]. **6) Harms to social stability:** Widespread gambling can contribute to social instability through increased debt, crime, and the involvement of youth in gambling [29].

2.2 Gambling Helpline and Intervention Process

Despite the severe harms associated with gambling, help-seeking rates among affected individuals remain strikingly low—fewer than 10% seek professional support, primarily due to public stigma and the fear of being labelled or judged [90]. Consequently, many individuals seek help only after the harm has become substantial, such as when financial, relational, or psychological problems have already escalated [36].

Among the available support options, helplines have become a primary channel for individuals affected by gambling harm. Their accessibility, anonymity, and low barrier to entry make them particularly suited to those deterred by stigma or reluctant to engage in face-to-face services [28]. Everyday communication infrastructures such as telephones, text messaging, and instant messaging applications are applied in gambling helplines. These technologies, being seamlessly integrated into daily life, provide low-threshold, low-exposure access to support outside formal care settings. In this way, gambling helplines can be understood as a constrained form of ubiquitous computing in healthcare, rather than as general digital technologies.

Reflecting the global recognition of gambling harm, more than 80 regions worldwide have established dedicated gambling helplines to provide immediate psychological and informational support [28]. These helpline systems can be broadly categorised into two main models, based on their service roles and delivery structures [18].

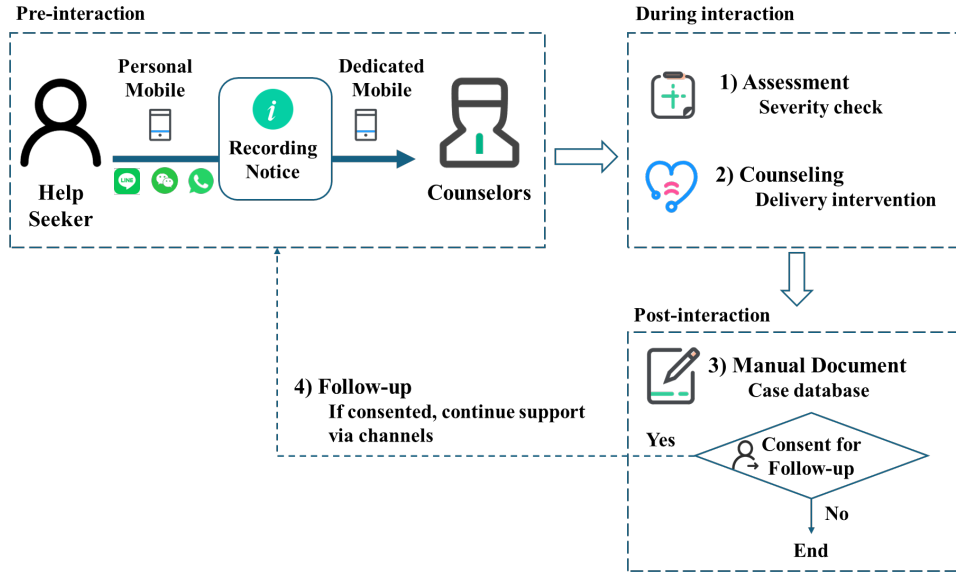


Fig. 1. Workflow of gambling helpline intervention process. In the pre-interaction stage, help-seekers access the service through phone and messaging platforms and receive a recording notice. During the counselling encounter, the on-duty counsellor provides support through these communication channels. In the post-interaction stage, counsellors document the case, and follow-up is determined by whether the help-seeker consents to continued support through the same channels.

(1) Referral-focused helplines: Primarily serve as access points, guiding users to external treatment services. These helplines typically offer brief support, information, and referrals, without delivering in-depth therapeutic interventions. Communication channels often include telephone hotlines, SMS, online chat, and email. This model is common in regions such as the US and Canada (North America) [18], Sweden, the UK, and Finland (Europe) [37, 126], and South Korea (Asia) [128]. Because intervention work is delegated to external professional services, referral-focused helplines offer highly scalable, low-friction access points, but often suffer from interaction breakdowns and a lack of longitudinal, context-aware support once users are handed off to external systems.

(2) Intervention-integrated helplines: Provide not only initial support and referral but also deliver direct interventions. These helplines typically use multi-channel communication and may incorporate in-person counselling as part of a hybrid care model. This approach is found in Australia and New Zealand (Oceania) [18] and in Singapore, Hong Kong and Macao (Asia) [8, 18]. By directly delivering interventions within the same service infrastructure, intervention-integrated helplines enable closed-loop, context-aware, and longitudinal support; however, this integration introduces substantial challenges in scalability, system complexity, and data ethics.

The **existing helpline system and counselling workflow** used in Macao gambling helpline services is depicted in Figure 1. The workflow can be broadly divided into three stages:

- **Pre-interaction: Access and intake.** The helpline operates through mobile telephony and real-time messaging platforms, which serve as the primary points of entry for help-seekers. Individuals can initiate contact either by calling the helpline or by messaging through widely used platforms such as WeChat, WhatsApp, or LINE. Upon connection, help-seekers are informed—via prerecorded voice messages or standardized text prompts—that their interactions may be recorded.

- During interaction: Counselling encounter.** Counsellors deliver 24-hour support through shift-based work. The on-duty counsellor interacts with help-seekers using organisation-provided infrastructure, including fixed-line telephones and dedicated work smartphones connected to official helpline accounts on supported messaging platforms.
 During sessions, counsellors may view limited identifying information—such as phone numbers or messaging account identifiers—as a byproduct of routine platform use. Counselling typically begins with an initial assessment to evaluate the severity of gambling-related harm, following established professional standards [89]. This is followed by counselling interactions grounded in Cognitive Behavioral Therapy (CBT) and Motivational Interviewing (MI) [17, 44, 81]. At the end of each interaction, counsellors ask whether the help-seeker is willing to receive continued support.
- Post-interaction: Documentation and follow-up.** After each interaction, counsellors manually record essential case information in a case management database that contains only minimal attributes (e.g., severity level, region, prior contact history). Collected recordings are stored in a separate system that is not integrated with the case management database. To meet strict privacy protection requirements, these systems are deliberately kept offline and non-networked, limiting cross-system data access and integration. If the help-seeker agrees to continued support, follow-up sessions may be conducted over subsequent months through the same helpline communication channels.
 Counselling data are treated as confidential and may be disclosed to external agencies only with user's consent or in crisis situations. All data collection and processing are governed by Macao law, including regulations on cross-border data transfer when users access the service from outside Macao.

3 RELATED WORK

Ubiquitous computing refers to computing embedded in people's everyday movements and interactions with their physical and social environments [69]. It may be realized through ubiquitous technologies such as wearable computing [93], Internet of Things (IoT) [83], and mobile computing [14, 54]. Healthcare is one important domain in which such technologies have been widely studied and applied [3]. We situate our study within two bodies of literature relevant to ubiquitous technologies in healthcare. First, we review how these technologies have been applied in the specific context of gambling harm, examining computational approaches ranging from preventive mechanisms to helpline-based interventions. Second, we examine research on ubiquitous technologies that support frontline care for vulnerable populations, focusing on how these systems mediate risk and professional care practices.

3.1 Ubiquitous Technologies for Supporting Gambling Harmed Individuals

Gambling harm has been recognised as a significant global issue due to its widespread prevalence [98]. Prior research on supporting individuals affected by gambling harm has primarily focused on mitigating such harm through ubiquitous technologies embedded in gambling environments and help-seeking contexts. This includes prevention through the design optimization of electronic gambling machines, as well as intervention through technology-mediated support channels such as helplines.

Prevention strategies implemented through electronic gambling machines primarily focus on optimizing interactive features to reduce the likelihood of irrational gambling behaviours, thus preventing severe gambling-related harm [7, 36, 98], as introduced in Section 2.1. These strategies include static warning labels [47, 78, 79], personalized pop-up messages [61], and mandatory play breaks [9–11, 56].

Intervention research has identified helpline services as a primary delivery model, valued for their accessibility and anonymity [35]. Existing studies on gambling helplines have largely focused on the characteristics and motivations of help-seekers in different regions [63, 72, 91], as well as the operational aspects of helpline

services [45], including efforts to develop standardized data collection practices for gambling helplines [73]. Research consistently demonstrates that professional support from helplines is crucial for individuals experiencing gambling problems [42, 103]. For example, brief and intensive telephone interventions have been shown to help problem gamblers reduce both the frequency and amount of their gambling [1].

Prior research has highlighted the importance of gambling helplines—especially for individuals at heightened suicide risk who require strong privacy protection [52, 122]—but has also noted that helpline interventions are often less effective than face-to-face services [114]. Much of the existing work has focused on understanding help-seekers' motivations [72, 91] or evaluating help-seekers' satisfaction with helpline models [105]. While a few studies have explored service providers' views, they have primarily examined the general challenges of gambling addiction counselling [53], leaving the usability of helplines as a delivery mechanism largely unexplored from the provider perspective. This study fills this gap by examining the perspectives of gambling helpline service providers, focusing on their perceptions of helpline usability and the challenges they face in practice.

3.2 Ubiquitous Technologies Supporting Frontline Care for Vulnerable Populations

Individuals affected by gambling harm often face elevated risks such as financial instability, social stigma, and mental health challenges [94]. These conditions resonate with broader research on vulnerable populations, commonly defined as those exposed to heightened physical, cognitive, emotional, or social risks [87]. Within ubiquitous computing, research on frontline care for vulnerable populations has focused on three main areas: first, the risks individuals face when engaging with ubiquitous computing systems; second, how such technologies can empower individuals to support themselves; and third, how these technologies facilitate access to external professional support.

Prior research identifies vulnerability across societal, relational, and individual levels. At the societal level, vulnerabilities arise from structural inequities and stigma, as observed among refugees [110], LGBTQ+ communities [31], and women constrained by cultural expectations [4]. Relational vulnerabilities often stem from power-imbalanced dependencies, such as survivors of intimate partner violence (IPV) [15, 26, 51], or from care-giving relationships involving children and elders [13, 39, 127]. At the individual level, vulnerability may involve high public visibility, limited accessibility, or economic and informational disadvantage [50, 59, 64, 76].

A substantial body of ubiquitous computing research has explored how technologies can support vulnerable populations [16]. Much of this work focuses on mitigating risks faced by individuals through protective system design, including privacy-preserving technologies [68, 125, 129], or trauma-informed approaches to computer security interventions for IPV survivors [96]. Other studies examine how ubiquitous computing-based health systems support individuals with serious mental illness [5, 25, 108, 124], as well as educational interventions that foreground marginalized and vulnerable populations in security and threat modeling contexts [109].

Beyond self-support and protection, ubiquitous computing technologies play a critical role in enabling external frontline support [27, 120, 132]. Prior research on frontline support work has examined how technologies mediate care delivery for clients formally enrolled in stable service organisations, such as people experiencing homelessness, individuals living with HIV, and residents of shelters [22, 74, 112]. This work highlights how frontline workers navigate institutional constraints, data infrastructures, and ethical tensions while supporting highly vulnerable clients. Related research has also examined remote patient care, particularly teletherapy, where ubiquitous computing technologies enable synchronous therapeutic encounters [101]. Following the COVID-19 pandemic, studies have documented the challenges clinicians face when transitioning from in-person care to video-based teletherapy, including difficulties related to rapport-building, embodiment, and cultural competence [19, 101]. Building on this line of work, Robledo Yamamoto et al. [102] propose a cultural competence framework to inform the design of teletherapy systems.

Prior work has shown that vulnerable populations may face heightened risks and has emphasized the importance of frontline care in mitigating these risks [104, 130]. However, research on frontline care for vulnerable populations mediated by ubiquitous computing systems has largely focused on institutional settings or stable, ongoing care relationships [19, 22, 74, 101, 112]. Much less is known about how frontline care is delivered to help-seekers outside institutional settings, particularly in fully remote, urgent, and anonymous encounters where no prior care relationship exists. Yet such forms of help-seeking are common in vulnerable population contexts, where risks are often shaped by structural inequities and social stigma [92, 125]. This study addresses this gap by examining gambling helplines from counsellors' perspectives, focusing on how ubiquitous computing systems mediate frontline care in contexts where strong protections for vulnerable individuals are in tension with the need to provide effective professional care.

4 METHOD

In this section, we outline the methodology of our study, which was conducted through semi-structured interviews. Ethical considerations were prioritized throughout the research process. The study was approved by the Institutional Review Board (IRB) at the University of Macao and adhered strictly to IRB guidelines to ensure ethical conduct. Our research team brings substantial expertise to this topic: one member has extensive experience supporting individuals affected by gambling harm, while others have a strong research background in ubiquitous computing.

We selected Macao's gambling helpline services as the focus of our study, as Macao is the largest legal gambling jurisdiction in Asia and one of the largest globally [67], with a well-established helpline system. Fourteen institutions in the region provide direct intervention services [60]. The Macao helpline system is diverse, offering 24/7 gambling-specific helplines, general crisis lines, and services tailored for specific groups, such as gambling industry workers, youth, and individuals from different religious backgrounds. These services combine multi-channel communication (phone, online chat, social media) with in-person counselling, with approximately 90% of help-seeking contacts made via phone or social media [72]. In terms of demographics, the majority of helpline users are from Macao (60%), with the remainder primarily from mainland China and Hong Kong [72]. We believe that conducting this research in Macao provides a valuable context for studying practical interventions.

4.1 Participant Recruitment

To recruit counsellors from local gambling helpline organisations in Macao, we contacted the official department responsible for gambling harm interventions through our team's connections. Additionally, we reached out to the 14 organisations listed in the official directory via email to request interviews. To ensure participants could provide reflective insights into the strengths and limitations of the service model, we asked organisations to recommend experienced counsellors. Ultimately, we recruited 13 counsellors from 5 organisations. Interviews were conducted between January and May 2025, either via Skype or in person. Each interview lasted 60 to 90 minutes [58]. All participants were informed about the study's procedures and data protection policies. Financial compensation was offered but declined by participants, who perceive the study's potential contribution to improving their care practices as a sufficient incentive for participation.

Chinese is one of the official languages in Macao [70], and proficiency in Mandarin is a professional requirement for gambling helpline counsellors. Accordingly, all interviews were conducted in Mandarin by a native speaker, audio-recorded with consent, and transcribed verbatim. To preserve linguistic nuance, data analysis was performed directly on the original Mandarin transcripts; selected quotes were subsequently translated into English and verified by bilingual researchers to ensure conceptual equivalence [57].

Due to the small number of helpline counsellors in Macao, disclosing detailed demographic information for each participant could risk identification. Therefore, in accordance with participants' requests, we did not

include individual-level demographic tables but present aggregated demographic statistics instead. Specifically, nine participants are male, and four are female. Three participants hold a master's degree, and ten hold a bachelor's degree. The participants represent five institutions, with three in managerial positions. Regarding work experience, the minimum is 5 years, the maximum is 14 years, with an average of approximately 9 years. Regarding institutional differences, Institution A is a 24-hour general crisis helpline; Institution B specialises in gambling counselling and operates 24 hours; Institution C is the official government support organisation for individuals affected by gambling harm; Institution D supports professionals in the gambling industry who experience gambling harm; and Institution E focuses on mental health services for Macao youth. Detailed demographic statistics are provided in Table 1.

We acknowledge the small sample size of our study; however, we argue that it provides unique and valuable insights by capturing the perspectives of a rare and underrepresented group: experienced helpline counsellors. These counsellors are inherently scarce resources—Macao's small population base [20] and the high turnover rate in the counselling field [?] contribute to this scarcity, despite the region's relatively extensive network of gambling harm intervention services. Additionally, prior studies investigating the perspectives of experienced digital mental health support counsellors have used similarly small samples, typically involving 11 or 12 participants [5, 111], consistent with our sample size. Thus, despite the small sample, the study's focused scope and in-depth interviews provide sufficient support for its conclusions.

Table 1. Participants' demographic statistics.

Gender		Age	
Male	9	Below 30	3
Female	4	31–35	6
Education		Institution	
Bachelor's degree	10	Above 35	4
Master's degree	3	Institution A	4
Working Experience		Institution B	4
5–7 years	3	Institution C	1
8–10 years	4	Institution D	2
More than 10 years	6	Institution E	2

4.2 Interview Protocol

Our interview protocol was structured into three sections, as provided in Appendix A. First, we collected participants' background information to understand the types of privacy-related data typically involved in helpline services [48]. This included demographic details, work experience, and their institutional context, such as operational models, daily routines, and workflows for supporting individuals affected by gambling harm. We also asked participants to describe the types of information they typically gather from help-seekers during professional interventions. Sample questions included: "How do you typically provide intervention to help-seekers?" and "What kind of information do you need to know for supporting your intervention work?"

Second, we explored participants' perceptions of helpline usability (RQ1) in the context of heightened privacy sensitivity. This section aimed to understand how privacy concerns among help-seekers influence counsellors' interventions. Building on the work processes identified in the first section, we asked participants to reflect on their experiences with different helpline channels. Sample questions included: "How do you feel about using different channels for intervention?" and "Do you think any particular channel is more usable for your work?" This approach was designed to avoid steering or biasing their initial perceptions while providing a comprehensive

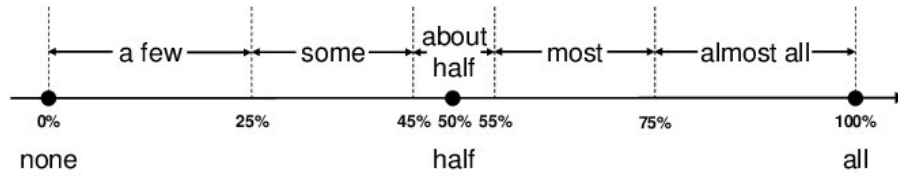


Fig. 2. The terminology we use to report the percentage of participants in Section 5 and 6.

framework for further reflection. As the interviews progressed, we probed deeper with follow-up “why” questions to explore the reasoning behind different usability perceptions.

Finally, we asked participants to discuss the challenges they faced when using helplines for psychological interventions (RQ2). We also inquired about their suggestions for improving current technological models. After participants shared their responses, we followed up with questions about specific emerging technologies highlighted in prior research [85, 86, 108, 111] to understand their views on the potential application of these technologies in intervention work.

4.3 Interview Data Analysis

All interviews were audio-recorded with the informed consent of the participants and subsequently transcribed for analysis. We conducted the thematic analysis to systematically interpret the data [23, 49]. Initially, 20% of the interview data was independently coded by two researchers using an inductive open coding approach [24, 46]. Each researcher conducted a preliminary thematic analysis to identify themes related to the research question. This process involved an in-depth reading of the transcripts, followed by the identification and labelling of relevant segments discussing the perception of usability and challenges from helpline counsellors. After the initial coding phase, the two researchers compared their themes, identifying similarities and differences in interpretation. Through iterative discussion, they developed a comprehensive codebook to guide the analysis of their usability perception and challenges during the helpline intervention for individuals suffering from gambling harm. To ensure the reliability of the codebook, an additional 10% of the interview data was randomly selected for coding. Both researchers independently applied the codebook to this subset, and inter-coder reliability was assessed using Cohen’s Kappa [75]. The resulting Kappa value of 0.87 indicated strong agreement and confirmed the consistency of the coding framework. The remaining 70% of the interview data was then coded collaboratively by the two researchers using the validated codebook. Throughout this process, they regularly discussed findings, addressed discrepancies, and refined the analysis to ensure a rigorous and reliable thematic coding. During the later stage of analysis and synthesis, we observed that the emergent themes aligned well with the three usability dimensions of effectiveness, efficiency, and satisfaction proposed in prior research [40]. We therefore adopted this well-established model as an interpretive and organisational framework for reporting the findings, rather than as an a priori analytical template. The final codebook is provided in Appendix B. To validate the comprehensiveness of our data, a saturation analysis was conducted. Emerging themes were catalogued in the order of appearance from participants P1 through P13. Data saturation was reached after the 11th interview, with two additional interviews conducted to confirm and consolidate this saturation. The absence of novel themes in the later interviews confirmed that we had achieved data saturation [41, 107].

Given the qualitative nature of the study, we refrained from reporting the exact number of participants when presenting the frequency of participants’ responses; instead, we adopted a consistent terminology (similar to prior work [30, 34]) to present the relative sense of such frequency, as illustrated in Figure 2.

5 COUNSELLORS' PERCEPTIONS OF USABILITY OF GAMBLING HELPLINE SYSTEMS IN SUPPORTING GAMBLING-HARMED INDIVIDUALS

In this section, we examine helpline counsellors' perceptions of the usability of gambling helpline systems in supporting gambling-harmed individuals (RQ1). Specifically, we focus on how counsellors experience constrained helpline systems and whether these systems facilitate or hinder the delivery of psychological interventions while protecting vulnerable individuals. Our findings are organised around the three widely used dimensions of usability research—effectiveness, efficiency, and satisfaction [40].

5.1 Perception of Effectiveness of Helpline

Effectiveness refers to the accuracy and completeness with which users achieve specific goals [40]. In the context of gambling helplines, we examine how counsellors perceive the system's ability to support accurate assessment and comprehensive intervention for help-seekers.

Counsellors expressed mixed perceptions of system effectiveness: on one hand, they reported that technical constraints limited their ability to conduct thorough diagnoses and interventions with high-stigma help-seekers; on the other hand, they noted that the helpline system also provided valuable contextual cues from digital interactions that enhanced their understanding of help-seekers' situations.

5.1.1 Insufficiency in Addressing Privacy-Driven Information Withholding. Counsellors consistently reported that existing ubiquitous computing technologies offer limited support for addressing help-seekers' privacy concerns, which in turn undermines both the effectiveness and efficiency of intervention work. Individuals reaching out to gambling helplines often exhibit strong privacy concerns and adopt various protective behaviours to safeguard their anonymity [94]. However, existing gambling helpline designs lack sufficiently interactive mechanisms to support help-seekers' perceived need for privacy. As a result, some individuals choose to remain completely anonymous, which hinders the establishment of continuous intervention relationships. Others may conceal or downplay critical details during interactions, further reducing the precision of counselling efforts. Together, these factors create information gaps that constrain counsellors' ability to accurately assess and respond to help-seekers' needs.

Help-seekers may adopt additional anonymity-supporting technologies to ensure their identities remain concealed. Some counsellors observed that although communication channels such as public phones or anonymous web-based chat tools enhance anonymity, they also make it difficult to establish continuity of care or provide sustained support over time. *"Some help-seekers use public phones to make calls, so we have no way to follow up"* (P04). Counsellors explained that this "one-off" contact pattern significantly undermines efficiency. Each conversation begins as a standalone event, requiring counsellors to rebuild rapport and recollect background information from scratch [118]. Without persistent records or identifiers, subsequent counsellors, especially in shift-based work, cannot access prior interactions. This leads to repetitive questioning, fragmented case histories, and inconsistent intervention strategies [117]. This lack of continuity consumes additional time and cognitive effort while reducing the overall effectiveness of helpline operations.

Additionally, help-seekers often withhold or downplay critical information under the current confidentiality model, which relies primarily on counsellors' verbal assurances. Most interviewees reported that help-seekers deliberately omit or minimize key details—such as debt levels, family relationships, or the extent of gambling behaviour—limiting counsellors' ability to design effective intervention strategies. Because personalized intervention depends on a comprehensive understanding of each individual's situation, incomplete or inaccurate information can directly undermine the effectiveness and timeliness of counselling processes. *"I remember one case where the gambler's partner reported much higher debts than the gambler admitted, so the repayment plan I set up for him was completely useless"* (P13).

5.1.2 Inadequacy of Digital Tools in Ensuring Therapeutic Usability. Counsellors emphasized that the limited therapeutic usability of current helpline technologies significantly constrains the effectiveness of interventions. While helplines offer accessible communication channels, interviewees consistently reported that they lack teletherapy tools to support psychological work for gambling harm. Two critical gaps were consistently identified: the absence of general tools for effective therapeutic interaction and the lack of domain-specific resources for addressing gambling-related cognitive distortions.

Most counsellors reported that current helpline systems do not create the conditions necessary for professional psychological treatment. Many help-seekers contact the service during moments of acute emotional distress, when guided and interactive exercises are essential for emotional regulation and reflection. However, therapeutic approaches commonly used in prior intervention designs, such as structured prompts, real-time visualizations, or shared interactive materials, are difficult to implement within phone-based or similar communication settings. *“We try to guide them in using mindfulness to regulate their emotions, but it’s very difficult over the phone... they often don’t have the right environment to do it”* (P07). Similarly, in interactions conducted through instant messaging platforms, counsellors reported challenges in evaluating help-seekers’ emotional responses. The absence of nonverbal cues, such as facial expressions or body language, limits counsellors’ ability to interpret distress or risk in real time, particularly when help-seekers are asked to complete forms or structured inputs online. *“When they fill out a form online, you can’t tell how they’re doing—it’s just waiting... In person, I can see their reactions, like hesitation, nervousness, or avoidance”* (P13).

Beyond these general teletherapy constraints, counsellors highlighted a domain-specific gap in teletherapy: the limited capacity of current helpline systems to intervene in the cognitive mechanisms underlying gambling-related harm. Many help-seekers hold persistent misconceptions about probabilities, expected value, and the mathematical certainty of long-term loss [38]. Although some institutions have experimented with educational tools—such as Excel-based probability demonstrations—these methods remain technically cumbersome, cognitively demanding, and difficult to scale. *“We mainly rely on Excel, but there are still challenges in scaling this concept or making it widely understandable”* (P11).

5.1.3 Ability to Leverage Nonverbal Cues for Secure and Contextual Assessment. Despite the limitations of anonymous helplines, most counsellors emphasized that real-time helpline communication still affords access to valuable nonverbal cues beyond help-seekers’ verbal expressions. These cues play a crucial role in assessing safety, emotional state, and situational context, particularly when individuals are in crisis.

Counsellors explained that, because helplines can be accessed anytime and from any location, help-seekers often contact the service in a raw and unfiltered state, revealing contextual and behavioural information rarely observed in traditional, in-person interventions [17]. Such ambient and situational cues help counsellors cross-validate the help-seeker’s emotional condition, risk level, and surroundings, leading to more accurate assessments and timely interventions. *“When talking to a help-seeker, I pay close attention to background sounds. If I hear strong wind or ocean waves, it might mean the person is on a tall building or by the sea (not a safe place), which makes me more alert to their condition”* (P01).

These multi-modal signals are particularly important when help-seekers—often influenced by stigma and privacy concerns—downplay or conceal the severity of their problems. *“They are very concerned about being judged, and they are cautious about sharing personal feelings”* (P04). A few interviewees noted that although help-seekers may verbally deny distress, subtle cues such as pauses, tone changes, or background noise can reveal underlying emotional turmoil. For instance, one counsellor identified a suicide risk from environmental sounds that the help-seeker never explicitly mentioned: *“The help-seeker kept saying ‘I’m fine, I’m fine,’ but I heard a security guard in the background asking what he was doing on the rooftop”* (P05).

5.2 Perception of Efficiency of Helpline

Efficiency refers to the resources—such as time and effort—required to achieve a task [40]. In the context of gambling helplines, counsellors described efficiency in terms of how the digital infrastructure mediates their speed of response, coordination, and communication.¹

Our findings reveal both positive and negative perceptions of system efficiency. On the positive side, counsellors emphasized that real-time communication enables prompt crisis intervention, and digital sharing of supporting materials streamlines coordination and reduces repetitive work. On the negative side, they reported that language and cultural barriers often increase communication effort, limiting the overall efficiency of the helpline.

5.2.1 Ensure Safe and Timely Interventions Through Real-Time Communication. Our interviewees perceived the helpline's capacity for real-time communication as a major factor enhancing the efficiency of intervention work, particularly when supporting help-seekers experiencing severe gambling-related harm.

Counsellors described synchronous channels, such as phone calls, as essential interaction modalities for crisis care, as they afford immediacy, continuous feedback, and rapid bidirectional coordination when help-seekers are in acute distress. In contrast to asynchronous platforms, real-time communication supports rapid risk assessment and timely intervention in safety-critical situations. *"Once a help-seeker expressed harmful thoughts through social media, we immediately called them back to quickly establish contact... This also allowed us to check their background sounds to confirm whether they were in a safe environment"* (P13).

Counsellors further noted that timing itself constitutes a critical form of technology-mediated care in such crisis-driven contexts. Being present at the precise moment when individuals experience heightened vulnerability—rather than simply reacting quickly—was viewed as essential to effective intervention. They explained that gambling harm often involves overlapping crises, including financial debt, relationship breakdown, and unemployment (Section 2), which can lead to intense emotional distress and elevated suicide risk. *"Some people have a strong sense of hopelessness, feeling that their life is already ruined because of gambling"* (P05).

5.2.2 Exchange of Supporting Materials for Addressing Complex Issues. Counsellors emphasized that instant messaging platforms afford opportunities to exchange supporting materials, which significantly enhances the efficiency of gambling harm interventions. The helpline's technological infrastructure enables help-seekers to share relevant documents—such as income proofs, loan contracts, or financial statements—anytime and from any location, allowing counsellors to make faster and more accurate assessments of each case. This immediacy was seen as particularly valuable because many help-seekers struggle to articulate their financial difficulties due to limited financial literacy or emotional distress [94]. *"Sometimes they can't explain clearly what kind of debt they have, but if they send us a document or screenshot, we can quickly understand and help them"* (P03).

Notably, the lack of mechanisms for exchanging materials in telephone-based communication can create barriers to effective counselling. This limitation is especially critical in high-risk cases, where help-seekers face complex financial and legal entanglements, such as illegal lending practices or threats of violent debt collection, which are difficult to articulate through verbal description alone. *"They also come to us seeking legal support, because they are facing violent debt collection... sometimes it is very hard for me to explain things clearly using only words"* (P03).

5.2.3 Increased Communication Costs Due to Language and Cultural Barriers. Although counsellors generally viewed the helpline as efficient, they also described communication inefficiencies amplified by the system's technological mediation. These challenges were rooted in both language barriers, which complicate direct understanding, and cultural gaps, which shape how gambling harm is expressed and interpreted across regions.

¹Evaluating long-term outcomes or clinical effectiveness of interventions is beyond the scope of this work.

Counsellors noted that the accessibility of communication technologies brings help-seekers from diverse linguistic backgrounds, resulting in variations in dialect, accent, and terminology. Such diversity often interacted with the technical limitations of the helpline system, such as poor audio quality, unstable connections, and the lack of built-in translation or transcription support. As a result, counsellors sometimes struggled to interpret speech accurately or had to repeatedly ask for clarification, which they worried could be perceived as impatience or lack of empathy. *“Sometimes the help-seeker has a strong accent, and if I can’t understand them, they might think I’m not taking them seriously”* (P04).

Relying primarily on communication technologies within gambling helpline systems can also increase counsellors’ emotional workload. For example, one interviewee described a case in which she was assisting a help-seeker from Taiwan. When encountering unfamiliar regional expressions, she had to open an additional browser to search for their meanings during the conversation, while simultaneously maintaining the flow of dialogue and providing timely responses—an effort that required a high level of concentration. *“He used a term I didn’t understand, so I had to look it up while keeping the conversation going and taking notes at the same time”* (P06).

Institutional and regulatory differences further compounded these issues, particularly differences in gambling practices and financial environments across regions. Even among geographically close regions, variations in gambling practices and financial environments produced different risk patterns and emotional narratives that were not always apparent through digital communication. For example, help-seekers from mainland China often faced excessive debt due to low-threshold online lending, while those from Hong Kong more frequently reported fear of violent debt collection. *“Online lending is more widespread in mainland China, so it’s easier for people to borrow too much money. In Hong Kong, more help-seekers worry about violent debt collection”* (P03).

5.3 Perception of Satisfaction of Helpline

Satisfaction refers to users’ comfort with and positive attitudes toward using a system [40]. For gambling helpline counsellors, satisfaction primarily reflects the subjective comfort and emotional experience of communicating with help-seekers through digital channels. Our findings highlight the dual effects of ubiquitous technologies in gambling helplines: Mobile telephony and instant messaging support more comfortable and less stigmatising interactions for help-seekers, while their real-time and emotionally intensive use can impose significant emotional strain on counsellors over time.

5.3.1 Supporting Trust and Comfort with Privacy-Sensitive Individuals. Communication modes play a central role in fostering trust and comfort with help-seekers, particularly those who are highly sensitive to stigma or social exposure. Despite differing preferences, counsellors generally agreed that the existing use of ubiquitous technologies in helplines provides at least one communication mode that enables comfortable and supportive interaction.

Most counsellors favoured voice calls for their ability to create a stronger sense of social presence and emotional immediacy. Single-modality interaction helped focus help-seekers’ attention and enabled counsellors to strategically leverage vocal cues such as tone, pacing, and rhythm to convey empathy [100]. These paralinguistic cues were seen as essential for establishing credibility and trust with help-seekers who might otherwise hesitate to disclose sensitive experiences. *“Some people question whether I’m a robot... Through phone calls, I can prove I’m real... I make my voice softer and gentler during conversations, which helps soothe certain help-seekers”* (P05).

Others emphasized the complementary value of text-based communication for help-seekers who were passive during communication. Counsellors described how text-based modalities create a less intrusive and more ambient interactional environment [71], allowing help-seekers to engage at their own pace and with greater emotional control. Several counsellors further noted that simple graphic elements—such as emojis, punctuation, or brief

acknowledgements—could help re-establish emotional connection when interaction stalled with such low-motivated help-seeking. “*When the help-seeker stops replying, I like to use emojis to break the awkward silence*” (P02).

5.3.2 Exacerbation of Mental Fatigue in Real-Time Communication. Although real-time communication afforded by current ubiquitous technologies is valued for its immediacy, several counsellors expressed concern that it imposes significant cognitive and emotional demands, which may compromise both their psychological well-being and the quality of intervention. They explained that synchronous modes such as phone calls require continuous, high-effort multitasking—listening, interpreting, regulating emotions, and responding in real time—without adequate space to pause, reflect, or seek additional information. “*All of my energy is spent calming the person down, so I barely have the capacity to search for things I don’t understand*” (P08). Compounding these demands, the systems provided no dedicated support for in-situ documentation or information capture, forcing counsellors to rely on manual note-taking during or after the interaction. As a result, this high-pressure environment left little opportunity to take notes, process complex cases, or verify information, requiring counsellors to rely primarily on memory and increasing cognitive strain and the risk of oversight. “*I can only rely on memory. If I try to write things down, I lose focus and fall behind the help-seeker’s pace*” (P02).

Key Takeaway

We summarize how counsellors experience constrained, technology-mediated helpline systems and how these systems simultaneously support and complicate the delivery of psychological interventions while protecting vulnerable individuals.

- **Affordances for counselling work.** In terms of *effectiveness*, low-exposure technologies reduce identity risk and encourage help-seeking, while mobile phone-based interaction still provides counsellors with useful contextual cues—such as vocal tone and response timing—to assess help-seekers’ crisis states (Section 5.1.3). In terms of *efficiency*, real-time communication supports timely crisis intervention, and document sharing through instant messaging reduces repeated explanations across interactions (Sections 5.2.1 and 5.2.2). In terms of *satisfaction*, low-exposure communication supports trust and a sense of safety, particularly for help-seekers who are passive and sensitive to social exposure (Section 5.3.1).
- **Constraints and unintended burdens on counsellors.** In terms of *effectiveness*, the lack of features tailored to privacy-sensitive intervention work limits information sharing and makes comprehensive assessment more difficult (Sections 5.1.1 and 5.1.2). In terms of *efficiency*, widely accessible technologies increase linguistic and cultural diversity among help-seekers, requiring additional interpretive and communicative effort from counsellors (Section 5.2.3). In terms of *satisfaction*, sustained real-time interaction without adequate record-keeping or documentation support contributes to cognitive and emotional fatigue, revealing the hidden cost of continuous availability in ubiquitous computing in healthcare (Section 5.3.2).

6 CHALLENGES IN SUPPORTING INDIVIDUALS VIA ANONYMOUS GAMBLING HELPLINES

This section explores the broader challenges faced by counsellors in supporting technology-mediated care within existing helpline systems (RQ2). These challenges extend beyond the usability of individual systems, reflecting counsellors’ long-term experiences within the sociotechnical environment of anonymous helplines that constrain mobile telephony and instant messaging technologies. Our analysis highlights three levels of challenges: (1) at the individual level, counsellors face tensions between maintaining personal well-being and delivering effective interventions; (2) at the organisational level, they experience gaps in training and institutional support; and (3) at the technological level, they express ambivalence toward emerging tools that both enable and complicate their work.

6.1 Individual-Level Challenges

At the individual level, counsellors perceived their privacy concerns as one of the most significant challenges in supporting help-seekers. They described a constant tension between protecting their own privacy and maintaining the effectiveness of interventions. On one hand, they faced risks of emotional dependency and boundary-crossing behaviour from help-seekers; on the other hand, overly strict anonymity measures sometimes hindered rapport-building and trust formation during counselling interactions.

Almost all interviewees reported that the emotional support and empathetic listening provided through helplines can sometimes lead help-seekers to develop emotional dependency or even personal attachment toward counsellors [43]. This tendency was particularly evident among individuals affected by gambling harm, who often feel isolated and misunderstood in their daily lives. *“Emotional dependency is very common, especially because many of them feel ignored in their everyday lives”* (P13). In some cases, this dependency escalated into boundary-crossing behaviours, such as unsolicited messages or attempts to contact counsellors outside the helpline. One participant shared a case in which a help-seeker used the counsellor’s name to locate their personal social media account: *“Someone once learned my name and later found my Instagram account through social media searches.”* (P04). Some participants reported adopting deliberate interactional strategies during their work to reduce the risk of being recognised outside the helpline context, such as using a distinct vocal tone that differs from their everyday voice. *“I deliberately lower my voice at work so that it sounds different from how I speak in daily life... after all, sometimes we know too much about others’ private matters”* (P06).

At the same time, counsellors expressed concern that the simple anonymity mechanisms used to protect their identity can inadvertently hinder intervention work. Because many help-seekers are already highly privacy-sensitive and defensive (Section 5.1.1), the lack of a personal touch may make counsellors appear distant or insincere. Some interviewees explained that while using a staff ID number ensures privacy, it often feels impersonal and weakens emotional connection; conversely, pseudonyms risk accidental exposure that could damage credibility and trust. *“In building relationships with clients, sincerity matters. A staff ID feels too cold... But if I use a fake name—say I tell the client I’m Mr. Wang, and then a colleague accidentally calls me Mr. Li in front of them—they might think I’m lying”* (P07).

6.2 Organizational-Level Challenges

Beyond individual concerns, counsellors also reported organisational gaps in training and professional development that undermine both their short-term emotional resilience and long-term growth in accessing external resources and professional skills. At the same time, strong privacy concerns surrounding help-seekers further restrict the internal reuse of case materials for learning and training purposes.

From a short-term perspective, a major organisational challenge lies in the absence of formal structures to support counsellors’ emotional resilience. Counsellors emphasized that relapse is common in gambling harm recovery and often requires repeated interventions over time. While experienced staff generally accept relapse as part of the process, early-career practitioners often interpret these outcomes as personal failures, leading to emotional exhaustion and diminished confidence. *“New colleagues often experience psychological pressure, feeling responsible for relapses and questioning their effectiveness, sometimes leading them to consider leaving the profession”* (P04). Currently, coping strategies are largely informal—most counsellors rely on personal reflection or peer discussions to process difficult cases rather than institutionalised support. *“Some people struggle with feelings of failure and can’t move on... As senior counsellors, we offer support, but it’s ultimately up to the individual”* (P07).

From a longer-term perspective, another challenge concerns the lack of training resources that adequately address cultural differences and the domain-specific characteristics of gambling-related harm. On the one hand, several counsellors noted that existing intervention models are predominantly derived from Western psychological frameworks [12], which assume open emotional expression and direct communication—norms that do not always

align with local cultural practices. They explained that local help-seekers often require more gradual rapport-building before discussing emotions, a skill that is insufficiently addressed in current training materials. *"In Western models, people express emotions more easily, and the intervention model is built on that mode... But here, you first have to guide them to talk about their feelings"* (P09). On the other hand, counsellors pointed to a shortage of gambling-specific professional development programs, shared case databases, and tailored learning materials. Opportunities for shared learning and collective skill development across organisations remain limited. Although gambling helpline organisations often possess extensive archives of recorded case data, these materials are typically sealed and remain largely inaccessible in order to protect help-seekers' privacy. *"These recordings involve patients' private information, so they definitely cannot be shared"* (P11). As a result, many practitioners rely on trial-and-error learning in real-world cases, which they describe as both inefficient and emotionally draining. Several participants also mentioned the financial burden associated with self-funded professional development. *"If you want to work in this field long-term, you have to keep learning. Many people can't save money because they're constantly paying for courses to figure out what method works best for them"* (P05).

6.3 Technology-Level Challenges

At the technological level, counsellors discussed a set of sociotechnical tensions that emerged from their long-term experiences working with constrained, technology-mediated helpline systems. While emerging technologies hold promise for improving service efficiency, they also introduce new privacy risk concerns that directly affect counsellors' trust in these systems and their willingness to adopt them in practice.

Privacy consistently emerged as a central technology-related concern for both help-seekers and counsellors. From the perspective of help-seekers, because gambling is a highly stigmatised behaviour, strong privacy protections are considered essential [53]. As a result, helpline organisations tend to be cautious about introducing new data-driven technologies to modify or enhance existing communication models, due to concerns that poorly understood connectivity or data transmission practices could expose help-seekers to privacy breaches. *"I don't really understand the technology, so I don't know what the risks are. If there's a privacy leak, it would be a serious issue"* (P08). Counsellors also expressed personal privacy concerns regarding digital platforms, noting that helpline technologies leave digital traces that can be captured, copied, or redistributed. These concerns led current counsellors to avoid video-based communication altogether, due to perceived risks associated with screen recording and misuse. *"With video, you always worry that someone might record the session and use it maliciously, like editing clips out of context. That's really risky and dangerous"* (P07).

Despite these concerns, nearly all interviewees recognised the potential of assistive technologies to enhance efficiency if implemented responsibly. They anticipated systems that could handle administrative or data-intensive tasks while preserving privacy and human oversight. *"Even simple functions, such as speech-to-text, could help us reduce our workload."* (P10).

Key Takeaway

We summarize broader sustainability challenges faced by counsellors when supporting technology-mediated care practices within constrained helpline systems.

- Existing communication technologies provide limited mechanisms for protecting counsellors' own privacy and managing boundary risks arising from emotionally intensive interactions.
- Organizational strong constraints for help-seekers' privacy data restrict organisations' ability to reuse historical case records for training or knowledge sharing. At the same time, widely available, general-purpose training resources remain poorly aligned with the context-specific demands of gambling-related counselling work.

- Although counsellors express strong interest in additional technological support to improve service delivery and intervention quality, the need to preserve both help-seekers' and counsellors' privacy significantly constrains the integration of new technologies into existing infrastructures.

7 DISCUSSION

Building on our empirical findings, this section first examines the constraints that supporting gambling-harmed individuals places on ubiquitous computing systems, drawing on the findings on counsellors' perceptions of gambling helpline usability presented in Section 5. We show how these constraints challenge counsellors' ability to deliver effective interventions during live interactions. We then build on these challenges, together with the empirical findings on sustaining gambling helpline work presented in Section 6, to propose a set of design implications at both interactional and organisational levels. These implications focus on how existing ubiquitous systems can be better designed to support effective intervention delivery under the structural limitations of gambling helpline contexts.

7.1 The Tension Between Protection and Intervention in Helpline with Ubiquitous Technologies

In this section, we build on the empirical findings on counsellors' perceptions of gambling helpline usability presented in Section 5 to discuss the broader tension between protection and intervention. From counsellors' perspectives, we examine how the needs of highly stigmatised and vulnerable populations constrain the use of ubiquitous computing technologies, and how these system constraints subsequently shape counsellors' ability to deliver effective interventions. Table 2 summarises this analytical connection and links it to supporting evidence from the findings sections.

Specifically, drawing on the help-seeking characteristics of stigmatised vulnerable populations [115], we identify three key constraints: First, crisis-driven help-seeking requires systems to support continuous, 24/7 real-time service. Second, privacy-sensitive help-seeking requires strong anonymity and low-exposure interaction. Third, low motivation for sustained engagement requires systems to support effective intervention within single-session encounters.

7.1.1 Crisis-Driven Access: Continuous Real-Time Availability. A constraint of crisis-driven help-seeking is that help-seekers have limited cognitive and emotional capacity to adapt to complex access systems. Crisis-driven help-seeking is characterised by experiencing anxiety, agitation, suicidal ideation, or profound hopelessness [115], resulting in interactions marked by emotional intensity and severe time pressure, as noted in Section 5.2.1. This pattern contrasts with general healthcare contexts, where care is typically delivered through planned pathways, scheduled sessions, and gradual engagement over time [101].

To operate under these constraints, gambling helpline systems prioritise simple, real-time communication channels and continuous 24/7 availability [33]. In practice, this is realised through phone calls and instant messaging—everyday communication technologies that require no additional learning or cognitive effort from help-seekers. As discussed in Section 5.2.1, our findings show that their high synchronicity and immediate feedback enable tight real-time interaction loops and support timely intervention in crisis situations. These ubiquitous technologies ensure immediate access and timely response. At the same time, this mode of operation places sustained demands on counsellors, who must manage high volumes of emotionally intense interactions with limited system-level support.

Challenge: Delivering high-responsiveness, multi-dimensional support. Emotional urgency introduces significant interactional and operational challenges for counsellors, as evidenced in Sections 5.1.3, 5.3.1, 5.2.3, and 5.3.2. They must rapidly assess crisis severity while relying on emotionally charged and often unstructured expressions, while also maintaining smooth and supportive interaction to help stabilise help-seekers emotionally.

Table 2. Summary of three distinctive characteristics of the gambling helpline context, the corresponding system priorities required to accommodate them, and the challenges that arise from their tension with counsellors' intervention needs. The table also links each synthesis to supporting evidence from the findings sections.

Characteristic	System Priorities	Evidence from Findings	Intervention Challenges	Evidence from Findings
Crisis-driven	Systems prioritise continuous 24/7 availability and real-time synchronous communication.	Real-time communication enables timely help (Sec. 5.2.1).	Counsellors must conduct time-pressured crisis assessment under emotionally intensive interaction.	Need to reduce cross-cultural communication barriers (Sec. 5.2.3). Need to support emotional comforting (Sec. 5.3.1). Need to manage multiple tasks within a limited time (Sec. 5.3.2).
Privacy-sensitive	Systems prioritise anonymity and low-exposure interaction to reduce identity risk.	Diverse forms of anonymity support help-seeking (Sec. 5.1.1).	Counsellors work within information-limited interactions that increase interpretative burden and constrain system extensibility.	Need to gather multiple cues for assessment (Sec. 5.1.3). Need to access professional materials (Sec. 5.2.2).
Low motivation for sustained engagement	Systems prioritise stable, low-resource communication channels to ensure connection reliability.	Stable communication supports continued help access (Sec. 5.2.1).	Counsellors must deliver effective intervention within single-session and feature-limited interaction environments.	Need to support diverse information exchange (Sec. 5.2.2). Need digital tools to support ongoing interventions (Sec. 5.1.2).

These demands are further intensified when language barriers or cultural differences complicate real-time interpretation. Together, these conditions result in cognitively and emotionally demanding interactions that contribute to counsellor fatigue and reduce the efficiency of intervention delivery.

7.1.2 Privacy-Sensitive Access: Anonymity and Low-Exposure Interaction. A constraint of privacy-sensitive help-seeking is that individuals affected by gambling harm have a strong need to minimise identity exposure. Privacy-sensitive help-seeking is characterised by heightened concerns about stigma, anonymity, and social judgment [116]. As noted in Section 5.1.1, these concerns resulted in help-seeking interactions marked by cautious engagement and limited self-disclosure. As a result, supporting privacy-sensitive populations requires interaction models that prioritise privacy protection and minimise unnecessary identity exposure. This pattern contrasts with other healthcare contexts, where care delivery often relies on richer data collection and visually mediated interaction to support remote care and therapeutic engagement [101].

To operate under these constraints, gambling helpline systems prioritise anonymity and low-exposure interaction models. In practice, this is realised through text-based chat and voice-only calls—everyday communication modalities that exclude intrusive visual data. As discussed in Section 5.1.1, these modalities allow help-seekers to maintain greater control over their self-presentation. These anonymity technologies lower the psychological

threshold for engagement by reducing the perceived risk of identity exposure. At the same time, this mode of operation creates an information-poor interaction environment that places interpretative burdens on counsellors.

Challenge: Balancing privacy protection with effective and extensible intervention. While anonymity and confidentiality are essential for engagement, they introduce challenges for counsellors' intervention work and system evolution. Our findings in Section 5.2.2 reveal that, to document cases, coordinate follow-up, and support continuity of care, counsellors often need to identify help-seekers and collect minimal personal information. At the same time, as shown in Sections 5.1.3 and 5.3.2, low-exposure interaction limits explicit contextual cues, requiring counsellors to infer crisis states from subtle signals such as pauses, speech patterns, or background sounds during time-pressured interactions, thereby increasing cognitive workload and fatigue. In addition, as discussed in Section 6.3, confidentiality-oriented data practices often require sensitive records to be stored in isolated or offline systems that prioritise security over accessibility and interoperability. While this reduces privacy risk, it constrains system extensibility and makes it difficult to integrate supportive tools such as real-time translation, contextual information retrieval, or automated note-taking, despite their demonstrated value in other remote communication settings [84, 106, 123].

7.1.3 Low Motivation for Sustained Engagement: Effective Intervention within Single-Session Care. A constraint of low-motivation help-seeking is that interventions must be delivered within a single-session interaction window, with limited opportunity for sustained engagement. Low-motivation help-seeking is characterised by reduced self-efficacy and diminished willingness to remain in treatment [113], while cognitive distortions—such as viewing gambling as a solution to financial or relational problems—further undermine motivation for follow-up care. As outlined in Section 5.1.2, in our findings this often resulted in limited engagement beyond an initial interaction. Therefore, help-seeker–counsellor interactions in gambling helplines are marked by the need to treat each session as a critical moment for intervention. This pattern contrasts with institutional care settings, where clients are more likely to engage proactively and repeatedly over time through sustained treatment pathways [74, 112].

To operate under these constraints, gambling helpline systems prioritise robust and reliable communication channels. In practice, this is realised through low-bandwidth text- and voice-based communication modalities that are resilient to network latency and packet loss [65]. As highlighted in Section 5.2.1, our findings suggest that by minimising communication resource requirements, these everyday communication technologies help ensure stable connections and reduce the risk of interruptions that could prematurely sever fragile therapeutic alliances. At the same time, this emphasis on channel reliability constrains interaction diversity, limiting the availability of tools that support richer forms of assessment and intervention work.

Challenge: Delivering multimodal interventions in feature-limited interaction environments. The need for cognitive correction introduces a tension between intervention complexity and feature-limited communication channels. Effective intervention goes beyond general advice and requires tailored psychoeducation across multiple problem domains. As discussed in Section 5.2.2, debt management often depends on the accurate exchange and interpretation of financial documents. Section 5.1.2 further shows that behavioural recovery relies on evidence-based strategies such as emotional regulation and relapse prevention, while addressing cognitive distortions requires concrete and illustrative tools to explain abstract concepts such as randomness or house edge. Lacking supporting digital workspaces, current systems force counsellors to manage complex contexts solely through verbal descriptions. This reliance on constrained modalities creates an information bottleneck that prevents moving from general advice to effective intervention.

7.2 Design Implications

Building on our previous discussion of how help-seeking constraints shape the design of ubiquitous helpline systems, we highlight the practical significance of existing technology-mediated models based on phone calls

Table 3. Overview of the design sections, specific design implications, and the intervention challenges they address in gambling helplines. The table summarises how the proposed design implications respond to key challenges identified in the discussion and indicates the corresponding sections in which each implication is further developed.

Design Section	Specific Design Implications	Challenge Addressed
Help-seeker frontend	Making anonymity explicit	Balancing privacy protection with effective and extensible intervention (Sec. 7.1.2).
	Progressive disclosure for privacy control	Balancing privacy protection with effective and extensible intervention (Sec. 7.1.2).
Counsellor frontend	Feedback-sensitive tools	Delivering high-responsiveness, multi-dimensional support (Sec. 7.1.1).
	Intervention-aligned digital resources	Delivering multimodal intervention in feature-limited environments (Sec. 7.1.3).
	Provider privacy personas	Balancing counsellors' privacy protection with effective intervention (Sec. 6.1).
Backend and data governance layer	Tiered identity governance	Balancing privacy protection with effective and extensible intervention (Sec. 7.1.2).
	Pseudonymous case management	Balancing privacy protection with effective and extensible intervention (Sec. 7.1.2).
	Localized analytics	Managing privacy risks introduced by new technology applications (Sec. 6.3).
Cross-cutting counsellor support	Continuous training support	Addressing training and professional development gaps (Sec. 6.2).
	Post-session reflection	Addressing emotional burden in relapse-prone work (Sec. 6.2).

and instant messaging in supporting individuals affected by gambling harm. These everyday communication technologies form the core access infrastructure for gambling-harmed individuals. In this section, we propose design implications that build on this existing mediation model. Rather than advocating for entirely new interaction paradigms, we focus on how current ubiquitous helpline systems can be better designed. These design implications are informed by the intervention challenges synthesised in Section 7.1, which are derived from the empirical findings in Section 5. We also draw on the empirical findings on sustaining gambling helpline work presented in Section 6. Table 3 summarises the proposed design sections, the specific design implications under each section, and the challenges they address, while linking them to the corresponding sections in which they are discussed in detail.

We organise these design implications across four layers: the help-seeker frontend, the counsellor frontend, the backend and data governance layer, and cross-cutting counsellor support. This layered framing draws on sociotechnical systems theory [121] and the three-tier architecture [32].

7.2.1 Help-Seeker Frontend: Augmenting Trust and Control. Given that our findings in Section 7.1 show that existing ubiquitous technologies effectively accommodate the cognitive and emotional constraints of help-seekers, we do not advocate altering the fundamental access paradigm. Instead, we propose lightweight enhancements that make anonymity an explicit and progressive disclosure mechanism. This approach aims to mitigate perceived

risks of identification, thereby reducing the immediate threat of stigma-related social exclusion or discrimination during help-seeking.

Making System-Level Anonymity Explicit. As summarized in Section 7.1.2, to address help-seekers' fear of identification while supporting case continuity, helpline systems should treat anonymity as an explicit and visible system feature rather than an implicit assumption. At the beginning of an interaction, systems should clearly communicate anonymity guarantees through standardized disclosures—for example, during recorded call introductions or when initiating contact in instant messaging systems (e.g., “Your number is encrypted and not visible to the counsellor”). Making anonymity explicit helps translate backend privacy protections into perceived safety for help-seekers. These guarantees must be supported at the architectural level. Routing interactions through hashed aliases instead of raw identifiers (e.g., phone numbers) creates a structural separation between identity and traceability [88]. This approach allows counsellors to link prior sessions and maintain continuity without accessing personally identifiable information, reinforcing trust at the interactional level.

Progressive Disclosure for Granular Privacy Control. Section 7.1.2 highlights the tension between help-seekers' reluctance to share sensitive information and counsellors' need for sufficient detail to provide effective support. Progressive disclosure mechanisms can help balance these competing needs. Prior work shows that such mechanisms can increase users' perceived control over personal information in other domains [119]. Helpline systems can support more flexible information sharing by offering fine-grained visibility controls. For example, help-seekers could share time-limited, view-only links through existing channels such as instant messaging or SMS. Each link could include a clear consent notice specifying retention duration, visibility scope, and archival status.

7.2.2 Counsellor Frontend: Managing Real-Time and Effective Support Under Constraint. The counsellor interface should support real-time interaction management, effective intervention delivery, and counsellors' own privacy protection. To address these needs, we propose integrating three types of interface features: feedback-sensitive tools for real-time communication, digital resources aligned with intervention goals, and system-managed persona controls.

Feedback-Sensitive Tools for Timely Support. Feedback-sensitive tools can help reduce the mental fatigue associated with real-time remote support, as discussed in Section 7.1.1. As many systems for ubiquitous computing in healthcare already operate under explicit consent for session recording, such tools can be designed to remain lightweight and supportive rather than intrusive. The system can surface subtle indicators derived from existing interaction signals—such as response latency, speech–silence patterns, or background noise—directly within the interface. These cues support counsellors' interpretation of help-seekers' emotional states while reducing the cognitive load of continuous verbal monitoring. In addition, the interface can incorporate lightweight feedback collection mechanisms, such as dynamic prompts that capture hesitation, message edits, or delayed responses, to support ongoing assessment during remote sessions and thereby address the feature-limited interaction environment discussed in Section 7.1.3.

Digital Resources Aligned with Intervention Needs. Counsellor interfaces should support the delivery of intervention resources through existing phone- and messaging-based channels. For tasks requiring accurate information exchange, such as debt management, counsellors can share secure document links via SMS or instant messaging without interrupting live phone support. During behavioural recovery and emotional regulation, lightweight in-session supports—such as calming background music during calls—can help stabilize help-seekers' emotional states. To address cognitive distortions, counsellors can share links to simple web-based visual or interactive tools that illustrate concepts such as randomness or house edge beyond verbal explanation alone.

Customizable Personas for Provider Privacy. System-managed persona features can help balance counsellors' emotional engagement with their need for privacy and personal safety, thereby responding to the privacy concerns highlighted in Section 6.1. Rather than relying on individual self-regulation, such features should be

embedded within institution-managed telecommunication infrastructure. For example, helpline systems could associate a small set of predefined voice presentation presets with each counsellor profile and apply them automatically at call initiation. These presets can rely on lightweight, real-time audio processing techniques already common in telecommunication systems, such as normalization and filtering, without generating synthetic speech or altering conversational content [131]. By subtly modulating distinctive vocal characteristics in a stable manner, this approach reduces unintended personal exposure while preserving conversational naturalness. Embedding persona management at the system level shifts the burden away from individual counsellors and provides additional privacy protection without undermining trust in voice-based interactions.

7.2.3 Backend and Data Governance Layer: Designing for Continuity Under Privacy Constraints. The backend and data governance layer underpins both the help-seeker and counsellor frontends by mediating information flows and safeguarding sensitive data. Current ubiquitous computing in healthcare often adopts conservative data-handling approaches that prioritize risk mitigation but limit data utility for continuity of care, coordination, and organisational learning. As summarised in Section 7.1.2, this contributes to the challenge of balancing privacy protection with effective and extensible intervention. To address these challenges, we suggest that backend systems adopt three complementary design strategies: tiered data exposure for help-seeker privacy protection, consistent case management for counsellors, and desensitization in system-wide data processing.

Tiered Identity Governance. To align with the low-exposure needs of help-seekers, the system should enforce a strict separation between infrastructure-level routing and application-level interaction. While raw identifiers (e.g., phone numbers) are necessary for the telephony gateway, they should be masked before reaching the counsellor interface. Instead, the backend should expose only stable hashed aliases to frontline staff. This tiered approach decouples traceability from identity, allowing the system to handle routing mechanics while counsellors interact solely with pseudonyms, accessing raw data only via audited break-glass procedures for emergencies.

Pseudonymous Case Management for Continuity. To support sustained engagement without compromising privacy, the backend must enable longitudinal linking based on these hashed aliases. This allows the system to attach counsellor notes, risk flags, and interaction histories to a stable pseudonym rather than a real identity. Furthermore, the backend can facilitate blind follow-up: counsellors can schedule reminders or outgoing messages that the system routes automatically using the stored raw identifier, ensuring continuity of care without ever exposing the help-seeker's contact details to the counsellor during the process.

Localized Analytics as an Enabler. We recommend a privacy-by-design approach where analytics are performed in isolated, local environments rather than centralized cloud repositories [77]. Sensitive data should remain encrypted at rest, with model inference occurring locally to prevent data leakage. Historical records used for system tuning must undergo rigorous de-identification [95]. Crucially, this localized architecture serves as the safe computational engine for the counsellor frontend, as noted in Section 7.2.2. By leveraging local analytics, the backend can power the instructional and contextual scaffolding tools—such as automated context retrieval or real-time resource suggestions—without exposing sensitive session data to external networks. This design allows the system to reduce counsellor cognitive load during high-stakes multitasking, while still adhering strictly to the containment mandates of stigma-sensitive care, thereby responding to the concerns highlighted in Section 6.3.

7.2.4 Cross-Cutting Counsellor Support: Sustaining Skills and Resilience. While the technical layers above support reliable interaction and intervention delivery, our findings in Section 6.2 highlight that sustaining counsellors' long-term effectiveness requires additional system-level support beyond live counselling tasks. We highlight two cross-cutting design directions: continuous training support and post-session reflection for counsellor well-being.

Continuous Training Support for Skill Development. Helpline systems should incorporate continuous training mechanisms to support counsellors' ongoing skill development. Anonymised case records can be repurposed as the basis for scenario-based training modules, allowing counsellors to rehearse evidence-informed

strategies in simulated settings without exposing sensitive data. Such training can support early-career counsellors in building confidence while also helping experienced counsellors refine techniques and adapt to evolving intervention practices.

Post-Session Reflection for Counsellor Resilience. Post-session reflection tools can further support counsellors' emotional resilience in high-stress work contexts. Locally deployed analytic modules can review past session transcripts to surface patterns such as missed cues, tone mismatches, or pacing issues, and provide focused, actionable feedback. By supporting structured reflection rather than real-time intervention, these tools help counsellors identify blind spots and decompress after demanding sessions, contributing to sustained engagement and well-being over time.

7.3 Limitations

Our study has two principal limitations: a constrained sample size and the regional homogeneity of participants. First, as a qualitative study with a small sample, comprising primarily voluntary, experienced counsellors and relying on self-reported data, this work does not support statistical generalisation to the broader population of helpline counsellors. Participation was voluntary, and although financial compensation was offered, participants declined it, which may have contributed to self-selection bias. As a result, counsellors or organisations that are more motivated to innovate or to critically reflect on their practices may be over-represented. To mitigate this risk, we recruited participants from multiple institutions and conducted extended, in-depth interviews; nevertheless, the themes and patterns identified here should be interpreted as exploratory rather than definitive.

Second, we acknowledge the regional homogeneity of our study, as it focuses exclusively on Macao. This geographical focus may limit the generalizability of our findings to other cultural contexts or regions with different helpline operational models. However, Macao was chosen due to its comprehensive helpline services, which offer a more extensive intervention process compared to regions where helplines primarily serve as referral services. Additionally, as the largest gambling hub in Asia—and one of the largest globally—Macao provides a unique context for studying gambling harm interventions. We believe the insights from participants are highly relevant.

8 Conclusion

This study examined how digital helpline systems support or constrain gambling-related psychological interventions from the perspective of counsellors. By focusing on the balance between privacy protection and intervention effectiveness, we identified core tensions and structural challenges that shape helpline support work. While helplines provide critical access for help-seekers, current systems often lack the tools and safeguards needed to support counsellors' professional and emotional needs. We conclude by proposing design directions that align with the intervention process, contributing to broader discussions in Ubicomp on how computing systems can mediate care, safety, and accountability in critical environments.

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A Interview Protocol

• Demographics & Work Experience:

- Can you briefly describe your professional background and your current role in providing interventions for individuals affected by gambling harm?
- How long have you been working in this area?

• Institutional Context:

- Can you describe the operational model of your organisation? How does your team support individuals affected by gambling harm?
- What does a typical day at work look like for you? Could you walk me through your daily routines and workflows when you interact with help-seekers?

– Help-Seeker Characteristics:

- * Can you describe the typical characteristics of the help-seekers you work with? For example, do you notice trends in their age, gender, or emotional state when they seek support?
- * What are the main issues that help-seekers usually present when they contact your service? Are there common themes or patterns you notice in the problems they are trying to resolve?
- * What role do help-seekers' expectations play in shaping the way you deliver support?

• Information Gathering:

- What kind of information do you feel is critical to know in order to effectively support your intervention work?

- When diagnosing a help-seeker's issue, what specific information do you typically gather? Why is this information critical for diagnosis?
- In counselling or providing support, what types of information are most important for you to understand about the help-seeker's situation?
- Are there any challenges in obtaining this information from help-seekers? If so, what are the main obstacles in gathering it?
- Have you ever faced challenges in obtaining the necessary information? If so, what are the reasons for this?
- In your experience, are there ever situations where obtaining critical information is challenging? What are some of the barriers you've encountered?
- **Overall Perceptions of Usability:**
 - How do you feel about using different channels (e.g., phone, chat, email, in-person) to provide intervention?
 - Do you think any particular channel is more usable for your work? Why?
- **Perceptions of Effectiveness:**
 - * How effective do you find the different channels in helping you achieve your goals when intervening with help-seekers?
 - * Do you feel that certain channels lead to more accurate or complete interventions? Why or why not?
- **Perceptions of Efficiency:**
 - * How efficient are the different channels in terms of the time and effort required to provide intervention?
 - * Are there any channels that save you time or effort compared to others? If so, which ones and why?
- **Perceptions of Satisfaction:**
 - * How satisfied are you with using each of the different channels to provide intervention?
 - * Are there any channels you find easier or more convenient to use than others? Why?
 - * What types of channels tend to lead to more positive interactions with help-seekers, if any? Why?
- **Impact of Privacy Sensitivity on Usability:**
 - How do privacy concerns from help-seekers affect your intervention work? Can you provide any examples?
 - Are there any challenges related to privacy that you face when using certain helpline channels?
 - **Understanding the Need for Privacy:**
 - * Why do you think help-seekers have strong privacy concerns when reaching out for support?
 - * Are there any specific fears or harms that might drive this need for privacy?
 - * What kinds of risks or concerns do you think help-seekers have related to privacy? Why?
 - **Ensuring Privacy:**
 - * How do you ensure the privacy of help-seekers during your interventions? Are there specific measures or procedures in place to protect their information?
 - * How do you communicate with help-seekers about privacy protections? What steps do you take to ensure they understand how their information will be handled?
 - **Impact on Intervention:**
 - * In your experience, do privacy concerns influence your ability to intervene effectively? If so, in what ways?
 - * Are there any negative consequences of these privacy concerns that you feel affect the intervention process?
 - * What are some potential obstacles or challenges that arise from these privacy concerns when providing support to help-seekers?

- **Overcoming Privacy Challenges:**
 - * How do you overcome the challenges posed by privacy concerns in your work? Are there strategies you use to balance privacy with effective intervention?
 - * Are there any technologies or approaches you think could help address privacy concerns while improving your interventions?
- **Challenges with Current Helplines:**
 - What are some of the challenges you face when using helplines to provide psychological interventions for help-seekers?
 - Are there any limitations in the current technology that hinder your work or your ability to provide effective support?
- **Suggestions for Improvement:**
 - In your opinion, how can current technological models for helplines be improved to better support both counsellors and help-seekers?
 - Are there any specific features or tools that you think would enhance your work?
- **Emerging Technologies:**
 - How do you feel about the potential use of emerging technologies (e.g., AI, chatbots, virtual reality) in providing psychological interventions for gambling harm?
 - Have you had any experience with these technologies in your work? If so, what was your experience like?
 - What do you think the role of these technologies could be in the future of helplines for psychological intervention?
- **Follow-Up on Emerging Technologies:**
 - Do you think that any specific emerging technology could improve privacy protection or enhance usability in your work? Why or why not?
- Ask if the participant has any additional thoughts or comments on the topics discussed.
- Thank the participant for their time and insights.
- Offer to share the results of the research, if applicable.

B Interview Codebook

This appendix presents the codebook developed through our thematic analysis. The codebook summarizes the key themes and sub-themes, their definitions, representative quotes, and frequency of occurrence across interviews. For clarity, the codebook is divided into separate tables according to the main thematic domains of the helpline system: Table 4 (Theme A: Demographics & Work Experience), Table 5 (Theme B: Institutional Context), Table 6 (Theme C: Help-Seeker Characteristics), Table 7 (Theme D: Information Gathering), Table 8 (Theme E: Experiences with Communication Channels), and Table 9 (Theme G: Challenges with Current Helplines). Together, these tables provide a structured overview of the qualitative evidence that underpins the design implications discussed in the main text.

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Table 4. Codebook – A. Demographics & Work Experience

Subthemes	Definitions	Examples from Transcripts	N
Professional background	Participant's education, training, and professional background relevant to gambling harm interventions.	My undergraduate degree is in sociology	13
Current role & responsibilities	Description of participant's current position and responsibilities in supporting individuals with gambling harm.	I mainly provide first-line assessments and crisis intervention.	13
Years of experience	Length of time and trajectory in the field.	I've been working in this area for about seven years.	13

Table 5. Codebook – B. Institutional Context

Subthemes	Definitions	Examples	N
Organizational model	How the organisation operates and provides services to help-seekers.	We have a central helpline and then refer people to face-to-face services.	13
Team structure & collaboration	Roles within the team and collaboration with internal/external partners.	We work in shifts, and we have weekly case review meetings.	13
Daily workflow	A typical day, routine practices, and service flow.	My daily work includes answering helpline calls, following up on helpline cases, and carrying out some offline promotional activities for the gambling helpline.	13

Table 6. Codebook – C. Help-Seeker Characteristics

Subthemes	Definitions	Examples	N
Demographics of help-seekers	Typical age, gender, occupation, or other demographic trends.	Most callers are men in their late 20s to 40s.	11
Emotional & motivational states	Emotional conditions or motivations of help-seekers at the time of contact.	They often feel ashamed and anxious about their situation.	11
Common presenting issues	Recurring problems (e.g., debt, relationship issues, relapse).	The most common issue is financial debt due to gambling.	7
Expectations & goals	How help-seekers' expectations shape service delivery.	Some of them come to us for help because a family member is struggling with a gambling addiction.	10
Privacy & security concerns	Privacy fears expressed by help-seekers when contacting services.	They worry about being identified.	10

Table 7. Codebook – D. Information Gathering

Subthemes	Definitions	Examples	N
Diagnostic information	Specific assessment/diagnostic data	We usually begin by assessing the severity of the gambling addiction.	8
Contextual information	Situational data such as family, social support, financial context.	Family support plays a big role in whether they can recover.	9
Environmental safety information	Assessing whether the help-seeker's environment is safe.	Sometimes we need to check if their home environment is safe before continuing the intervention.	9
Barriers to information gathering	Difficulties in obtaining necessary information.	Many are reluctant to disclose debts because of privacy concerns.	10

Table 8. Codebook – E. Experiences with Communication Channels

Subthemes	Definitions	Examples from Transcripts	N
Effectiveness – Confidentiality	Perceptions of how confidentiality concerns and incomplete disclosure affect effectiveness in supporting accurate diagnosis and delivering a comprehensive intervention.	Sometimes they'll repeatedly ask if it's anonymous, if their information will be kept confidential	13
Effectiveness – Digital	Perceptions of how current digital tools affect effectiveness by failing to adequately support professional therapeutic techniques, thereby limiting the accuracy and completeness of interventions.	We mainly rely on Excel, but there are still challenges in scaling this concept or making it widely understandable...Usually it is easier to understand if they have a bachelor's degree or above	9
Effectiveness – Multi-dimension	Perceptions of how helplines affect effectiveness by enabling multi-dimensional assessment through access to diverse information sources (e.g., emotional cues, contextual details) that improve accuracy and completeness.	When talking to a help-seeker, I pay close attention to background sounds. If I hear strong wind or ocean waves, it might mean the person is on a tall building or by the sea (not a safe place), which makes me more alert to their condition	7
Efficiency – Real-time communication	Perceptions of how real-time helpline channels affect efficiency, particularly in crisis situations.	Once a help-seeker expressed harmful thoughts through social media, we immediately called them back to quickly establish contact	8
Efficiency – Supporting material exchange	Perceptions of how the ability to exchange supporting materials through helpline channels affects efficiency in addressing complex gambling-related issues.	Sometimes they can't explain clearly what kind of debt they have, but if they send us a document or screenshot, we can quickly understand and help them	5
Efficiency – Language & cultural barriers	Perceptions of how language and cultural barriers among diverse help-seekers affect efficiency by increasing communication costs.	Sometimes the help-seeker has a strong accent, and if I can't understand them, they might think I'm not taking them seriously	4
Satisfaction – Comfort in communication	Perceptions of how different communication modes affect satisfaction by facilitating comfortable and supportive conversations with help-seekers.	When the help-seeker stops replying, I like to use emojis to break the awkward silence	7
Satisfaction – Mental demands of real-time channels	Perceptions of how real-time communication affects satisfaction by creating higher cognitive and emotional demands, sometimes making interactions more draining.	I can only rely on memory. If I try to write things down, I lose focus and fall behind the help-seeker's pace	6

Table 9. Codebook – G. Challenges with Current Helplines

Subthemes	Definitions	Examples from Transcripts	N
Emotional dependency	Risk that counsellor support creates dependency or boundary-crossing behaviours, threatening staff privacy and safety.	Someone once learned my name and later found my Instagram account through social media search	12
Anonymity trade-offs	Tension between protecting counsellor identity and building trust, as anonymity may hinder rapport while pseudonyms risk exposure.	In building relationships with clients, sincerity matters. A staff ID feels too cold... But if I use a fake name—say I tell the client I’m Mr. Wang, and then a colleague accidentally calls me Mr. Li in front of them—they might think I’m lying	2
Emotional strain from relapse	Frequent relapse contributes to counsellor stress and diminishes confidence, especially among early-career staff.	New colleagues often experience psychological pressure, feeling responsible for relapses and questioning their effectiveness, sometimes leading them to consider leaving the profession.	13
Cultural gaps in training	Existing training models, often based on Western norms, fail to align with local cultural practices, limiting skill development.	In Western models, people express emotions more easily... But here, you first have to guide them to talk about their feelings	8
Insufficient institutional support	Lack of gambling-specific training resources and institutional support forces counsellors to rely on trial-and-error learning.	If you want to work in this field long-term, you have to keep learning... Many people can’t save money because they’re constantly paying for courses	7
Privacy rules creating strain	Policies designed to protect help-seeker privacy (e.g., no call recording) may hinder counsellor safety and accountability.	Some people call just to launch personal attacks... and sometimes even file a complaint against you—you have no proof	4
Digital privacy risks	Worry that digital interventions (recording, video, data storage) may compromise anonymity and safety.	With video, you always worry that someone might record the session and use it maliciously, like editing clips out of context. That’s really risky and dangerous.	3
Automation accountability	counsellors fear unclear responsibility when automated assessments conflict with professional judgment in high-stakes cases.	I know there can be false positives or false negatives—so whose judgment should take priority? If something goes wrong, who is responsible?	3
Potential of digital tools	Despite concerns, counsellors see promise in digital tools for reducing workload and assisting with assessment, transcription, and support.	I’d like automated referral tools that save time.	11