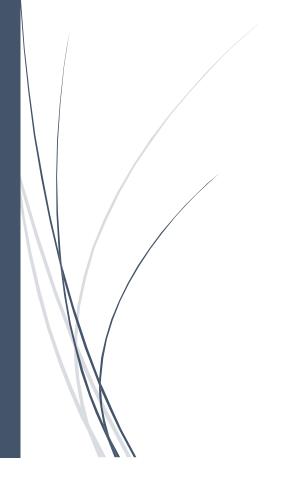# Online Interventions for Substance Use

Introduction

Substance use interventions delivered via internet and mobile technology show increasing efficacy as an engagement strategy for reducing harmful substance abuse. Their extensive reach, accessibility, low cost, and familiarity to younger generations make such digital interventions a promising method of overcoming traditional obstacles to treatment and connecting users to effective harm-reduction techniques. Current research exploring the application of online interventions demonstrates their growing potential to catalyze increased rates of use, depth of interaction, and overall positive outcomes.

Assessing five leading engagement promoting strategies for online substance use interventions, Milward (2018) found evidence that tailoring material, using reminders, and multimedia delivery of content improved usage rates and effectiveness, while the use of social supports and incentives did not.

Analysis by Copeland (2017) similarly showed that brief, online screening and feedback reduced short-term cannabis use, supporting growing evidence of improved outcomes through brief online motivational interventions.

Evaluating recent studies on the use of mobile technology to decrease substance abuse, Kazemi (2017) determined that mobile health interventions can be functional and effective, and merit further practice and development.

Colbert (2020) likewise examined current studies on the use of smartphone applications to curtail harmful alcohol use, concluding that they show promise despite inconclusive evidence of success.

Research by Hita (2018) found that prior parental mediation of alcohol messaging enhanced young people's critical thinking skills about alcohol marketing on social media, catalyzing healthier decisions and indicating the potential of instruction on media literacy in alcohol education efforts.

Summary

Evidence indicates that online substance-use interventions (SUIs) are effective in reducing substance abuse, however low user engagement rates decrease their overall efficacy. To pinpoint optimal methods for strengthening user engagement with online SUIs, researchers examined a range of studies to identify the 5 most prevalent engagement promoting strategies (EPSs) used to increase the impact of online SUIs and determine whether these EPSs enhanced SUI use. (p. 1-13)

1. Tailoring was the most common EPS identified, with 47% of online SUI studies harnessing various tailoring techniques such as targeting level of readiness, self-efficacy and barriers, abstinence status, and motivations to quit. Analyses revealed that greater tailoring through personalized interaction and feedback increased the frequency and depth of using online SUI tools (p. 14, 15).
2. Reminders were the second most prevalent EPS, with 40% of online SUI studies using email follow-ups with program participants. Results indicated that email reminders significantly increased the rates and duration of online SUI engagement (p. 15).
3. Social Support was additionally applied in 40% of online SUI studies, including individual peers, support groups, and/or therapist guidance. However, evidence of increased engagement was inconclusive, with outcomes showing mixed rates and length of use (p. 16).
4. Delivery Strategies as an EPS refers to strategies which manipulate the type of delivery method of the intervention, for example, by video versus text. 33% of online SUI studies employed delivery strategies, with findings suggesting that multimedia delivery of information, and providing information all at once rather than in stages, may be an important method of promoting engagement (p. 15-16).
5. Incentives utilized as an EPS yielded conflicting results, with analyses reporting no significant effects of incentivizing intervention participation, and no differences in engagement between various incentive methods in online SUI studies (p. 16-17).

Overall research outcomes on the effectiveness of the 5 most common EPSs found that "the strongest evidence points to the use of tailoring, email reminders, and multimedia and single-exposure delivery strategies to improve engagement." The use of social support techniques showed inconclusive results, with differential effects on engagement depending on which engagement measure was used. Incentives did not demonstrate effectiveness nor positive engagement results. The evidence further suggests that "using a multi-component EPS

approach is more effective than a single EPS," pointing toward an additive effect of using multiple strategies (p. 17-19).

CITATION

Milward, J., Drummond, C., Fincham-Campbell, S., & Deluca, P. (2018). What makes online substance-use interventions engaging? A systematic review and narrative synthesis. Digital Health, 4, 2055207617743354

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Article 2: Comparison of Brief Versus Extended Personalized Feedback in an Online Intervention for Cannabis Users: Short-Term Findings of a Randomized Trial

Summary

Building on increasing evidence that internet-based interventions curtail substance use, the present study tested the short-term effectiveness of brief and extended personalized feedback in reducing cannabis use and dependence severity through Grassessment, an online intervention program which provides tailored individual feedback regarding motives, use, and harms (p. 43- 44).

194 program participants—aged 18 to 65, with a median age of 26—split between brief and extended feedback groups completed an online follow-up assessment after one month. Participants in the brief feedback group "significantly reduced their frequency of cannabis use by a median of 6 days in the month prior to follow-up, and those in the extended feedback group significantly reduced their cannabis use by a median of 10 days." Previous-month quantity of cannabis use also significantly decreased in both groups, with brief feedback group participants reducing their use by a median of 17 standard cannabis units (SCUs)—one SCU equaling one quarter of a gram—and the extended feedback group decreasing their use by a median of 28 SCUs (p. 44-45).

Overall study results determined that participants in both groups reduced their cannabis use at one-month follow-up. However, only the brief feedback group demonstrated a significant drop in dependence severity from baseline to follow-up. Analysis additionally "did not find short-term changes in cannabis use frequency, quantity, and dependence severity to be associated with the length of feedback received," and there was no difference in participant satisfaction found between feedback groups, with both groups reporting being somewhat satisfied with the program (p. 45-46).

Study outcomes suggest that the brief online intervention Grassessment can help lower cannabis use and related problems in the short-term, and "supports the growing evidence that brief online motivational interventions for cannabis use problems are a promising support platform." Findings further showed no significant differences in cannabis use outcomes

between brief and extended feedback groups, indicating that in the case of Grassessment, extended feedback did not lead to superior outcomes over brief feedback, and minimal feedback may be sufficient to facilitate short-term change in cannabis use behaviors (p. 46-47).

CITATION

Copeland, J., Rooke, S., Rodriquez, D., Norberg, M. M., & Gibson, L. (2017). Comparison of brief versus extended personalized feedback in an online intervention for cannabis users: short-term findings of a randomized trial. Journal of Substance Abuse Treatment, 76, 43-48.

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Article 3: A Systematic Review of the mHealth Interventions to Prevent Alcohol and Substance Abuse

Summary

Evaluating mounting evidence that mobile health (mHealth) approaches—delivering medical care and behavioral support through wireless internet, text messages, and smartphone applications—show promise as a means of reducing substance use, researchers conducted a systematic review of recent studies on mHealth interventions for substance abuse to assess their efficacy, functionality, and implications (p. 413-415).

Analyses demonstrated mixed yet predominantly positive mHealth outcomes. A large majority of interventions produced evidence of partial effectiveness or greater, despite limited post-intervention impacts observed in—and varying between—several studies. Participants in every study "highlighted the ease and convenience of the interventions; and the majority of the studies provided support for the efficacy of mHealth in reducing substance use." Participants also largely reported program messages to be interesting and motivating. However, results also indicated that the interventions "are used less and less as time passes unless there is regular contact and prompts with the participant; if the information is static, or relies on the participants' initiative to access, use declines within a week or two" (p. 413, 416-428).

The partial yet encouraging results of various mHealth interventions suggest that improved outcomes may be possible through focusing on individual differences and needs, such as severity of substance use, gender, age, and educational setting. High attrition rates and decreased participant engagement further indicate a need to identify and address barriers to engagement, for example, by increasing the frequency and personal relevance of contact. mHealth interventions may also improve through longer-term follow-ups to evaluate whether effects last post-intervention, and how to facilitate and sustain these positive outcomes (p. 428-429).

Findings support increasing evidence that "mHealth technology is a promising means to address substance use and warrants further development and study." Technology-based

interventions have been shown to lower substance use when applied in real-life, real-time contexts, and mHealth offers an encouraging means to reduce substance use either by itself or through enhancing traditional techniques. Their use in future practice "can be an integral part of reducing substance use" (p. 428-430).

CITATION

Kazemi, D. M., Borsari, B., Levine, M. J., Li, S., Lamberson, K. A., & Matta, L. A. (2017). A systematic review of the mHealth interventions to prevent alcohol and substance abuse. Journal of Health Communication, 22(5), 413-432.

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Article 4: Smartphone Apps for Managing Alcohol Consumption: A Literature Review

Summary

By offering an inexpensive and accessible means of delivering education, support, and monitoring, smartphone applications (apps) designed to reduce harmful alcohol consumption show potential to overcome many of the barriers to traditional intervention. With the recent focus in digital health increasingly switching to such treatments, researchers evaluated current studies on alcohol reduction apps and the availability of evidence-based apps in commercial app stores to examine their reach and effectiveness (p. 1- 2).

Nineteen studies assessed whether alcohol reduction apps lowered the frequency and/or volume of alcohol consumption in adult and youth populations. Among youth, available evidence for the efficacy of apps studied is inconclusive, with evaluation results "not showing a clear benefit in reducing alcohol consumption compared to control groups." Only 3 of 7 apps investigated found either a significant decrease in alcohol consumption outcomes versus control groups, or a significant decrease in the proportion of participants reporting post-intervention binge drinking compared to baseline (p. 2-8).

Results for apps targeting adults were more promising, yet still mixed. Of 12 studies examined, seven "found significant reductions in alcohol consumption measures, four found no significant reductions, and one found a significant increase in alcohol consumption in the intervention groups" (p. 9-14).

Research further revealed that only 8 of 19 apps evaluated were publicly available in commercial app stores. Of these eight, "only four were demonstrated in the literature to lead to a reduction in alcohol consumption measures," and their availability varied by country. Contrasting the limited number of alcohol consumption apps assessed, there are currently hundreds of such apps publicly available in top commercial stores, though few are evidence-based (p. 14).

Despite mixed study results, "established evidence on digital health interventions more broadly does appear to show a benefit in reducing alcohol consumption over those receiving no intervention." Overall, evidence for alcohol reduction apps is promising but inconclusive, with few apps examined in current studies accessible in commercial app stores. Considering the absence of more scientifically evaluated apps, well-constructed analyses of commercial app stores "could potentially assist in identifying the highest quality apps that are publicly available" (p. 13-16).

CITATION

Colbert, S., Thornton, L., & Richmond, R. (2020). Smartphone apps for managing alcohol consumption: a literature review. Addiction Science & Clinical Practice, 15, 1-16.

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Article 5: Parental Mediation in the Digital Era: Increasing Children's Critical Thinking May Help Decrease Positive Attitudes Toward Alcohol

Summary

Investigating youth engagement with alcohol brands on social media, researchers analyzed whether discussion-based parental mediation that nurtures critical thinking lowers negative effects of youth interaction with alcohol-related media messages. The methods examined how alcohol-related content shared via social networking sites influences young people's norms, expectations, and behaviors, and appraised the impact of parental development of children's media literacy skills (p. 98, 99).

Researchers assessed 658 undergraduate students' reports of parental mediation behaviors to measure their current alcohol decision making. Findings demonstrated a significant pattern in which prior parental mediation led to healthier outcomes, and absent or limited parental mediation led to unhealthy outcomes. Children of parents who critiqued media messages "reported more critical thinking skills, which predicted less interaction with alcohol brands on social media and fewer expectancies toward alcohol." Alternately, youth whose parents endorsed media depictions of drinking reported fewer critical thinking skills, increased identification with portrayals of use, a greater belief in the realism of depictions of use, and a resulting increase in the likelihood of interacting with alcohol brands on social media (p. 99-102).

Results additionally suggest that when engaging with alcohol brands, young people without previous mediation un-critically embrace pro-consumption messages, and "at higher levels of engagement with these messages, young people express greater perceived realism, more similarity, and greater expectancies toward alcohol consumption." As a result, portrayals

of alcohol consumption on social media "are likely to increase viewers' engagement with alcohol and to contribute positively to pro-drinking decision making" (p. 103-105).

Study outcomes indicate that improving young people's critical thinking skills about alcohol messaging on social media effectively helps them make healthier decisions. Consequently, it appears "educational efforts concerning alcohol would benefit by including a media literacy component." Such parental mediation strategies conducive to discussion may lead to positive health effects in our increasingly digital era, and "educational materials, health campaigns, and/or training aimed at encouraging and empowering parents in these discussions may be an important aid in reducing problematic drinking among youth." (p. 105) (p. 106) (p. 105, 106).

CITATION

Radanielina Hita, M. L., Kareklas, I., & Pinkleton, B. (2018). Parental mediation in the digital era: increasing children's critical thinking may help decrease positive attitudes toward alcohol. Journal of Health Communication, 23(1), 98-108.

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Conclusion

This review aimed to introduce readers to current, relevant research exploring the topic of promising online and digital interventions and initiatives in public health. As we have discussed in previous research reviews, online interventions offer the opportunity to use the affordances of internet and technology-enhanced learning environments to offer low-cost, accessible initiatives at scale. In the latest review, five studies investigated how mobile apps, online feedback, and media literacy efforts can contribute to reducing the harmful effects of substance use and abuse.

Hita et al (2018) explored how increasing children's critical thinking skills, often through discussing how the media portrays alcohol use in a positive light, may lead to children making healthier decisions about substance use.

Colbert et al (2020) investigated the relationship between smartphone apps for managing alcohol consumption and alcohol use, finding that there is a benefit to using these apps, especially when compared to no intervention at all.

In a systematic review of mobile health apps, Kazemi et al (2017) found that a number of these apps reported evidence of partial effectiveness, and that participants found them interesting and motivating.

Copeland and colleagues (2017) investigated the effectiveness of personalized motivation programs for reducing cannabis use, finding that both brief and extended feedback was found to be useful in reducing participants' cannabis use.

Milward (2018) explored what makes online substance use programs motivating, reporting that tailoring, reminders, and engaging, multimedia content is rated highly by participants, with potential multiplying effects when more than one strategy is used.

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Author Biographical Information

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