International Journal of Health Sciences and Research
Volume 14; Issue: 3; March 2024
Website: www.ijhsr.org
Systematic Review *ISSN: 2249-9571*

A Systematic Review of Digital Intervention of Smoking Abstinence During the COVID-19 Era

Samia Amin[1], Meer Sadad Billah[2], Eida Jahra Jarin[3], Ishra Jalal[4], Mashiat Faizah[4], Shababa Tasneem Hossain[5]

[1]Macquarie University, Australia,
[2]NYIT College of Osteopathic Medicine, United States,
[3]Sylhet Women's Medical College, Bangladesh,
[4]Khulna Medical College, Bangladesh,
[5]Popular Medical College, Bangladesh

Corresponding Author: Samia Amin

DOI: https://doi.org/10.52403/ijhsr.20240307

ABSTRACT

Background and Purpose: The COVID-19 pandemic created unique challenges for smoking cessation efforts. Mobile health (mHealth) interventions like smartphone apps and text messaging represent a promising approach to support quitting during the pandemic, but evidence of their effectiveness in the COVID context has been limited. This systematic review aimed to synthesize evidence on mobile phone-based interventions for smoking cessation during the COVID-19 pandemic, describing study and intervention characteristics and evaluating impacts on smoking abstinence outcomes.
Materials and Methods: A systematic literature search of PubMed, MEDLINE, and EMBASE was conducted for experimental studies on mobile phone interventions for smoking cessation published during the COVID-19 pandemic from 2021 to 2023. Study selection and data extraction were performed independently by two reviewers. Eligible studies were described narratively.
Results: Six studies with 3,878 total participants met the inclusion criteria. Across the 6 studies, mobile phone interventions generally showed some positive impacts on quit intentions, attempts, and abstinence compared to control groups, but most differences were not statistically significant. Two studies found slight increases in quit intention associated with smoking cessation messaging. One study showed a higher rate of quit attempts in the past 24 hours and 12 months among the intervention group, and two studies showed higher abstinence rates at certain follow-ups in intervention arms, though not reaching significance.
Conclusion: Overall, the evidence implies text messaging and mobile apps could confer benefits for cessation, but current research has not definitively confirmed their efficacy. Mobile phone interventions demonstrate preliminary potential to aid smoking cessation during the pandemic, but high-quality randomized controlled trials are needed to firmly establish their efficacy. Advancing mHealth solutions is critical to address elevated tobacco use risks during COVID-19.

Keywords: COVID-19; Cessation; Digital Health; Intervention; Smoking

INTRODUCTION

Tobacco smoking is a major preventable cause of morbidity and mortality worldwide, contributing to over 8 million deaths per year [1]. The COVID-19 pandemic that emerged in 2020 created additional challenges for smoking cessation efforts, as many smokers increased cigarette consumption due to stress, anxiety, and social isolation during lockdowns [2]. Mobile health (mHealth) interventions delivered via smartphones represent a promising approach to support smoking abstinence during the pandemic. However, evidence of their effectiveness has been limited, specifically within the COVID-19 context.

This systematic review aimed to synthesize current evidence on mobile phone-based interventions for smoking cessation during COVID-19. With widespread smartphone ownership globally, mHealth solutions could provide accessible support for quitting anytime and anywhere. Text messaging interventions, in particular, have shown efficacy for behavior change across diverse health issues [3]. Understanding optimal mHealth approaches for smoking abstinence could inform innovation in digital cessation initiatives needed amidst the ongoing pandemic.

We systematically reviewed experimental studies on mobile phone interventions for smoking cessation published during the COVID-19 pandemic. The objectives were to 1) synthesize study characteristics, intervention features, and sample demographics; 2) evaluate evidence on interventions' impact on quit intentions, attempts, and abstinence; and 3) determine key limitations and future research needs to advance mHealth for smoking cessation during and after the pandemic. This rigorous synthesis provides insights to guide the development of effective digital interventions for quitting smoking in the COVID-19 era and beyond.

MATERIALS & METHODS

Literature search

A systematic literature search was performed using PubMed, MEDLINE, and EMBASE databases. The search included a combination of relevant keywords and index terms covering the concepts of mobile phone technology, smoking/tobacco cessation, and study designs. For mobile phone technology, the terms searched were: smartphone, mobile phone, cell phone, mobile health, mHealth, text messaging, text message, short message service, SMS, mobile app, mobile application, social media, Facebook, Twitter, Instagram, WhatsApp, and video call. The terms for smoking/tobacco cessation were: smoking, tobacco, cigarette, nicotine, cessation, quitting, and abstinence. The terms for study designs were: intervention, program, randomized controlled trial, clinical trial, experiment, and study.

We identified relevant studies published between 2021 and 2023 in the COVID-19 pandemic era, which is generally considered from early 2020 through the present day in 2023, as the virus continues to circulate globally [4]. This review focused on synthesizing evidence from experimental studies on the effectiveness of mobile phone-delivered interventions in improving smoking cessation outcomes, including abstinence, intention to quit, and quit attempts.

Study selection and eligibility criteria

The review included experimental studies testing mobile phone-based interventions for smoking cessation compared to controls among current cigarette smokers, reporting on outcomes like abstinence, intention to quit, quit attempts, and published in English peer-reviewed journals. Articles were excluded if they were not written in English or if they were not peer-reviewed. The reference lists of all relevant articles were also screened to ensure all eligible studies were included.

Eligibility assessment was performed independently by two reviewers based on the pre-defined inclusion/exclusion criteria. The search identified 392 studies (Figure 1). All papers from the automated database searches were collated using the Endnote reference management software. After 209 duplicate articles were deleted, screening was conducted to ensure that studies fulfilled the eligibility criteria. A total of 183 papers were screened on title and abstract, and the 79 remaining papers were screened on full text. A total of 6 studies were eligible for inclusion in this review (Figure 1). Six reviewers independently assessed the included studies, and discrepancies were discussed and resolved by discussion. The inter-coder agreement was measured by K statistic. Each reviewer documented clear reasons for exclusion.

Data extraction and reporting method

The following details were extracted using a structured form: (1) General characteristics of the study (Author, publication year, study design, recruitment characteristics); (2) participants characteristics; (3) Intervention characteristics, and (4) main findings of intention and attempts to quit smoking and successful abstinence. As outcome measures varied across the studies, heterogeneity, variability, reporting issues, and methodological limitations (including effect sizes, standard errors, p-values, sample sizes per group, etc.) of the available set of studies, we could not perform meta- analysis; instead, narrative synthesis was conducted. Each study was described, followed by comparative analysis and synthesis. We followed PRISMA guidelines to ensure a rigorous, comprehensive, and transparent reporting of this systematic review process [5].

RESULT

Study characteristics

Three studies utilized a randomized controlled trial design [6-8]. The other three studies were quasi-experimental in nature [9-11]. The three RCTs reported randomizing participants to study groups [6-8]. Only one study reported using blinding and allocation concealment [6]. Table 1 summarizes the study characteristics. All six studies recruited participants between 2019-2022, with most recruiting during 2020 at the height of the COVID-19 pandemic [6-11]. The studies used varied data collection methods, including online surveys, in-person surveys, telephone interviews, Facebook recruitment, and mail surveys [6-11].

Participants characteristics

Across the six smoking cessation studies, the total number of participants was 3,878. The total sample size ranged from 23 to 1,509 across the individual studies. There were 1,958 total participants for the intervention groups, with individual study intervention groups ranging from 12 to 1,509 participants. The control groups totaled 1,100 participants, with individual study control groups ranging from 11 to 194 participants. The average mean age reported across studies was 41.9 years, with individual study mean ages from 35.82 to 52 years. For gender, 36.1% of the total participants were male (n=1,401) and 27.3% were female (n=1,059). The remaining 36.6% of participants were not reported by gender. In summary, the studies included nearly 4,000 total smokers, with typically larger intervention groups compared to control groups, average mean age in the early 40s, and a majority male participant population based on the gender percentages reported.

Intervention characteristics

Five of the six studies used mobile text messaging as the primary intervention tool [6-7, 9-11]. All six studies tested smoking cessation interventions with components like personalized messaging, motivational content, education, etc. [6-11]. The control groups received standard smoking cessation treatment, generic text messaging, or no intervention [6-9]. The intervention durations ranged from immediate delivery of messages to interventions lasting 5 months [6-11].

Main outcome

Quit intention

Most studies assessed quit intention at baseline [6-7, 9-11]. Intention to quit smoking was generally higher in the intervention groups compared to the control, but the differences were often not statistically significant [6-7, 9, 11]. Two studies showed exposure to smoking cessation messages was associated with small increases in quit intention scores [10-11].

Quit attempts

Three studies reported data on quit attempts [6-8]. One study found no difference between groups [7]. One study found a higher rate of quit attempts in the past 24 hours and past 12 months in the intervention group compared to control, but not statistically significant [6]. One study found

a higher 7-day point prevalence of abstinence at weeks 8 and 9 in the intervention group compared to control, but differences were not statistically significant [7].

Successful abstinence

Three studies reported abstinence outcomes [6-8]. Two studies found no significant differences in 7-day point prevalence abstinence between intervention and control groups at various follow-up time points [6, 8]. One study found no difference in 6-month prolonged abstinence [6]. Two studies showed higher abstinence rates in the intervention groups compared to control at certain time points, but differences were not statistically significant [7-8]. Table 2 summarizes the study outcomes.

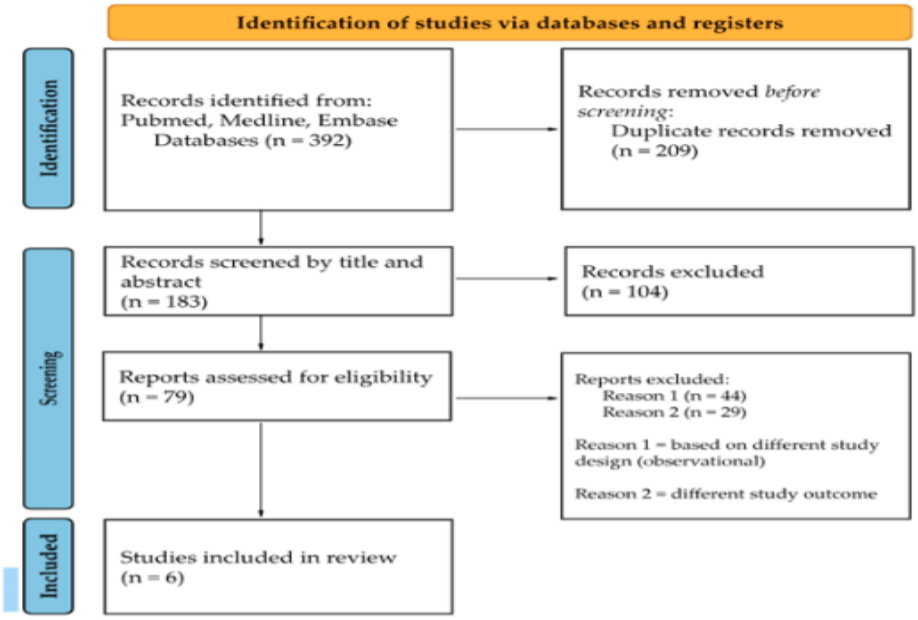

Figure 1. Prisma flow diagram for identification of studies via databases and registers

Table 1. Included study and participants' characteristics

Author, Year and Country	Study design	Recruitment methods Study setting, data collection	Study participants N (total); age range (years); mean age (years) ± SD; gender
Brown et al, 2023, UK	Quasi-Experimental	● Recruitment: Sep-Oct 2020 ● Data collection: Online ● Intervention tool: Mobile text message ● Intervention: Current cigarette packet images with a COVID-19-related death text warning. ● Control: Current cigarette packet images with a non-COVID-19-related death text warning. ● Intervention duration: Immediate ● Randomization: Done ● Blinding/Allocation concealment: NR	● Intervention (n): 119 ● Control (n): 121 ● Mean age: 35.82±12.3 ● Male: 50% (120) ● Female: 50% (120)
Luk et al, 2022 Hong Kong	Randomized Control Trial	● Recruitment: Jun-Jul 2020 ● Data collection: In person (at Baseline + telephone interview (at Follow-up) ● Intervention tool: Mobile text message ● Intervention: Real-time, personalized chat messaging on relapse prevention via WhatsApp for 3 months + standard smoking cessation treatment ● Control: Received generic text messaging on the harms of smoking and benefits of quitting for 3 months + standard smoking cessation treatment ● Intervention duration: 3 and 6 months ● Randomization: Done ● Blinding/allocation concealment: Done	● Total (N): 108 ● Intervention (n): 54 ● Control (n): 54 ● Mean age: 45.1 ± 10.9 ● Male: 75% (81) ● Female: 25% (27)

Mhende et al, 2023 USA	Randomized Control Trial	● Recruitment: Jan-Feb 2020 ● Data collection: In-person+ web-based+ telephone surveys (baseline and follow-up) ● Intervention tool: Mobile text message ● Intervention: In-person MBAT treatment + iQuit Mindfully text messages + self-help material + nicotine patch therapy ● Control: iQuit Mindfully text messages + self-help material+ nicotine patch therapy ● Intervention duration: 8 weeks ● Randomization: Done ● Blinding/Allocation concealment: NR	● Total (N): 23 ● Intervention (n): 12 ● Control (n): 11 ● Mean age: 52.0 ± 9.3 ● Male: 65.2% (15) ● Female:(34.8% (8)
Patten et al, 2022 USA	Randomized Control Trial	● Recruitment: Dec 2019- Mar 2021 ● Data collection: Telephone + Facebook + mail ● Intervention tool: Facebook group intervention ● Intervention: Evidence-based cessation treatments (EBCTs) + a 3-month, closed (private), culturally tailored, Facebook group ● Control: Evidence-based cessation treatments (EBCTs) ● Intervention duration: 6 months ● Randomization: Done ● Blinding/allocation concealment: Done	● Total (N): 61 ● Intervention (n): 31 ● Control (n): 30 ● Mean age: 40.3 ± 11.9 ● Male: 37.7% (23) ● Female: 62.2% (38)
Pettigrew et al. 2021 Australia New Zealand UK	Quasi-experimental	● Recruitment: Apr-May 2020 ● Data collection: Online ● Intervention tool: Mobile text message ● Intervention: Smoking cessation messages (message 1+2: Covid-related quit focus; message 3: risk of chest infection, message 4: financial focus) ● Control: No control group ● Intervention duration: Immediate ● Randomization: Done ● Blinding/ /allocation concealment: NR	● Total (N): 1,509 ● Intervention (n): 1,509 ● Mean age: 45.8 ±15.3 ● Male: 50.4% (761) ● Female: 49.6% (748)
Phetphum et al, 2022 Thailand	Quasi-experimental	● Recruitment: Jun- Nov 2022 ● Data collection : Online ● Intervention tool: Mobile text message + video calls + vinyl banners + broadcasting ● Intervention: Communication intervention (education online + motivation via social network + local mass media) ● Control: No intervention ● Intervention duration: 5 months ● Randomization: NR ● Blinding/allocation concealment: NR	● Intervention (n): 233 ● Control (n): 194 ● Mean Age: 47.5 ±14.0 ● Male: 93.9% (401) ● Female: 6.1% (26)

Table 2. Included study outcomes

Author, Year and Country	**Quit intention [Intent to quit smoking within a point of time]**	**Quit attempts [action to quit smoking at any point of time]**	**Quit successfully [without any Cigarettes throughout a period of time]**
Brown et al, 2023, UK	Intend to quit: Intervention 3.61 (1.79%) vs control	Quit attempt: Intervention 3.96 (3.01%) vs Control 4.75 (4.50%), p = 0.112	NR
Luk et al, 2022 Hong Kong	Intend to quit (Baseline): within 3-30 days	Quit attempt: Previous 24 hours ● <12 months: 17 (15.7%) ●<12 months: 80 (74.1%) ● Never: 11 (10.2%)	Abstinence: ● 7-day point prevalence at 3 months: Intervention 39 (72.2%) vs. control 39 (72.2%), p=1.00 ● 7-day point prevalence at 6 months: Intervention 31(57.4%) vs. control 36(66.7%), p=0.32 ● 6-month prolong abstinence: Intervention 26 (48.1%) vs. control 27 (50.0%), p=0.85
Mhende et al, 2023 USA	Intend to quit: 8 (38.1%) High 4 (50.0%) vs low intention 4 (50.0%)	NR	Abstinence: ● 7-day point prevalence at week 8: Total 10 (52.6%); Intervention: 7 (70.0%) vs. control: 3 (33.3%) ● 7-day point prevalence at week 9: Total 11 (52.0%); Intervention: 6 (54.5%) vs. control: 5 (50.0%)

Patten et al, 2022 USA	NR	NR	Abstinence: ● 7-day point prevalence at month 1: Intervention 3 (15.8%) vs. control 1 (4.4%), p=.24 ● 7-day point prevalence at month 3: Intervention 2 (10.0%) vs. control 5 (22.7%), p=.28 ● 7-day point prevalence at month 6: Intervention 3 (17.7%) vs. control 7 (38.9%), p=.17
Pettigrew et al. 2021 Australia New Zealand UK	Intend to quit: ● At 2 weeks: 476 (31.5%) ● At 2 months: 778 (51.6%) ● Never: 225 (16.9%) Message exposure & quit intention: ● Message 1 vs. quit intention (pre-post mean score ± SD): 0.2 ± 0.7 ● Message 2 vs. quit intention (pre-post mean score ± SD): 0.3 ± 0.9 ● Message 3 vs. quit intention (pre-post mean score ± SD): 0.1 ± 0.6 ● Message 4 vs. quit intention (pre-post mean score ± SD): 0.1 ± 0.6	NR	NR
Phetphum et al. 2022 Thailand	Intend to quit: ● At baseline median (IQR) score: Intervention 26 (0.99) vs. Control 25 (0.86), p = 0.165 ● At follow-up mean score of between-group: effect size=0.717; 95% CI: 0.51–0.88, p<0.001	NR	NR

DISCUSSION

This systematic review synthesized evidence from 6 experimental studies on mobile phone-delivered interventions for smoking cessation during the COVID-19 pandemic. The findings indicate mobile health solutions like text messaging may have the potential to support smoking abstinence, but current evidence is limited and mixed.

Comparison with prior work

Previous systematic reviews and meta-analyses of text messaging interventions for smoking cessation have generally found them to be effective, though the magnitude of effects is small to moderate. A 2016 meta-analysis of 13 RCTs by (12)Scott-Sheldon et al. (2016) reported mobile phone-delivered interventions significantly increased the likelihood of abstinence up to 6 months compared to controls (Risk Ratio 1.67, 95% CI 1.46-1.90). However, the interventions showed smaller, non-significant effects at longer follow-up periods beyond 6 months (Risk Ratio 1.18, 95% CI 0.95-1.47).

In their 2016 Cochrane review, Whittaker et al. (2016) [13] pooled results from 13 RCTs comparing mobile phone interventions to control. At 6 months or longer follow-up, mobile phone interventions showed a 1.67 increased likelihood of abstinence versus control (RR 1.67, 95% CI 1.46–1.90). However, there was substantial heterogeneity across the trials.

These reviews highlight mobile health tools confer modest improvements in quit rates, which aligns with the non-significant trends toward higher abstinence observed in some of the COVID-era studies we reviewed. However, the pandemic context introduces unique stressors and barriers influencing smoking behavior and relapse risk, which could attenuate digital intervention effects. Financial stress, social isolation, health anxieties, and disrupted healthcare access during COVID-19 are documented factors associated with increased tobacco use that

may overwhelm purely digital approaches [14]. The early pandemic studies in our review had key limitations like lack of biochemical validation, short follow-up periods, and small, underpowered samples that restrict firm conclusions about mHealth efficacy amidst the challenges of COVID-19. More rigorous research is needed to clarify the impacts of text messaging and mobile apps on smoking cessation, specifically within the pandemic environment.

Strengths and limitations

This systematic review has several notable strengths supporting the validity of its methodology and conclusions. A comprehensive literature search was undertaken across multiple databases to identify relevant studies. Clear inclusion/exclusion criteria were pre-defined, and rigorous screening by 2 independent reviewers was used to determine study eligibility. Data extraction was standardized using a structured form to systematically collect details about study characteristics, interventions, outcomes, and more. The review synthesized evidence across multiple experimental studies related to mobile phone interventions for smoking cessation during COVID-19, providing an overview of available evidence, including summarizing main findings, comparing to prior work, and analyzing limitations. Moreover, PRISMA guidelines were followed to ensure transparent, complete reporting of the review processes and findings.

This review has several limitations. The small number of eligible studies and variability in interventions, measures, and outcomes precluded meta- analysis. Most included studies had methodological weaknesses like lack of blinding, randomization, and biochemical confirmation of abstinence. Self- reported cessation outcomes are subject to recall and social desirability biases. The samples were predominantly male, which may not generalize findings to female smokers. Studies were underpowered to detect small effects on cessation. Most studies were pilot or quasi-experimental trials, indicating the need for more rigorous RCTs on COVID-era mobile interventions.

CONCLUSION

In conclusion, mobile phone-based interventions show preliminary potential to support smoking abstinence during COVID-19, but current evidence is mixed and limited. High-quality RCTs with biochemical verification of abstinence, longer follow-up, improved retention, sample diversity, and adequate power are needed to firmly establish the efficacy of text messaging and mobile apps for cessation amidst the ongoing pandemic. Cost-effectiveness studies and qualitative assessments of user perceptions could further inform optimization of mHealth tools. Ultimately, advancing digital solutions for smoking cessation is critically important to mitigate tobacco-related risks posed by COVID-19.

Declaration by Authors

Ethical Approval: Not applicable

Acknowledgement: None

Source of Funding: None

Author Contributions: Conceptualization, S. A; methodology, S.A and M.B; formal analysis, S.A and M.B.; writing - original draft preparation, S.A and M.B; writing - review and editing, E. J, I. J, M. F and S.H; supervision, S.A.

Conflict of Interest: The authors declare no conflict of interest.

REFERENCES

1. World Health Organization. Tobacco Fact Sheet. Available online: https://www.who.int/news-room/fact-sheets/detail/tobacco Updated July 26, 2022. (Accessed on 22 August 2023.)
2. Jackson, S. E.; Brown, J.; Shahab, L., Steptoe, A.; & Fancourt, D. (2021). COVID-19, smoking and inequalities: a study of 53 002 adults in the UK. Tobacco control, 30(e2), e111–e121. https://doi.org/10.1136/tobaccocontrol-2020-055933
3. Hall, A. K.; Cole-Lewis, H.; & Bernhardt, J. M. (2015). Mobile text messaging for health: a systematic review of

reviews. Annual review of public health, 36, 393–415. https://doi.org/10.1146/annurev-publhealth-031914-122855

4. Cucinotta, D.; & Vanelli, M. (2020). WHO Declares COVID-19 a Pandemic. Acta bio-medica : Atenei Parmensis, 91(1), 157–160. https://doi.org/10.23750/abm.v91i1.9397
5. Moher, D.; Liberati, A.; Tetzlaff, J.; Altman, D. G.; & PRISMA Group (2009). Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. Journal of clinical epidemiology, 62(10), 1006–1012. https://doi.org/10.1016/j.jclinepi.2009.06.005
6. Luk, T. T.; Cheung, Y. T. D.; Chan, H. C.; Fok, P. W.; Ho, K. S.; Sze, C. D.; Lam, T. H.; Wang, M. P. Mobile Chat Messaging for Preventing Smoking Relapse Amid the COVID-19 Pandemic: A Pilot Randomized Controlled Trial. Nicotine Tob Res. 2023 Jan 5;25(2):291-297. https://doi.org/10.1093/ntr/ntac045
7. Mhende, J.; Bell, S. A.; Cottrell-Daniels, C.; Luong, J.; Streiff, M.; Dannenfelser, M.; Hayat, M.J.; Spears, C. A. Mobile Delivery of Mindfulness-Based Smoking Cessation Treatment Among Low-Income Adults During the COVID-19 Pandemic: Pilot Randomized Controlled Trial. JMIR Form Res. 2021 Jul 23;5(7):e25926. https://doi.org/10.2196/25926
8. Patten, C. A.; Koller, K. R.; Sinicrope, P. S.; Prochaska, J. J.; Young, C.; Resnicow, K.; Decker, P. A.; Hughes, C. A.; Merritt, Z. T.; McConnell, C. R.; Huang, M.; & Thomas, T. K. (2023). Facebook Intervention to Connect Alaska Native People With Resources and Support to Quit Smoking: CAN Quit Pilot Randomized Controlled Trial. Nicotine & tobacco research: official journal of the Society for Research on Nicotine and Tobacco, 25(4), 803–813. https://doi.org/10.1093/ntr/ntac221
9. Brown, C. R. H.; & Faulkner, P. (2023). Smokers' Affective Responses to COVID-19-Related Health Warnings on Cigarette Packets: The Influence of Delay Discounting. Nicotine & tobacco research : official journal of the Society for Research on Nicotine and Tobacco, 25(2), 221–227. https://doi.org/10.1093/ntr/ntab176
10. Pettigrew, S.; Jun, M.; Roberts, I.; Nallaiah, K.; Bullen, C.; & Rodgers, A. (2021). The Potential Effectiveness of COVID-Related Smoking Cessation Messages in Three Countries. Nicotine & tobacco research : official journal of the Society for Research on Nicotine and Tobacco, 23(7), 1254–1258. https://doi.org/10.1093/ntr/ntab023
11. Phetphum, C.; Prajongjeep, A.; Keeratisiroj, O.; & Thawatchaijareonying, K. (2022). Communication intervention to improve perceived threat of smoking-related COVID-19 and intentions to quit smoking during the COVID-19 pandemic in Thailand. Tobacco induced diseases, 20, 66. https://doi.org/10.18332/tid/150363
12. Scott-Sheldon, L. A.; Lantini, R.; Jennings, E. G.; Thind, H.; Rosen, R. K.; Salmoirago-Blotcher, E.; & Bock, B. C. (2016). Text Messaging-Based Interventions for Smoking Cessation: A Systematic Review and Meta-Analysis. JMIR mHealth and uHealth, 4(2), e49. https://doi.org/10.2196/mhealth.5436
13. Whittaker, R.; McRobbie, H.; Bullen, C.; Rodgers, A.; & Gu, Y. (2016). Mobile phone-based interventions for smoking cessation. The Cochrane database of systematic reviews, 4(4), CD006611. https://doi.org/10.1002/14651858.CD006611.pub4
14. Jackson, S. E.; Garnett, C.; Shahab, L.; Oldham, M.; & Brown, J. (2021). Association of the COVID-19 lockdown with smoking, drinking and attempts to quit in England: an analysis of 2019-20 data. Addiction (Abingdon, England), 116(5), 1233–1244. https://doi.org/10.1111/add.15295

How to cite this article: Samia Amin, Meer Sadad Billah, Eida Jahra Jarin, Ishra Jalal, Mashiat Faizah, Shababa Tasneem Hossain. A systematic review of digital intervention of smoking abstinence during the COVID-19 era. *Int J Health Sci Res.* 2024; 14(3):35-42. DOI: *https://doi.org/10.52403/ijhsr.20240307*

******