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Interactive voice response (IVR) for tobacco cessation: a systematic review

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ABSTRACT

Objective To summarise the uses, outcomes and implementation of interactive voice response (IVR) as a tobacco cessation intervention.

Data sources A systematic review was conducted. Searches were performed on 3 May 2023. The strategies used keywords such as "tobacco cessation", "smoking reduction" and "interactive voice recording". Ovid MEDLINE ALL, Embase, APA PsycINFO, CINAHL, Cochrane Library and Web of Science were searched. Grey literature searches were also conducted.

Study selection Titles and abstracts were assessed by two independent reviewers. Studies were included if IVR was an intervention for tobacco cessation for adults; any outcomes were reported and study design was comparative. Any abstract included by either reviewer proceeded to full-text review. Full texts were reviewed by two independent reviewers.

Data extraction Data were independently extracted by two reviewers using a standardised form. The Risk of Bias Tool for Randomised Trials and the Risk of Bias in Non-Randomised Studies of Interventions tools were used to assess study quality.

Data synthesis Of 308 identified abstracts, 20 moderate-quality to low-quality studies were included. IVR was used standalone or adjunctly as a treatment, follow-up or risk-assessment tool across populations including general smokers, hospitalised patients, quitline users, perinatal women, patients with cancer and veteran smokers. Effective studies found that IVR was delivered more frequently with shorter follow-up times. Significant gaps in the literature include a lack of population diversity, limited implementation settings and delivery schedules, and limited patient and provider perspectives.

Conclusions While the evidence is weak, IVR appears to be a promising intervention for tobacco cessation. However, pilot programmes and research addressing literature gaps are necessary.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ This was a thorough and comprehensive search of the literature created by an experienced medical information specialist and peer reviewed by another specialist. Six peer-reviewed databases were searched, along with grey literature searches and handsearches of the included studies.
⇒ There was significant heterogeneity in the interventions used, reported methods and outcome measures reported, meaning meta-analysis was not possible.
⇒ Limited populations and settings were assessed by the included studies, meaning generalisability is limited and significant gaps still remain.

INTRODUCTION

As of 2020, 22.3% of the global population reported using tobacco products—around 1.3 billion individuals.[1] The annual economic costs of tobacco use are significant, equalling an estimated US$ 1.4 trillion and 1.8% of the world's annual gross domestic product.[1] Over eight million deaths per year are attributed to direct and indirect tobacco use.[1] While current global tobacco control efforts contribute to decreasing the prevalence of tobacco use and associated morbidity and mortality rates, it is crucial to continue finding ways to support patients who want to make a quit attempt or change their smoking behaviour.

Interactive voice response (IVR) is a phone-based platform that can be used to deliver health behaviour interventions.[2] IVR can be used to deliver educational messages, reinforce behaviours, motivate and guide patients, record patient symptoms or outcomes, encourage medication adherence and connect patients with further resources or professionals.[3] With IVR, a human speaker is replaced with a high-quality, prerecorded interactive script and responds to patients based on answers provided.[2] Patients can either call the IVR or receive calls. The possible advantages of IVR include its ability to make multiple calls during and outside regular business hours, connect with patients quickly and identify those who are at higher risk and more likely to benefit from continued support.[3 4]

IVR has been used in interventions for alcohol consumption, asthma, heart failure, obesity, sleep apnea, hypertension, high cholesterol, dietary behaviour, to increase physical activity and to improve medication adherence.[2] Effectiveness has been mixed,

with IVR having small but significant effects on medication adherence and physical activity, but limited effectiveness for alcohol consumption or dietary behaviour.[2] IVR has also been used as a tool to support tobacco cessation in patients, particularly posthospital discharge.[5] Postdischarge, patients receive tailored automated IVR calls at different time points.[5] The calls typically assess patients' current smoking status, intention to quit or confidence in staying quit, current cessation medication use and desire for additional support and provide motivational messages, encourage patients to stay quit or continue attempting, promote the use of cessation medication and offer to transfer patients to a counsellor.[5] IVR is also often used in conjunction with other interventions, such as alongside nicotine replacement therapy (NRT) or after counselling with a physician in-hospital or in a primary care setting.[5] However, the effectiveness of IVR as a tobacco cessation intervention for specific population groups, and the best uses and optimal delivery schedule of IVR interventions, are unknown.

This systematic review aims to synthesise and understand the current knowledge regarding IVR for tobacco cessation and to identify any gaps in the literature. Questions that guided this review included the ideal IVR delivery schedule, components of IVR, utilisation of the intervention, outcomes reported in the literature, patient and provider perspectives, and costs of using IVR for tobacco cessation.

METHODS

Search strategy

This systematic review followed a written, unregistered protocol and was conducted by following the Cochrane best practice guidelines and the Preferred Reporting Items for Systematic Reviews and Meta-Analyses reporting standards.[6 7] An experienced medical information specialist developed and tested the search strategies through an iterative process in consultation with the review team. The MEDLINE strategy was peer reviewed by another senior information specialist using the PRESS Checklist.[8] The strategies used a combination of controlled vocabulary (eg, "Smoking Reduction", "Tobacco Use Cessation", "Reminder Systems") and keywords (eg, "quit smoking", "curtail tobacco", "interactive voice response"). Vocabulary and syntax were adjusted across the databases. Using

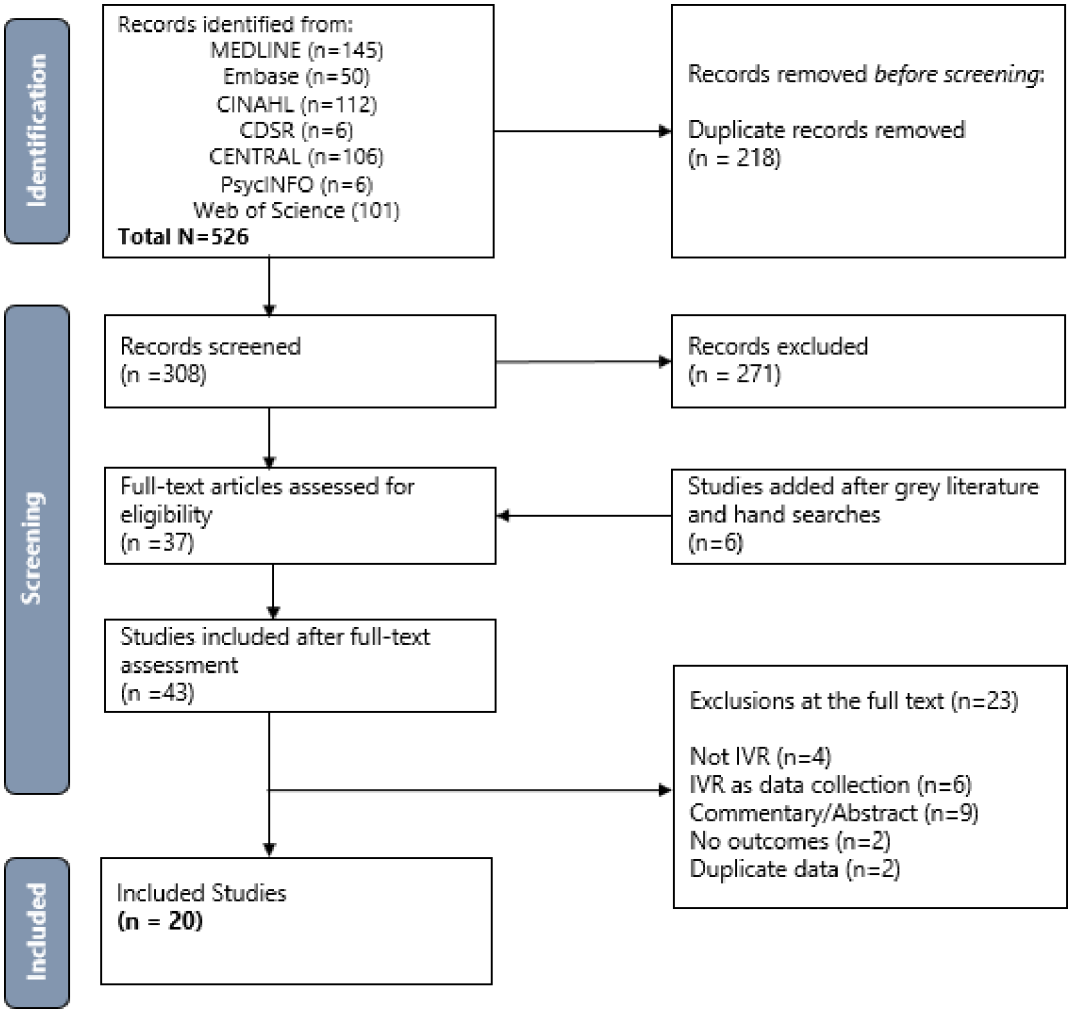

Figure 1 PRISMA for systematic review. CDSR, Cochrane Database of Systematic Reviews, IVR, interactive voice response; PRISMA, Preferred Reporting Items for Systematic Reviews and Meta-Analyses.

the multifile option and deduplication tool available on the Ovid platform, we searched Ovid MEDLINE ALL, Embase, APA PsycINFO, CINAHL (Ebsco), the Cochrane Library (Wiley) and Web of Science (Core Databases). No language restrictions were placed on the search. Records were downloaded and deduplicated using EndNote V.9.3.3 (Clarivate Analytics). All databases were searched from inception to 3 May 2023. The final search strategy is available in online supplemental appendix A.

Grey literature searches were conducted through the Canadian Agency for Drug and Technologies in Health Grey Matters database, a database of government reports and non-commercially published reports, and preprint databases including medRixV and Research Square. Targeted Google searches were also conducted to identify any relevant reports that may have been missed by these databases.

Study selection

A calibration exercise was conducted by four reviewers on a sample of the retrieved abstracts. After 100% agreement was reached among reviewers, the remaining abstracts were screened in duplicate by two independent reviewers. Abstracts selected for inclusion by either reviewer proceeded to full-text review. This initial screen was intentionally broad to ensure that all relevant literature was captured. Abstracts proceeded to full-text review if IVR was used as an intervention tool for tobacco cessation; IVR targeted adults; any outcomes were reported, including treatment completion, quit rates, smoking abstinence and patient perspectives; and was a comparative study, comparing IVR to any comparator. Any comparative study design was eligible for inclusion. Studies that reported other kinds of interventions but used IVR for data collection purposes were excluded.

Full texts were included if they met the above inclusion criteria and were in English. Conference abstracts, case series, reviews, letters and editorials were excluded. Along with grey literature databases, the reference lists of relevant systematic reviews were also searched. Full-text review was conducted in duplicate by two independent reviewers. Any discrepancies between reviewers were resolved through discussion and consensus.

Data extraction

For all included studies, year of publication, country, study design, target population, participant characteristics, intervention setting, purpose or use of IVR, details about IVR schedule and follow-up and outcomes were extracted by a single reviewer using standardised data extraction forms. A second reviewer verified the extracted data. Discrepancies between reviewers during data extraction were resolved through consensus.

Quality assessment

The quality of controlled trials was assessed using the revised Cochrane Risk-Of-Bias Tool for Randomised Trials[9] while the observational studies were assessed with the Risk of Bias in Non-Randomised Studies of Interventions tool.[10] Each controlled trial was assessed using five criteria broadly covering the areas of randomisation, deviation from intended intervention, missing outcome data, measurement of outcome and selection of reported results.[9] The observational studies were assessed based on

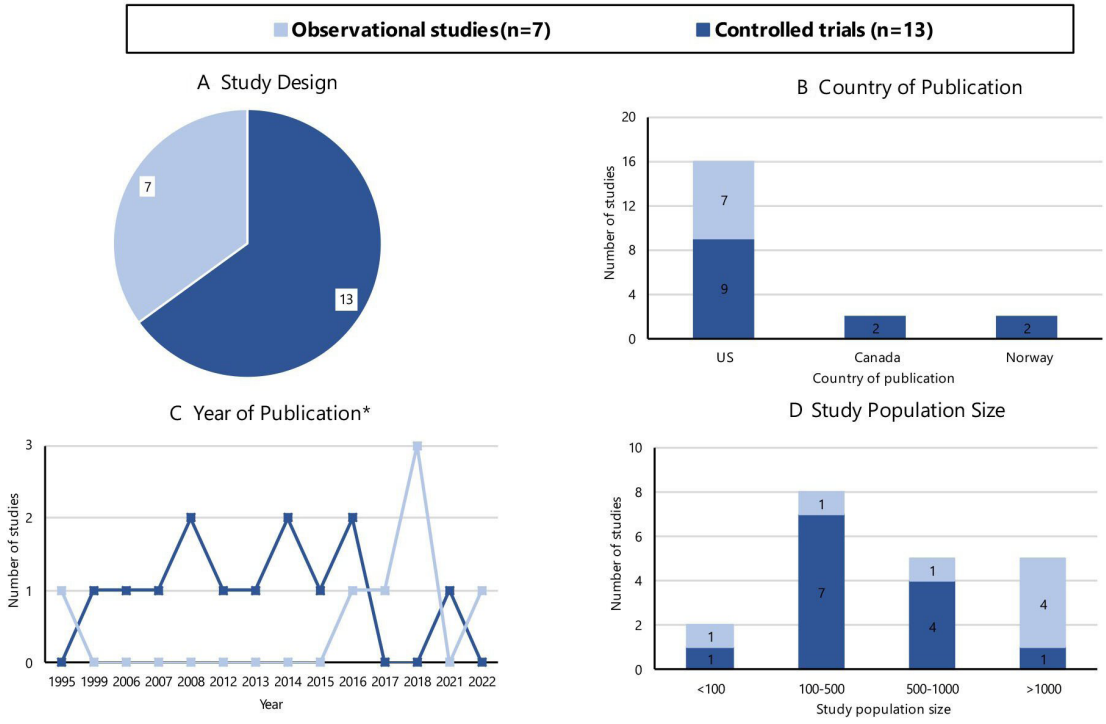

Figure 2 Summary characteristics of included studies. (A) Study design. (B) Country of publication. (C) Year of publication. (D) Study population size. *Only the 14 years with at least one publication are shown.

the following parameters: bias due to confounding, selection bias, bias in classification, bias due to deviations from intended interventions, bias due to missing data, bias in measurement and reporting bias.[10]

Quality assessment was completed by one reviewer and verified by a second reviewer.

Data analysis and synthesis

Significant heterogeneity of studies was expected. Therefore, a narrative approach to synthesis was adopted a priori. A stratified analytical approach by population was adopted. The types of interventions used, the outcomes reported, the effectiveness, overall trends and any gaps in the literature were assessed by population.

Patient and public involvement

There was no patient or public involvement in this review.

RESULTS

Overall results

The search strategy yielded 308 unique citations, 271 of which were excluded after abstract review (figure 1). Six studies were identified through hand and grey literature searches. Following abstract review, 43 studies proceeded to full-text review. At the full-text review phase, 23 studies were excluded for the following reasons: not IVR (n=4), IVR used as a data collection method (n=6), commentary or abstract (n=9), no outcomes (n=2) or duplicates (n=2) (figure 1).

The final dataset included 20 studies, including 13 controlled trials and seven observational studies (figure 2A). Sixteen of the included studies were conducted in the USA,[11–26] two were conducted in Canada[27 28] and the remaining two were conducted in Norway (figure 2B).[29 30] The included studies were published between 1995 and 2022 (figure 2C). In most of the studies (n=8), study sample sizes ranged between 100 and 500 participants while five studies each included between 500 and 1000 participants and >1000 participants, respectively. Only two studies included less than 100 participants (figure 2D). Online supplemental appendix B includes additional details on the characteristics and outcomes of the 20 studies.

Quality of included studies

Full risk of bias assessments can be found in online supplemental appendix C. The risk of bias assessment of the 13 controlled trials ranged from some concerns (n=7) to high risk of bias (n=6) (figure 3A). The most common critical weakness across the controlled trials was the deviation from intended intervention and the selection of reported results. However, most studies were assessed at a low risk of bias in the measurement of outcomes and the randomisation process.

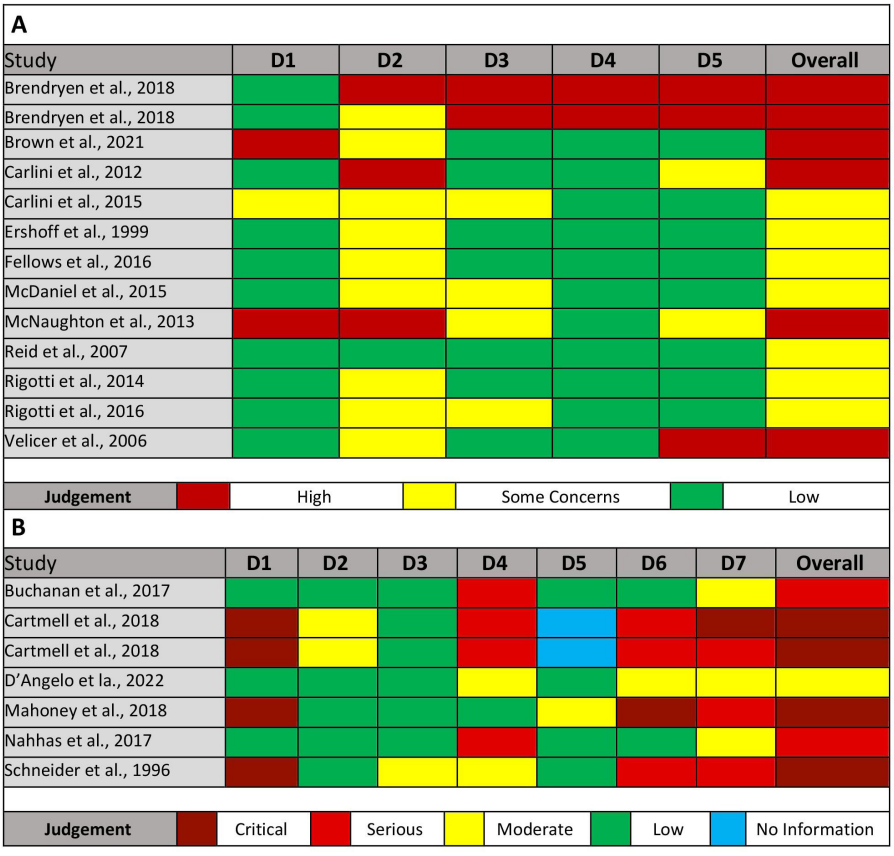

Figure 3 Quality assessment for included studies. (A) Risk of the bias—controlled trials. (B) Risk of the bias—observational studies.

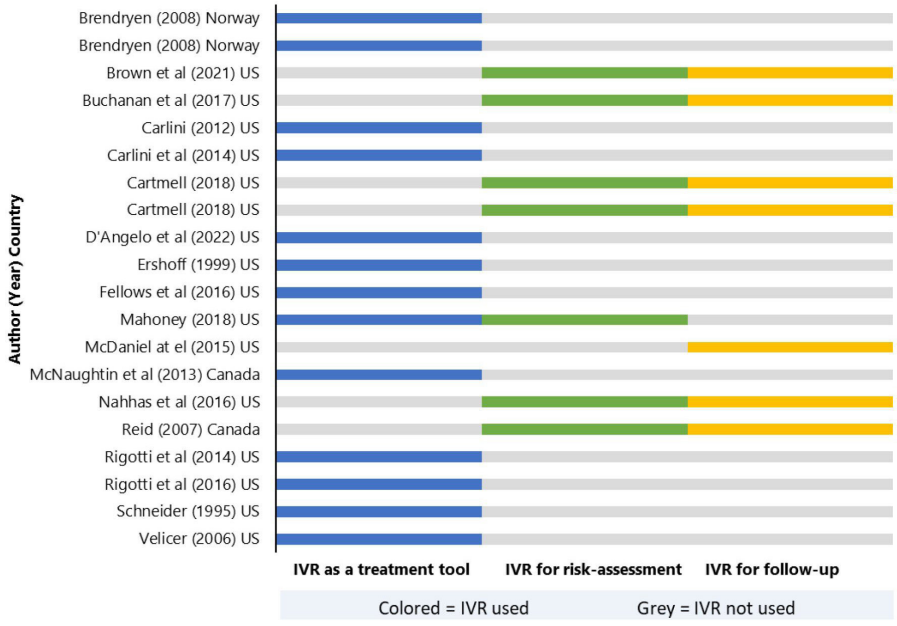

Figure 4 Timing of IVR use in the care trajectory. IVR, interactive voice response.

Overall, one observational study was assessed at a moderate risk of bias, two studies were at a high risk of bias and the remaining four studies were assessed at critical risk of bias. The most common critical weakness across studies was confounding, deviation from interventions, measurement of outcomes and the selection of reported results. Most of the observational studies were assessed at a low risk of bias in the classification of interventions and selection of participants for the study (figure 3B).

How was IVR used as an intervention?

Two uses of IVR were identified. Across the 20 studies, IVR was used as either a standalone (n=6) or an adjunct intervention (n=13) for tobacco cessation. The use of IVR was unclear in one study.[17] When used as a standalone intervention, IVR was the primary intervention reported in the study.[13 14 18 20 25 28] When used as an adjunct intervention, IVR was used in combination with other interventions including counselling, referrals, quitlines and web-based or SMS-based cessation activities.[11 12 15 16 19 21–24 26 27 29 30] In one study, participants were able to contact the IVR services[18]; in all other interventions, the IVR system contacted participants.

When in the care trajectory was IVR used?

Studies examined IVR use along different points in the care treatment trajectory. Included studies used IVR as a treatment tool, a follow-up tool and a risk-assessment tool (figure 4).

As a treatment tool, IVR asked questions regarding smoking habits, overall goals and fears surrounding tobacco cessation. IVR provided tailored behaviour change therapeutic responses based on answers given by the patients, through personalised motivational messages and advice, coping mechanisms and interactive activities. When IVR was used as a treatment tool, IVR delivery schedule varied widely for interventions with call schedules ranging from calls every day[20] to every 2, 12, 28, 68 and 88 days postdischarge[24] to every two weeks for 39 weeks.[27] In two studies, IVR was available on an as-needed basis where patients were called regularly in response to their unique requirements[29 30] and in two studies IVR was available 24/7 for participants to use when they wanted.[18 25]

As a follow-up tool, IVR was used postdischarge to monitor patients' progress and track tobacco behaviour, as well as provide personalised motivational messages and give patients direct access to resources such as requesting additional NRTs/pharmacotherapy and directing calls to a quitline or counsellor. Five studies delivered IVR at 3, 14 and 30 days postdischarge[12 15 16 22 28] and one delivered IVR at eight predetermined, yet unspecified, time periods over the course of 12 weeks postdischarge.[11] In all the studies that used IVR as a follow-up tool, IVR was also used as a risk-assessment tool.[11 28]

As a risk assessment tool, IVR assessed the risk of relapse based on responses to curated questions, flagging at-risk patients and connecting them to a counsellor, quitlines or nurse specialists to mitigate relapse and provide immediate support. Risk assessment was conducted differently across the different studies. As an example, one study specifically asked questions as part of a risk assessment for relapse and flagged 'at-risk' patients and directly transferred the call to a quit coach for brief intervention.[21] The frequency of IVR calls and follow-up times ranged widely.

For whom was IVR more likely to be effective?

IVR was used as a tobacco cessation intervention across multiple specific populations. Six studies targeted general adult smokers,[20 24 25 27 29 30] seven studies targeted

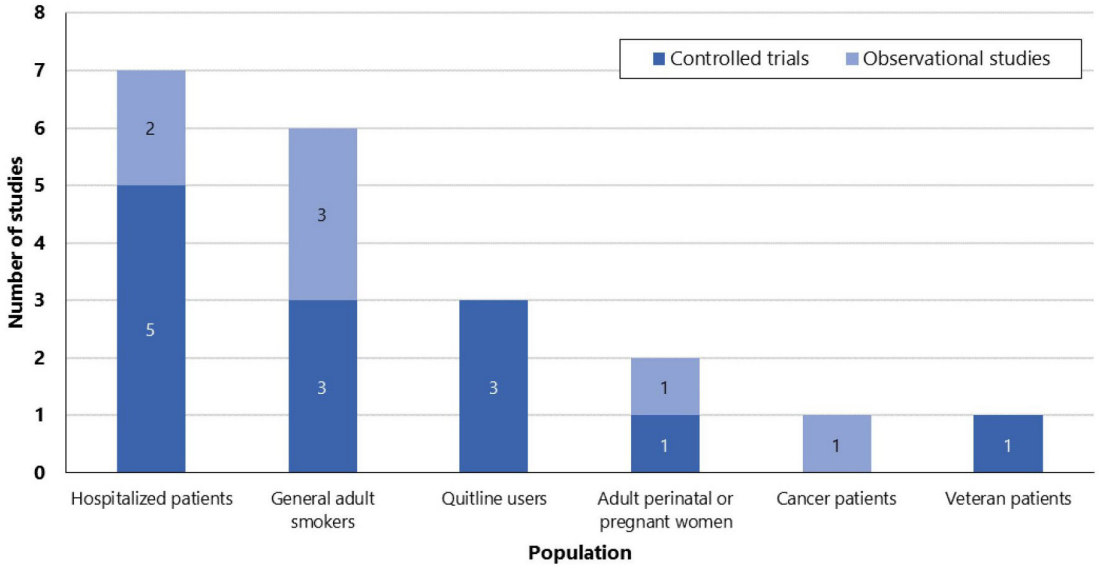

Figure 5 Populations assessed in systematic review.

hospitalised patients,[11 15 16 19 22 23 28] three studies targeted quitline users,[13 14 21] two studies targeted adult perinatal or pregnant women,[12 18] one study targeted cancer patients[17] and one study targeted veteran smokers (figure 5).[26]

General adult smokers

Of the six studies that looked at general adult smokers, four were controlled trials and two were observational studies.[20 24 25 27 29 30] Four controlled trials used IVR as an adjunct treatment tool. One reported biochemically confirmed abstinence rates and three reported self-reported point abstinence rates.[24 27 29 30] No statistically significant difference in past seven days biochemically confirmed abstinence was found at the six-month follow-up.[24] However, three controlled trials reported significantly higher self-reported point abstinence rates at 1, 3, 6 and 12 months follow-ups.[24 29 30]

One observational study used IVR as a standalone treatment tool and reported abstinence rates. Of participants who reported abstinence at the 1-month follow-up, 47.1% were still abstinent at the three-month follow-up and 37.3% were still abstinent at the six-month follow-up.[25] One observational study examined IVR as a treatment and risk assessment tool and focused on quit rates.[20] Overall, 30% of individuals who opted into the IVR programme were smoke-free at the last contact.

Hospitalised patients

Of the seven studies that included patients admitted to hospital, four were controlled trials and three were observational studies.[11 15 16 19 22 23 28] In the two controlled trials that used IVR as an adjunct treatment tool, one study found that 25.8% of intervention patients were biochemically confirmed abstinent in the past seven days (p=0.009) and self-reported abstinence rates in the past seven days at the one-month and six-month follow-ups were significantly higher in intervention patients.[23] However, the other study found no statistically significant difference in self-reported abstinence rates between intervention and usual care participants.[19] One controlled trial found that intervention patients were significantly more likely to be abstinent at six-month follow-up (8.9%) compared with usual care control patients (3.5%, p=0.01).[11] Finally, one controlled trial that examined IVR as a standalone follow-up and risk assessment tool reported abstinence rates and found no difference in abstinence rates between intervention and control groups.[28]

Two observational studies examined different outcomes of the same IVR follow-up programme. One study reported that IVR was associated with significantly lower total healthcare costs at 1-year postdischarge, with mean charges for the IVR group being over US$8000 less than the usual care control group.[15] The other study found no statistically significant reduction in odds of readmission between the IVR group and the usual care control group and no significant difference in readmission rates at 30, 90 or 180 days postdischarge.[16] IVR reach was also reported to be low as IVR only reached about 43% of eligible participants, and 36.4% of those reached reported abstinence since their last IVR call. The remaining observational study examined the reach of a hospital-based counselling and IVR tobacco cessation programme.[22] IVR reach was low as only 43% of eligible participants were reached. While no difference was found between IVR alone and bedside counselling with IVR, counselling with IVR was associated with an increase in response to IVR utilisation.[22]

Quitline users

Three controlled trials targeted tobacco cessation quitline users.[13 14 21] Two controlled trials used IVR as a standalone treatment tool. IVR intervention participants were significantly more likely to re-enrol into the quitline (28.2% intervention vs 3.3% usual care; p<0.001), though the proportion of those that re-enrolled was small.[14] Of those

followed up, 79.9% of those followed up reported making a quit attempt lasting 24 hours or more in the last 90 days, with 24.0% reporting abstaining from tobacco in the last seven days.[13] One controlled trial used IVR as an adjunct risk assessment tool reported quit rates in quitline users at two different IVR delivery schedules: twice weekly for 2 weeks then weekly for 6 weeks (10 calls total) or daily for two weeks and weekly for six weeks (20 calls total).[21] The intervention found no difference in abstinence rates between the two IVR delivery schedules and the frequency of IVR calls did not impact tobacco cessation. Those that did not screen as at risk for relapse during the scheduled IVR relapse risk assessments were 77% more likely to be abstinent at the six-month follow-up.[21]

Adult perinatal women

Two studies targeted adult perinatal women.[12 18] In the controlled trial, IVR was used as a standalone treatment tool and while 16.7% of IVR intervention participants were biochemically confirmed end-of-pregnancy quitters, there was no significant difference compared with usual care patients.[18] The observational study used IVR as an adjunct follow-up and risk-assessment tool. There was no difference in reported abstinence between participants who only received IVR and those who received bedside counselling with IVR.[12]

Patients with cancer

One observational study examined IVR as a treatment tool at cancer centres.[17] This study compared the effectiveness of multiple different tobacco cessation interventions, including IVR, implemented across 38 participating cancer centres. IVR was implemented at four out of the 38 cancer centres. Of all the cessation interventions, IVR had the greatest mean, median, minimum and maximum ranges for reach, with responses from an average of 56% of those reached by IVR. No IVR-specific or patient-specific abstinence rates were reported; however, 22% of patients reported not smoking in the past seven days and 19% not smoking in the past 30 days across all cancer centres and implemented interventions.[17]

Veteran smokers

One controlled trial examined IVR as an adjunct treatment tool targeting veteran smokers.[26] IVR was implemented in conjunction with a tobacco cessation manual, an expert system feedback report and NRT use. At follow-up, six-month prolonged abstinence rates at month 10 (6.6%), month 20 (9.3%) and month 30 (15%) showed a steady increase in abstinence, however, this increase was not statistically significant.[26]

What were the patient-reported experiences with IVR?

Only three studies, all controlled trials, included elements of patient-reported experience with IVR for tobacco cessation.[21 29 30] Most participants (96%) reported satisfaction with the overall quitline programme and almost all participants (98%) stated that they would likely recommend the programme to others.[21] Furthermore, most participants reported that it was easy to answer questions using the IVR system (95%) regardless of IVR delivery schedule.[21] Satisfaction with the IVR intervention was also highly positive, regardless of whether participants were given the option to use NRTs.[29 30]

What was the reach of IVR?

Eight studies reported reach of the IVR intervention.[12 14 17 18 20 22 25 26] The rate of participants interacting with IVR ranged from 20.8% to 42.8%.[12 14 17 18 20 22 25 26] In one study, IVR did have the highest average reach, compared with other smoking cessation interventions, with responses from 55.8% of those called by IVR; however, these results were at the institution level, not the individual level.[17]

Sex and gender in this literature

Only one study stratified outcomes by sex or gender; it is unclear which.[20] This observational study, of low quality, assessed IVR used as a standalone treatment and risk assessment tool for general adult smokers. It was found that females were significantly more likely to opt-in to the IVR intervention compared with males (OR 0.78; 95% CI 0.65 to 0.95). Of those that opted-in and received IVR calls, females were more likely to report being smoke free at last contact compared with males (OR 0.87; 95% CI 0.66 to 1.15), though this difference was not significant.[20]

DISCUSSION

Overall, 20 studies were included. There was a heterogeneous body of literature identified in the present review. IVR was implemented as either a standalone or adjunct technology. When implemented as an adjunct technology, IVR was often paired with inpatient and outpatient counselling, NRT or self-help materials, though the type of adjunct intervention did not impact effectiveness of IVR. IVR was also implemented at several points along the patient trajectory and was effective at increasing self-reported abstinence and increasing the use of other tobacco cessation interventions across multiple different populations, including general smokers, hospitalised patients, quitline users, adult perinatal or pregnant women, patients with cancer and veteran smokers. While the frequency of IVR calls and follow-up times varied widely in the literature and studies specifically comparing different IVR delivery schedules reported no differences between brief/short-term and sustained IVR delivery, increased IVR frequency and shorter time between follow-ups were generally associated with increased effectiveness of IVR. The studies that reported on costs reported that IVR reduced healthcare costs. However, IVR did not significantly affect other outcomes, including hospitalisation and biochemically confirmed abstinence. Additionally, the reach of IVR was consistently low. Despite the variability of findings, no application or use of IVR was shown to be harmful to participants and studies that reported patient perspectives were highly positive.

The results of our search are mixed on the effectiveness of IVR, and the use of IVR in other contexts is similarly mixed. Some studies report significantly improved patient outcomes with the use of IVR, particularly those for disease management and medication adherence[31–33]; others, however, report minimal effectiveness of IVR, particularly for alcohol dependence.[34–36] The studies on alcohol dependence found that while clinical outcomes were not different, IVR was useful for self-monitoring and provided regular feedback on alcohol use to patients.[35 36] Additionally, most studies noted that IVR is relatively inexpensive and can have a high reach, particularly for otherwise hard-to-reach patients, meaning it may be useful in keeping patients engaged in treatment even if clinical effectiveness is low.[33–36] These findings, along with the results of our search, may suggest that IVR for tobacco cessation may be most effective when used as a way of engaging patients in treatment rather than as a treatment itself.

Our review, along with the wider literature on IVR, suggests that while IVR may have limited clinical effectiveness, there are other factors that should be considered for IVR use in tobacco cessation. For patients, IVR can be an accessible tobacco cessation tool. Barriers to entry are relatively low, it can provide a private, judgement-free environment for patients to speak freely about their smoking habits, tobacco use, goals, fears and motivations and it can offer an opportunity for patients to engage in self-monitoring of their own care and progress. However, due to the automated nature of IVR, there may be a loss of the emotional support patients can receive with in-person counselling.[37] For providers, IVR can immensely reduce their workload and optimise their time and scalability while still allowing them to thoroughly care for many patients simultaneously. IVR can help providers gain regular insight into the progress of their patients and can help guide or revise treatment plans and provide additional support when needed most. However, there is required technical training, privacy concerns and implementation costs that providers should consider when thinking about using IVR for tobacco cessation. Implications on the healthcare system include important public health and population health considerations. IVR directly addresses smoking and tobacco use which continues to highly burden the healthcare system through smoking-related diseases. IVR can also assist with appropriate resource allocation and may serve as a cost-saving healthcare tool. Ultimately, though the clinical effectiveness of IVR may be low for some patients, it may still be a useful tool for patients, providers and the healthcare system for increasing smoking cessation and reducing healthcare use and costs.

While this study provides a broad overview of the current literature surrounding IVR for tobacco cessation, several limitations exist. First, the majority of included studies were of low to moderate quality. Though most studies were controlled trials, variability in interventions, methods and outcome measures prevented the possibility of a meta-analysis. This limited the extent to which the comparative effectiveness of IVR applications and uses across the different populations could be inferred. Further, due to the low number and quality of studies available for multiple populations, generalisations cannot be made, and results should be interpreted with caution.

There are also significant gaps present in the literature that should be noted. Though the literature review identified several unique populations, there were several populations that were not identified that may uniquely benefit from IVR, such as racialised groups and Indigenous Peoples, and only one study stratified by sex or gender. Therefore, little is known about how the effectiveness of IVR is affected by race, marginalisation, or sex or gender. Similarly, there were no studies that compared IVR initiated in different contexts or settings, such as inpatient versus outpatient, and very few compared rural and urban settings. The effectiveness of IVR could be impacted by the context or setting in which it is initiated as this may affect how open patients are to quitting, and different considerations or barriers associated with different settings may be required. Further, only two studies compared different IVR delivery schedules and found no difference.[21 27] Different schedules and times for follow-ups may have different effectiveness, and effectiveness may be dependent on patient needs. Finally, the literature search did not identify any qualitative studies examining patient perspectives on IVR, the usefulness of IVR and patient's responsiveness to IVR for tobacco cessation and no studies examined providers' opinions on IVR.

Conclusion

It is imperative that tobacco cessation interventions be approached with effective mitigating and preventative strategies. While the evidence base is weak, results of this review indicate that IVR appears to be a promising intervention that can be implemented in multiple healthcare settings, across multiple distinct populations. Overall, IVR was effective at increasing abstinence rates and encouraging positive health outcomes for tobacco cessation. However, several significant gaps in the literature still exist. Organisations can pilot tobacco cessation intervention programmes using IVR and contribute, using real-life contexts, to the growing knowledge base of this technology.

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Contributors MK: analysis and interpretation of data, data quality assessment, draft and editing of manuscript. AM: analysis and interpretation of data, data quality assessment, draft and editing of manuscript. NE: conceptualisation and design of work, analysis and interpretation of data, draft and editing of manuscript. BA: analysis and interpretation of data, data quality assessment. RD and KA: conceptualisation and design of work. FC: conceptualisation and design of work, study registration, critical review and editing of manuscript. All authors critically assessed, edited and approved the final manuscript. The corresponding author attests that all listed authors meet the authorship criteria and no others meeting the criteria have been omitted. FC is the guarantor.

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