Exploring the delivery of alcohol-related health advice in dental practice settings: A scoping review

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Exploring the delivery of alcohol-related health advice in dental practice settings: a scoping review

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Executive Summary

Alcohol-related harms result in significant health, social and economic costs to the Scottish population. Dental Professionals (DPs), including general dental practitioners (GDPs) and dental hygienists, are ideally placed to support public health efforts to reduce alcohol-related harm by routinely screening patients and offering alcohol-related health advice. DPs in the UK are encouraged to screen patient's alcohol consumption and provide advice in the form of alcohol brief interventions (ABIs) (Scottish Government, 2018a; Department of Health & Social Care, 2021). A literature review conducted over 10 years ago highlighted that DPs were reluctant to deliver ABIs (McAuley et al., 2011). There is a need to review more up to date evidence on this topic to understand what progress, if any, has been made regarding the delivery of ABIs and other forms of alcohol-related health advice in dental practice settings. Further, there is a gap in knowledge relating to dental patients' views on receiving such advice. Gaining this understanding would help to inform future research and policy priorities regarding the delivering of alcohol-related health advice in dental practice settings.

A scoping review was conducted to systematically explore the current evidence on the delivery of alcohol-related health advice to patients in dental practice settings. The review questions were: 1) what are the range of interventions used to deliver alcohol-related health advice in dental practice settings?; 2) what are the barriers and facilitators to the delivery of alcohol-related health advice?; and 3) what are dental patients' views on the delivery of alcohol-related health advice? A scoping review methodology was followed to identify relevant literature sources that could provide answers to the review questions. Data were extracted from included articles and presented and analysed according to the review questions.

Only 17 literature sources detailing 12 primary studies that were identified as relevant to this scoping review, demonstrating the limited evidence base on this topic. The only type of intervention used to deliver alcohol-related health advice was the ABI; this was delivered in different formats across three types of dental practice settings and had mixed impact on dental patients' alcohol consumption. Several barriers and facilitators to delivering this advice in dental practice settings were identified:

- Limited time: Delivering alcohol-related health advice placed pressure on the already limited time DPs had to spend with patients. This was generally considered to be less of an issue for dental hygienists as they tend to spend more time with patients compared to GDPs.
- Training: A lack of training on how to deliver alcohol-related health advice was linked to DPs' limited knowledge and confidence to deliver the advice. Conversely, training DPs facilitated the delivery of this advice.

- Perceptions on the roles of DPs: DPs had mixed views on their role in providing general health promotion interventions including alcohol-related health advice. Some considered this an important part of their role while others did not view this as relevant. There were also contrasting views regarding the suitability of dental hygienists delivering such advice.
- Perceived patient discomfort and non-compliance to DP's advice: Some DPs believed that discussions about alcohol would discomfort or embarrass patients, and result in disrupting important dentist-patient relationships. Some also believed that patients would not want to receive such advice from DPs, and that patients would not comply with the advice.
- Lack of funding: Insufficient funding or remuneration for delivering alcohol-related health advice and other general health promotion interventions prevented DPs from delivering such interventions.
- Lack of referral resources and follow-on care: Concern over the lack of appropriate and relevant information and limited knowledge of services to signpost/refer patients to, and the ethical and legal implications of this made some DPs reluctant to deliver alcohol-related health advice.

The review also found that patients generally were comfortable with receiving alcohol-related health advice from DPs and welcomed such advice if their drinking impacted on their oral health; this contrasts with DPs perceptions that patients would not want to receive such advice during dental visits.

Recommendations

The key recommendations presented are reflective of the findings from our data analysis and discussion. They are:

- More research in the form of robust trials is needed on the feasibility and potential effectiveness of ABIs in dental practice settings.
- More research is needed to explore the utility of innovative approaches including virtual and computer-based screening tools and programmes to provide advice to dental patients on how to reduce their alcohol consumption.
- Collaborative working with DPs, dental patients and policy makers should be encouraged to identify strategic ways to address barriers to the delivery of alcohol-related health advice in dental practice settings.
- Regular and appropriate training should be provided to DPs to boost their confidence and normalise alcohol-related health advice as part of their relationships with patients.
- More research to capture dental patients' views on the acceptability of receiving alcohol-related health advice to inform training materials and clinical guidance.
- Public awareness of the public health role of DPs in addressing alcohol-related harm should be promoted.

1.0 Introduction

Alcohol-related harms continue to result in significant health, social and economic costs across the globe. In 2022, a total of 10,048 alcohol-specific deaths were documented across United Kingdom (UK) the highest number on record (Office for National Statistics, 2024). Of that number, Scotland registered 1,276 alcohol-specific deaths, which was the highest recorded since 2012 (National Records of Scotland, 2023). Of the constituent countries within the UK, Scotland has a chronic history of higher deaths of 22.6 as age standardised rate per 100,000 compared with Northern Ireland (19.5), Wales (15.4) and England (14.5) (Office for National Statistics, 2024). Alcohol-related harms are estimated to cost the Scottish economy £5-£10 billion respectively (Bhattacharya, 2023).

Cancers, including oral cancers, are major contributors to death and disability in the UK. There is strong evidence that shows alcohol consumption is a modifiable risk factor for several cancers including oral and throat cancers (Cancer Research UK, 2022; Rehm, Sheild and Weiderpass, 2020). In 2023, 8,864 people in the UK were diagnosed with oral cancer and 3,304 people died due to the disease (Mouth Cancer Foundation, 2024). Further, the incidence of oral cancer has risen by 49% over the past 10 years (Mouth Cancer Foundation, 2024). Many general dental practitioners (GDPs) provide primary care to a large proportion to the general population (Shepherd and Ogden, 2017; Csikar, 2018) and can identify and diagnose malignant or pre-malignant lesions during oral examinations (Abadeh et al., 2019). Thus, General Dental Practitioners (GDPs) play an important role in the detection (at early and later stages) of oral and oropharyngeal cancers.

In the UK, dental professionals (DPs) (any professional who is qualified to support the provision of dental care such as GDPs, dental nurses, dental hygienists and dental therapists) are encouraged to screen patients' alcohol consumption and offer those at risk of alcohol-related harm, brief, supportive advice to reduce their alcohol consumption (Scottish Dental Clinical Effectiveness Programme, 2011; Scottish Government, 2018a; Department of Health & Social Care, 2021). The delivery of brief, structured supportive advice is known as an Alcohol Brief Intervention (ABI), and it is used by healthcare practitioners to motivate and support patients to reduce their alcohol consumption across diverse settings (including and beyond dentistry) (Scottish Government, 2018b). The World Health Organization (WHO) recommends the delivery of ABIs as a key action to help reduce higher risk alcohol consumption (WHO, 2022). In 2008, Scotland was the first country to introduce a nation-wide ABI programme, with priority given to antenatal, primary care and A&E settings, and later on, criminal justice settings (Scottish Government, 2018b). Although most of dental care provision falls under primary care, dental practice settings were not prioritised. Traditionally, GDPs in the UK have been reluctant to discuss alcohol with patients (Shepherd et al., 2010;

McAuley et al., 2011; Shepherd et al., 2011). A review published in 2011 suggested the exclusion of ABIs from the 'fee-per-item' funding model was a key deterrent to their delivery in the UK (McAuley et al., 2011), but recent NHS dental reforms in Scotland have changed the landscape, now allowing remuneration for providing alcohol-related health advice (Scottish Government, 2023).

There is a strong evidence that alcohol screening and ABIs can be effective in reducing alcohol consumption among patients in a variety of healthcare settings (Donoghue et al., 2014; Alvarez-Bueno et al., 2015; Schmidt et al., 2016; Mathur et al., 2022), however, the evidence on their effectiveness in reducing dental patients' alcohol consumption is weak. Mathur et al. (2022) undertook an overview of systematic reviews and clinical guidelines focused on assessing and preventing behavioural risk factors of oral cancer (i.e. tobacco and alcohol use) in dental practice settings; they did not find any high-quality reviews that focused on alcohol, and found only one high-quality guideline (by the Scottish Dental Clinical Effectiveness Programme) that provided recommendations for reducing alcohol consumption. However, the strength of these recommendations was rated as 'weak' as there was little research evidence to support them. Mathur et al. (2022) drew on the evidence base from medical practice settings to recommend strategies for reducing alcohol consumption among dental patients including screening alcohol consumption and providing alcohol brief advice tailored to patients' motivational status.

Given the increasing harms that alcohol causes in the UK, it is important to understand how DPs, most of whom are well-placed to deliver potentially life-saving alcohol-related health advice, can be supported to do so. This might include a range of avenues such as understanding any barriers or facilitators and DPs' views on the topic, and exploring novel ways of delivering alcohol-related health advice that have been developed for other settings, such as text-based and web-based interventions (Prosser, Gee and Jones, 2018; Bendtsen et al., 2021; Pueyo-Garrigues et al., 2024). It is also important to understand the views of dental patients regarding receiving such advice during dental visits.

Given the importance of tackling alcohol related harms and the significant knowledge gaps on this topic in dental practice settings, it is both sensible and appropriate to conduct a scoping review to map relevant evidence and provide recommendations for future research and dental practice. The aim of this scoping review was to provide a systematic synthesis of the evidence relating to the delivery of alcohol-related health advice in dental practice settings to inform future practice and research priorities.

The review questions were:

1. What are the range of interventions used to deliver alcohol-related health advice in dental practice settings?

2. What are the barriers and facilitators to dental professionals delivering alcohol-related health advice in dental practice settings?

3. What are dental patients' views on receiving alcohol-related health advice in dental practice settings?

2.0 Methods

2.1 Study design

A scoping review methodology was chosen because of its suitability for identifying and mapping available evidence on a particular topic to inform clinical practice and future research (Munn et al., 2018). The Joanna Briggs Institute (JBI) framework for undertaking a scoping review was used to ensure that a systematic approach was taken (Peters et al., 2020). The Preferred Reporting Items for Systematic Reviews and Meta-analyses Extension for Scoping Reviews (PRISMA-ScR) checklist was used to aid the transparency, auditability and trustworthiness of this process (Tricco et al., 2018).

2.2 Search strategy

An initial search of MEDLINE was undertaken to test for suitable search terms to identify literature relating to the delivery of alcohol-related health advice. The words contained in the titles and abstracts of relevant articles, and the index terms used to describe the articles were used to develop a full search strategy (Tables 5 and 6). The databases searched to identify relevant articles included CINAHL, MEDLINE, the Cochrane Library, Scopus and Web of Science. A search was also conducted using Google Scholar (papers appearing in the first three pages of search results only) to identify any additional articles or grey literature relevant to the review. The citations from reference lists of all included articles were screened to identify any additional relevant published research not previously established in the search strategy. Relevant grey literature discovered through manual searching of reference lists was included in the review. All searching was done by SS and AM and took place between July 2023 and April 2024.

2.3 Eligibility Criteria

In line with the JBI guidance, the PCC (Population, Concept, Context) framework was used to define the eligibility criteria for this review (Peters et al., 2020). The populations of interest were dental patients and all categories of DPs. The concepts of interest were: i) interventions that involved the screening of alcohol consumption or

alcohol harms, or delivery of alcohol-related health advice, and ii) subjective or objectives outcomes explaining the experiences, perceptions, attitudes and beliefs of DPs and dental patients regarding giving/receiving alcohol-related health advice respectively. The context included dental practice settings. Only literature sources written in English were included. Primary research studies published in peer-reviewed journals and elsewhere, for e.g. in reports from organisations, were included. All study designs were included and there were no geographical or date restrictions. Literature and evidence reviews were not included but their reference lists were searched to identify relevant primary research studies or grey literature. Opinion pieces, editorials and news articles were excluded.

2.4 Study selection

The study selection process followed the steps of the PRISMA-ScR flow diagram (Tricco et al., 2018). Search results were uploaded to Endnote and duplicates removed. Titles and abstracts were screened independently by AM and SS for assessment against the eligibility criteria. Any discrepancies were discussed with LM. Articles that did not meet these criteria were removed. Full text versions of remaining articles were further screened independently by AM and SS against the eligibility criteria. Those that did not meet the inclusion criteria were removed. Discrepancies were discussed and resolved with LM and DW.

2.5 Data extraction

A tailored data extraction form using Microsoft Excel was designed for this review. The data extracted included publication details, type of dental practice setting, participant characteristics, study aim and design, interventions and outcomes, barriers and facilitators of delivering alcohol-related health advice, patients' views, and other findings relevant to the review questions. Scoping reviews do not require quality assessment of included sources of evidence, hence this was not undertaken (Munn et al., 2018). 2.6 Data analysis and presentation of results The extracted data were analysed using a descriptive, narrative approach. This involved writing free text to capture the key findings, uncertainties, and learning from each source of evidence. Summarised data were presented in table form and text under main headings relating to the three review questions: 1) range of interventions; 2) barriers and facilitators of delivering alcohol-related health advice; and 3) attitudes and behaviour of patients.

2.6 Data analysis and presentation of results

The extracted data were analysed using a descriptive, narrative approach. This involved writing free text to capture the key findings, uncertainties, and learning from each source of evidence. Summarised data were presented in table form and text under main headings relating to the three review questions: 1) range of interventions,

2) barriers and facilitators of delivering alcohol-related health advice; and 3) attitudes and behaviour of patients.

3.0 Results

3.1 Search results

A breakdown of the search results and the article selection process using the PRISMA flow diagram is presented in Figure 1. A total of 159 records (all peer-reviewed articles) were identified through database screening, with an additional nine articles found through manual searching of literature reviews identified through the search. Following the removal of duplicates (n=70), the titles and abstracts of 89 articles were further screened with articles not meeting the inclusion criteria also removed (n=52). Thirty-seven articles were sent forward for full text screening. Twenty-six articles were excluded (Figure 1 details the reasons for exclusion), resulting in 11 reports being included in the review. Fourteen records were identified from the manual searching of references lists; eight were excluded for not meeting the inclusion criteria (reasons detailed in Figure 1), resulting in six reports being included in the review. In total, 17 Seventeen reports detailing records (16 peer-reviewed articles and one report) detailing 12 primary research studies were included in the final sample for this review. The results of the data analysis are presented below, and are aligned to the research questions of the review.

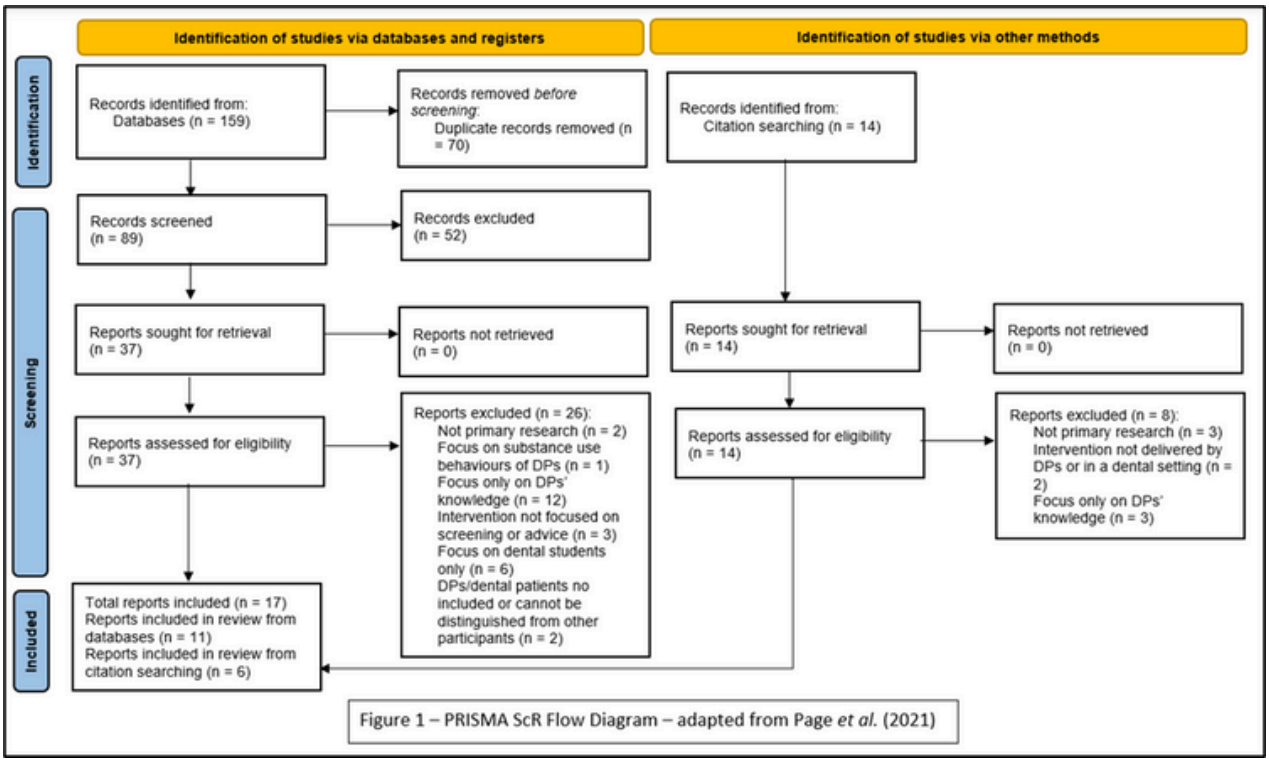

Figure 1 – PRISMA ScR Flow Diagram – adapted from Page *et al.* (2021)

3.2 Range of interventions

Three studies explored a single type of intervention, such as alcohol screening and ABI in dental settings (Table 2). Data on interventions and outcomes of these three studies were published in multiple articles/reports: Dermont et al., 2020 and Ministry of Defence, 2017 (one study); Ntouva et al., 2015, Ntouva et al., 2018 and Ntouva et al., 2019 (one study) and Neff et al., 2013 and Neff et al., 2015 (one study.) Two of these studies were conducted in the UK (Ntouva et al.; Dermont et al., 2020), while the third study was conducted in the USA (Neff et al.). Data on the interventions and outcomes of these studies were also provided in other articles/sources and were incorporated into the analysis. The geographical spread of the studies differed: Dermont et al. (2020) involved military dental centres across the UK, Ntouva et al. involved 12 dental practices across North London, UK and Neff et al. involved 13 dental practices in a region within Southeast Virginia, USA.

3.2.1 Design of studies

Dermont et al. (2020) piloted the introduction of alcohol screening and ABI to military service personnel. The study design was not specified, however, piloting of the intervention involved two stages: an initial pilot involving 319 service personnel and a follow-up pilot involving 109,459 service personnel (no control group used at either stage). Questionnaires were completed to assess outcomes pre- and post-intervention relating to the number of service personnel for whom alcohol screening and ABIs were provided, and to capture dentists' feedback. Ntouva et al. assessed the feasibility, acceptability and effectiveness of an ABI; the primary outcome measure was the change in dental patients' alcohol consumption levels. Similarly, Neff et al. also assessed the effectiveness of an ABI through measuring the change in dental patients' alcohol consumption levels. Both Ntouva et al. and Neff et al. were randomised controlled trials (RCTs) and both randomised participants with an increased risk of alcohol-related harm into intervention and control groups. Ntouva et al. also contained a qualitative element to obtain dentists and dental patients' perspectives; this was combined with a quantitative element assessing dentists' knowledge, attitudes and confidence to deliver the ABI intervention to evaluate the feasibility and acceptability of the intervention.

Table 2 – Studies involving interventions to deliver alcohol-related health advice in dental practice settings

First author, year(s); country	Setting	Study design & Aim	Participants	Intervention	Outcomes - screening	Outcomes – change in alcohol consumption
Dermont et al., 2020 (with included data from Ministry of Defence, 2017); United Kingdom	Primary Healthcare Dental Centres	Design not specified but an intervention was piloted over 2 stages (initial and follow-up pilot) **Aim:** to introduce a population-level primary care intervention to identify and support military service personnel whose drinking places them at greater risk of harm	**Initial pilot:** n = 319 service personnel; all male & white **Follow-up pilot**: n = 109,459; 74% male	**Description:** Screening using AUDIT/AUDIT-C and 3–5-minute ABI delivered by a dentist. Signposting /referral offers to alcohol support services / GP were made if needed. **Initial pilot:** Participants completed the 10-question AUDIT. Those whose scores indicated increased risk were offered the ABI. **Follow-up pilot:** Participants completed the 3-question AUDIT-C. Those who scored above 0 were given a wallet card containing information on the health implications of alcohol. Those whose scores indicated increased risk were offered the ABI.	**Initial pilot:** 39% of participants scores indicated an increased risk (compared to 7% of service personnel who would have been identified as having increased risk, prior to the intervention period). **Follow-up pilot:** 109,459 participants completed an AUDIT-C. More males had scored 5+ than females (62.9% vs. 46.2% - significant difference). 20-24 and 25-29 years olds had significantly higher than average risk for scores of 5+ (67.1% and 63.1% respectively). More white participants scored 5+ than BAME participants (64.7% vs. 25.5% - significant difference).	Not measured
Ntouva et al., 2015, 2018, 2019; United Kingdom	12 dental practices in North London	Two-arm cluster Randomized Controlled Feasibility Trial **Aim:** To assess the feasibility and acceptability of screening for alcohol misuse and delivering brief advice	n = 229; 55.5% were male; mean age 38 years; 54.8% university educated or higher	**Description:** Screening using AUDIT/ADUIT-C and up to 5-minute ABI delivered by a dentist. **Intervention group:** 119 participants received ABI and an information leaflet. Those who scored 10 or higher were given contact details of local alcohol support services. **Control group:** 110 participants were given a mouth cancer prevention leaflet.	Non-significant differences observed between groups for AUDIT scores. Intervention group observed having less participants scoring 8+ compared to the control group (44.9% vs. 59.8% respectively). Non-significant differences observed between groups for AUDIT-C scores between baseline and 6-month follow-up (-0.67 units vs -0.29 units respectively)	Intervention group observed a significant difference in number of weeks of abstinence in the past 90 days compared to the control group (3.2 vs 2.3 weeks respectively).

First author, year(s); country	Setting	Study design & Aim	Participants	Intervention	Outcomes - screening	Outcomes – change in alcohol consumption
Neff et al., 2013; 2015; United States of America	13 dental practices across the Hampton Roads area of southeast Virginia	Cluster-randomized trial **Aim**: to explore the effectiveness of a screening and ABI for heavy drinkers in dental practice.	n = 103; 64% female; 91% white; 68% college educated; mean age 40 years	**Description:** Screening using **National Institute on Alcohol Abuse and Alcoholism** (NIAAA) guide and a 3–5-minute ABI delivered by a dental hygienist. **Intervention group:** 50 participants were given a personalised feedback report based on screening scores. Dental Hygienists delivered targeted ABI during the dental visit. **Control group:** 53 participants received standard dental care involving medical history update, oral examination, dental cleaning and general oral health education.	Not measured.	After 3 and 6 months, only heavy drinkers in intervention group observed significant decrease in total drinks per week (-5.79 and -1.36 drinks respectively) compared to baseline after 3 and 6 months. After 3 and 6 months, only heavy drinkers in intervention group observed significant decrease in drinking days per week (-1.36 and -1.36 days respectively) compared to baseline. After 6 months, only heavy drinkers in intervention group observed a significant decrease in drinks per occasion (-1.53 drinks) compared to baseline.

NIAAA - National Institute on Alcohol Abuse and Alcoholism

3.2.2 Participant characteristics

A total of 110,110 participants were included across the three studies; 99% (n=109,778) of these participants were in the study by Dermont et al. (2020). Despite the overall predominate gender of participants being male, variation existed between the studies. All participants in the initial pilot in Dermont et al. (2020) were male, whereas 74% (n=98,237) of participants were male in the follow-up pilot; in Ntouva et al. 55.5% (n=127) of participants were male. In contrast, women made up two thirds (65%; n≈65 (actual number not stated)) of participants in Neff et al.

The average age of participants in Ntouva et al. and Neff et al. were similar (38 and 40 years respectively). Dermont et al. (2020) classified participants into age groups but did not specify how many participants were in each category.

Most of the participants in Neff et al. were educated to college level or higher (68%), while just over half (54.8%) of participants in Ntouva et al. were educated to this level. Dermont et al, (2020) gave no account of education attainment

Neff et al. described the ethnicity of participants, with 91% being white. Dermont et al. (2020) only provided the percentages of white and BAME participants who had an AUDIT-C score of 5+. In relation to alcohol use, Ntouva et al. and Neff et al. only included participants whose alcohol screening scores indicated that they had an increased risk of alcohol-related harm, while Dermont et al. (2020) included participants with a range of screening scores that indicated low to high risk of alcohol-related harm.

3.2.3 Screening tools

Ntouva et al. and Dermont et al. (2020) used the full 10-question AUDIT and the shorter 3-question AUDIT-C for screening alcohol consumption levels of participants. In Dermont et al. (2020), dentists initially used the full AUDIT tool, but due to dentists' feedback on how much time this took, the AUDIT was replaced by the AUDIT-C in the follow-up pilot. In Ntouva et al. the AUDIT-C was self-completed by patients while waiting for their dental appointment, but for the six-month follow-up, screening was done via telephone interviews with researchers using the full AUDIT. Neff et al. conducted phone interviews and used the National Institute on Alcohol Abuse and Alcoholism (NIAAA, 2005) guidance for either total drinks per week or binge drinking episodes in the past 30 days, to screen participants' alcohol consumption.

3.2.4 Nature and delivery of alcohol-related health advice

In all three studies, alcohol-related advice took the form of brief advice delivered by either a dentist or dental hygienist; written information on the risks or harms of

consuming alcohol was also offered to intervention participants and those with an increased risk of alcohol-related harms were signposted or referred on to receive more support (except for Neff et al.).

In their follow-up pilot, Dermont et al. (2020) gave all participants, regardless of their AUDIT-C score, a wallet card that contained information on the health implications of alcohol use. Participants who had an increased risk of alcohol-related harm received brief advice for three to five minutes by a dentist, and if needed, were signposted to alcohol support services or offered a referral to a GP. No details on a theoretical basis for the brief advice intervention were provided. The intervention group in Ntouva et al. received dentist-delivered brief advice for up to five minutes; this ABI was modified from a tool used in a previous study (Screening and Intervention Programme for Sensible drinking or SIPS study) (Kaner, 2013). Intervention participants were also given a leaflet that contained information on alcohol including associated health risks and alcohol support services. Participants with an AUDIT-C score of 10 or higher were also given contact details of local alcohol support services. The intervention participants in Neff et al. received a one-page computer-generated report that was based on the results of their screening prior to their dental visit. The contents of the report were based on the concepts of personalised normative feedback (PNF), which provided comparisons with others' drinking behaviours to help initiate behavioural change (Neff et al., 2013). At their dental visit, intervention participants received brief advice involving Motivational Interviewing (MI) techniques for three to five minutes from a dental hygienist.

3.2.5 Outcomes of interventions

Only Ntouva et al. and Neff et al. measured the changes in alcohol consumption levels of participants before and after the ABI was delivered. The only significant difference reported by Ntouva et al. related to abstinence, where the intervention group was observed to abstain from drinking 0.9 weeks longer than the control group at six months. No significant differences between the intervention and control groups were reported for alcohol consumption levels at six months. Neff et al. reported a significant difference in total drinks per week consumed (product of weekly drinking frequency and drinking quantity) for heavy drinkers in both the intervention and control groups at three months, with only the intervention group sustaining this reduced consumption at six months (compared to baseline).

Dermont et al. (2020) focused on the uptake of the alcohol screening and ABI among military service personnel. The findings from the initial pilot showed that introducing the intervention resulted in 7% more service personnel being identified as having an increased risk of alcohol-related harm compared to before, when no screening and

ABIs were conducted (personnel at risk were only previously identified through self-reporting their alcohol consumption). In the follow-up pilot that ran over one year, 109,459 participants representing (74%) of all UK military service personnel had completed AUDIT-C screening and 42,074 ABIs were recorded, with only 780 (1%) service personnel declining ABIs. Results of the follow-up pilot also showed more males than females (62.9% vs. 46.2%), more 20-24 and 25-29 years olds than other age groups (67.1% and 63.1% respectively), and a greater number of white compared to minority ethnic participants (64.7% vs. 25.5%) received an AUDIT-C score that indicated an increased risk of alcohol-related harm (5+).

Ntouva et al. was the only study that measured health-related quality of life using EQ-5D-5L but they did not find any significant difference between the intervention and control groups at six months.

3.2.6 Uptake of interventions

None of the three studies indicated how many dental practices they originally intended to recruit. Only 4% (n=12) and 3% (n=13) of dental practices invited to take part in Ntouva et al. and Neff et al. respectively were recruited. Reasons were not provided for why other invited dental practices chose not to participate. Dermont et al. (2020) described a UK-wide roll out of its intervention in its follow-up pilot but did not specify the number of military dental practices involved; the authors also indicated that there may have been a lack of engagement with the intervention from some of the dental practices.

The hierarchical command structure within the military might explain the level of UK wide implementation and high engagement whereby there is less elasticity to decline involvement.

3.3 Barriers and facilitators relating to the delivery of screening and alcohol-related health advice

Ten studies provided insights into the factors that hindered (barriers) and enabled (facilitators) DPs delivery of screening and/or alcohol-related health advice (Table 3). Three were the intervention studies described in Section 4.2 (Neff et al.; Ntouva et al.; Dermont et al. 2020); the remaining seven studies explored the views of DPs using questionnaires and/or qualitative interviews (Macpherson et al., 2003 and McCann et al., 2000 (one study); Dyer and Robinson, 2006; Shepherd et al., 2010; Shepherd et al., 2011; McNeeley et al., 2013; Yusuf et al., 2015; Staras et al., 2021).

Seven of these studies were conducted in the UK (Macpherson et al., 2003 and McCann et al., 2000 [one study]; Dyer and Robinson, 2006; Shepherd et al., 2010; Shepherd et al., 2011; Yusuf et al., 2015; Ntouva et al.; Dermont et al., 2020) while the remaining

three were conducted in the USA (Neff et al.; McNeeley et al., 2013; Yusuf et al., 2015; Staras et al., 2021). The number of DP participants in the studies ranged from 14 (Dermont et al., 2020) to 475 (Staras et al., 2021).

Table 3 – barriers and facilitators to the delivery of alcohol-related health advice in dental practice settings

First author, year(s); country	Study Design	Intervention	Barriers	Facilitators
Staras et al., 2021; USA	Quantitative study that distributed questionnaires to 475 dentists and dental hygienists in the South Atlantic region of The National Dental Practice-Based Research Network	Questions focused on dental practitioners' perceptions of their practices and barriers relating to six health-related conditions including alcohol use (note that alcohol use is not separated out from the other conditions)	Reported barriers (always, usually and occasionally) to addressing substance use: • **Time:** 74% reported lack of time • **Patient discomfort:** 72% reported concern that their patient will be uncomfortable • **Funding:** 48% reported lack of reimbursement • **Resources**: 43% reported not having referral resources	
Dermont et al., 2020; UK	Implementation study delivered across 6 military dental practices involving: 1) an initial pilot that used questionnaires to assess 14 dentists' attitudes; 2) feasibility testing of delivering training in the use of screening and ABIs; and 3) follow-up acceptability study of a 2-hour ABI course	Alcohol screening and alcohol brief advice delivered to UK military personnel. Questions focused on dentists' perceptions relating to the training programme and delivery of screening and ABIs.	• **Time**: screening using the AUDIT-C (3 questions) was preferred over the full AUDIT (10 questions), given the current heavy workload dentists had • **Patient discomfort:** fear of overloading patients with information and worry about managing patients who became resistant or aggressive when asked about their drinking habits • **Role of dentists:** view that making a primary care referral was a significant step over and above the delivery of verbal advice and concerns about the ethical and legal aspects of managing potentially dependent drinkers	• **Training:** sought to improve understanding and skills on how to deliver ABIs and reduce clinician-patient communication barriers • **Screening:** useful in helping to facilitate conversations with patients • **Stakeholder engagement:** buy-in from dentists and other stakeholders was important to the uptake of screening and ABIs in dental practices • **Information for patients:** provision of clear, written information to support delivery of verbal ABIs
Ntouva et al., 2015, 2018, 2019; UK	Mixed-methods evaluation study and feasibility RCT study delivered to 15 NHS dentists in North London. Evaluation study involved distributing questionnaires to and conducting focus groups with dentists and dental patients.	Alcohol screening and Brief Advice. Questions focused on dentists' perceptions relating to the acceptability and feasibility of the training programme and delivery of screening and ABIs.	• **Time:** intervention took time and this was a concern in busy NHS practices (except in training practices with newly qualified dentists; concern over amount of paperwork involved • **Patient discomfort**: anxiety in raising the topic of alcohol, especially with new patients	• **Training:** resulted in an overall improvement of levels of knowledge, specifically in identifying alcohol units in popular drinks and the impact of alcohol on oral health; overall increase in positive attitudes towards alcohol screening and intervention; and an overall increase in confidence of dentists in discussing the negative impact of alcohol with their patients, screening patients and providing brief advice. • **Screening:** tool was considered helpful and easy to use

First author, year(s); country	Study Design	Intervention	Barriers	Facilitators
Neff et al., 2013, 2015; USA	Developmental study that used mixed-methods to obtain the views of 164 dentists and 93 hygienists (Neff et al., 2013) and RCT study involving 13 dental practices across the Hampton Roads area of southeast Virginia	Screening and Brief Intervention (SBI)	• **Time:** dental professionals believed screening of patients' alcohol consumption would be disruptive to daily routines at the practices and affect the implementation of the intervention; dentists spent less time with patients in a routine dental visit compared to dental hygienists (12 mins vs. 40 mins respectively) • **Role of dentists:** dentists were less likely than dental hygienists to agree that dental practice provided an opportunity to screen and counsel about alcohol, and that screening and counselling was appropriate for their role	**Role of dental hygienists:** dental hygienists were less likely to be concerned about the effectiveness of screening and counselling about alcohol than dentists, and were more likely to agree that screening and counselling about alcohol was appropriate for dental practices
Yusuf et al., 2015; UK	Quantitative study that distributed questionnaires to 352 NHS GDPs in North London	Questions focused on GDP's attitudes relating to preventive practices including deliver alcohol advice (note that advice on alcohol use is not separated from advice on diet and tobacco use)	Reported barriers (strongly agreed/agreed) to delivering preventive practices: • **Funding:** 86.3% reported inadequate remuneration • **Time:** 84% reported lack of time • **Patient compliance:** 66% reported poor patient compliance • **Patient discomfort:** 21.1% reported likely to alienate patients • **Motivation**: 13% reported lack of motivation • **Training:** 11.9% reported lack of training • **Knowledge:** 3.8% reported lack of knowledge • **Confidence:** 3.1% reported lack of confidence	
McNeely et al., 2013; USA	Quantitative study that distributed questionnaires to 143 dentists from the Practitioners Engaged in Applied Research and Learning network	Questions focused on dentists' attitudes towards addressing alcohol, illicit drug and tobaccos use (note alcohol use is separated from tobacco and illicit drug use)	Reported barriers to addressing alcohol use: • **Training:** 81% reported lack of knowledge/training • **Resources:** 38% reported a lack of referral resources • **Role of dentists:** ~35% reported staff resistance to addressing alcohol use; ~ 25% reported that dental practices were not effective in helping patients stop using alcohol; ~ 18% reported that dental practices were not appropriate settings to address alcohol use • **Time:** ~25% of reported lack of time	

First author, year(s); country	Study Design	Intervention	Barriers	Facilitators
Shepherd et al., 2011; UK	Quantitative study that distributed questionnaires to 175 GDPs in the North Highland region of Scotland	Questions focused on GDPs' attitudes and practices relating to providing alcohol-related health advice	Patient discomfort: belief that provide alcohol advice was likely to cause embarrassment was a predictor of intention to provide advice	Predictors of intention to provide advice: • **Beliefs of alcohol related-health advice:** belief that providing advice was both practical and beneficial • **Confidence:** confidence in providing advice • **Peer-pressure:** pressure from colleagues and motivation to provide advice
Shepherd et al., 2010; UK	Qualitative study that conducted semi-structured interviews with 12 GDPs in the North Highland region of Scotland	Questions focused on GDPs' practices and barriers relating to providing alcohol-related health advice	**Training:** belief that dentists were not qualified or confident to deliver advice to patients **Patient discomfort:** belief that delivering advice would disrupt the patient-clinician relationship through embarrassment, causing offence and adverse patient behaviour **Role of dentists:** perceived relevance of delivering advice to the practice of dentistry by either the GDP or the patient **Resources:** Lack of management pathways for patients **Patient compliance:** belief that that providing advice would not change patient behaviour	**Clinical signs:** belief that the presence of oral lesions provided a positive clinical indication to start conversations around alcohol use **Role of dentists:** belief that wider awareness and endorsement of dentists' role in addressing alcohol use should be promoted among dentists and patients, including through patient education, media campaigns, education/training for dentists **Funding:** remuneration for delivering alcohol-related health advice

First author, year(s); country	Study Design	Intervention	Barriers	Facilitators
Dyer and Robinson 2006; UK	Mixed-methods study that conduct semi-structured interviews with principal dentists and distributed questionnaires to 167 principal dentists (87.9% were male) from 10 NHS and private practices dental in South Yorkshire	Questions focused on delivery of general health promotion to patients, including advice on patients' alcohol consumption (note that advice on alcohol consumption was not always separated out in qualitative results, but barriers to delivering of advice on alcohol consumption was separated out in the quantitative results)	• **Role of dentists**: belief that dentists who had a traditional biomedical viewpoint of health and disease did not focus on health promotion; a belief that certain Professionals Complementary to Dentistry (PCDs) such as dental hygienists did not have a role in providing health promotion • **Training:** belief that principal dentists were not adequately trained, particularly around communicating with patients, to deliver promotion interventions; 27.7% and 10.2% of principal dentists reported lack of knowledge/training for dentists and PCDs respectively was a barrier to delivering advice on alcohol consumption • **Patient discomfort:** belief that patients who are nervous or view discussion of general health as their own business would be seek out another dental practice; 36.7% and 29.5% of principal dentists reported concern that dentists and PCDs respectively would alienate patients if they were to give advice on alcohol consumption • **Patient compliance:** belief that patients would not modify behaviours due to some promotion interventions failing to do so in the past; 41.6% and 28.9% of principal dentists reported that advice on alcohol consumption from dentists and PCDs respectively would be ineffective in changing patient behaviour • **Funding:** the fee-per-item payment discouraged dentists from undertaking promotion work for which they could not claim a fee; 68.1% and 65.7% of principal dentists reported there was insufficient funding for dentists and PCDs respectively to deliver advice on alcohol consumption • **Time:** belief that delivering promotion interventions would take more time and add to workloads; 49.4% and 23.5% of principal dentists reported that providing advice on alcohol consumption was a poor use of dentists and PCDs' time respectively	**Role of dentists:** dentists who were health-focused tended to emphasise health promotion and believed patients would listen to and respect their advice
Macpherson et al., 2003; UK; McCann et al., 2000; UK	Mixed-methods study that distributed questionnaires to 152 GDPs and 73 community dental officers (McCann et al. and Macpherson et al.) and conducted semi-structured interviews with 11 GPs, 10 GDPs, 6 community dental officers, 3 dental hygienists and 3 community pharmacists (Macpherson et al. only) in Scotland	Questions focused on preventative practices relation to oral cancer, including knowledge of alcohol as a risk factor or oral cancer and asking patients about their alcohol consumption (note that results for GDPs and other dental professionals and on alcohol versus other risk factors not always separated out in results)	**Training:** less dentists reported receiving training in alcohol counselling compared to medical professionals (1% vs 32%); 61% of dental practitioners responded that they would like further training on providing alcohol consumption advice, particularly in relation to referral routes for patients to receive counselling; 10% of dental practitioners reported to be very confident in delivering advice on alcohol consumption; 42.7% reported not being confident in offering alcohol counselling in relation to oral cancer **Patient discomfort:** some dentists believed that asking patients about their alcohol use would be "bad PR" or "offensive to patients", or was "not their business"	

3.3.1 Time pressures

The limited time that DPs had to see patients was perceived as an important barrier to delivering alcohol-related health advice (Dyer and Robinson, 2006; McNeely et al., 2013; Yusuf et al., 2015; Neff et al.; Ntouva et al.; Dermont et al., 2020; Staras et al., 2021). Concern was expressed that delivering this advice and other preventive interventions competed with other priorities within the daily routine of dental practice:

> *"I would worry about the workload that we already have, I mean where would you find the time to do it?"* (Dyer and Robinson, 2006, p.48)

For Dermont et al. (2020), limited time was the main deciding factor for replacing the full-AUDIT with the shorter AUDIT-C after the initial pilot. Interestingly, time for delivering alcohol-related health advice was perceived as more of an issue for dentists, and less of an issue for other DPs such as dental hygienists. Dyer and Robinson (2006) reported that 49.4% of principal dentists believed providing this advice was a poor use of dentists' time, while only 23.5% believed it was a poor use of other DPs' time. Neff et al. reported that feedback from both dentists and dental hygienists indicated that dental hygienists spent more time with patients than dentists during routine dental visits (40 minutes on average for dental hygienists, versus 12 minutes for dentists), providing a rationale for the delivery of ABIs to be part of the dental hygienist role.

3.3.2 Training

Training of DPs was viewed both as a barrier and facilitator for the delivery of alcohol-related health advice (Macpherson et al., 2003 and McCann et al., 2000; Dyer and Robinson, 2006; Shepherd et al., 2010; McNeely et al., 2013; Yusuf et al., 2015; Ntouva et al. Dermont et al., 2020). The lack of training on how to deliver this advice was linked to limited knowledge on how to enact in practice, and limited confidence and motivation to do so. One study found that dentists were less likely to report being offered this training compared to medical doctors (Macpherson et al., 2003 and McCann et al., 2000). Studies showed that there was a strong desire from DPs to receive more training. Where training was offered by individuals or organisations with experience of delivering ABI training programmes, this was thought to improve dentists' abilities and confidence to deliver alcohol brief advice, promote positive attitudes towards providing alcohol screening and improve dentists' communication with their patients (Ntouva et al.; Dermont et al., 2020).

3.3.3 The perceived role of DPs

The perceived role of DPs in providing general health promotion was both a barrier and facilitator to the delivery of alcohol-related health advice. (Dyer and Robinson, 2006;

Shepherd et al., 2010; Shepherd et al., 2011; Neff et al., 2015; McNeely et al., 2015; Dermont et al., 2020). Some DPs believed that providing general health promotion such as alcohol-related health advice was not relevant to dental practice and questioned whether patients would appreciate and act on this advice if provided in a dental setting:

> *"Patients feel they are being criticised, they get embarrassed, leading to antagonising behaviour and non-compliance with treatment plans."* (Shepherd et al., 2010, p.3)

Conversely, there were some who believed that DPs had a role in promoting general health, that discussing alcohol use would be beneficial to patients, and patients would listen to and respect DPs' advice (Shepherd et al., 2010; Dyer and Robinson, 2006):

> *"Patients come and listen to us, they come regularly, they respect us and I think any advice we give them, they listen to us."* (Dyer and Robinson, 2006, p.47)

Dyer and Robinson (2006) suggested that the practice of providing general health promotion was linked to whether DPs were more "disease-focused", i.e. had a biomedical perspective of health, or more "health focused" with a holistic view where prevention was better than cure. The importance of enthusiastic leadership, positive peer-pressure from other colleagues, positive beliefs that providing advice was beneficial and teamwork were identified as enablers to promoting a culture of health promotion and delivering alcohol-related health advice within practices (Dyer and Robinson, 2006; Shepherd et al., 2011).

Despite acknowledgement that dental hygienists may have more time to incorporate ABIs into their practice, the literature did not agree on whether they should. Neff et al. found that compared to dentists, dental hygienists were more likely to agree that screening and counselling about alcohol was appropriate for dental practices. Dyer and Robinson (2006) reported that some dentists were keen to hand over preventative work to dental hygienists, but other dentists thought that such work may be beyond the expertise of dental hygienists:

> *"If it requires medical background knowledge then the hygienists shouldn't be doing it anyway."* (Dyer and Robinson, 2006, p.48)

3.3.4 Perceived patient discomfort and patient non-compliance to DP's advice

Perceived patient discomfort was a widely reported barrier to the delivery of alcohol-related health-advice (Macpherson et al., 2003 and McCann et al., 2000; Dyer and Robinson, 2006; Shepherd et al., 2010; Shepherd et al., 2011; Yusuf et al., 2015;

Ntouva et al.; Dermont et al., 2020; Staras et al., 2021). There was significant concern among DPs that enquiries about patients' alcohol consumption would be difficult, and could offend or alienate patients, or cause patients to become aggressive. The perceived sensitive nature of the topic and apprehensions over the appropriateness of dental settings for these discussions fuelled fears that DPs would appear intrusive and prying, and could ultimately damage patient-clinician relationships (Macpherson et al., 2003 and McCann et al., 2000; Dyer and Robinson, 2006; Shepherd et al., 2010):

"If patients are really nervous will they really want to talk about how many [alcoholic] drinks they had last night? – I think it would be really difficult." (Dyer and Robinson, 2006, p.47)

"Embarrassing patients. It would interfere with the relationship (dentist-patient). It is a privacy issue." (Shepherd et al., 2010, p.3)

For some DPs, this worry about the patient-clinician relationship was linked to worries about funding (this is further explained in Section 3.3.5).

Perceived lack of benefit and patient willingness to comply with alcohol-related health advice or other general health promotion interventions was another barrier (Dyer and Robinson, 2006; Shepherd et al., 2010; Yusuf et al., 2015). Some DPs believed that providing these interventions were unlikely to lead to meaningful behaviour change among patients, having witnessed initiatives in their practice fail in the past (Dyer and Robinson, 2006):

"So many initiatives on CHD (coronary heart disease) in the past have failed because they have not motivated people to change their behaviour." (Dyer and Robinson, 2006, p.48)

Perceived lack of benefit and patient willingness to comply with alcohol-related health advice or other general health promotion interventions was another barrier (Dyer and Robinson, 2006; Shepherd et al., 2010; Yusuf et al., 2015). Some DPs believed that providing these interventions were unlikely to lead to meaningful behaviour change among patients, having witnessed initiatives in their practice, such as coronary heart disease prevention, fail in the past (Dyer and Robinson, 2006). A pessimistic mindset about patient benefit, poor attitudes towards combined with low intention to provide alcohol advice fed a reluctance to engage or try.

3.3.5 Lack of funding

Remuneration for preventative care was highlighted as a barrier (Dyer and Robinson, 2006; Yusuf et al., 2015; Staras et al., 2021) and potential facilitator (Shepherd et al., 2010). This fact was of particular concern in UK studies where a "fee-per-item"

payment system was in place, in which health promotion work such as the provision of alcohol-related health advice, was non-reimbursable and non-profitable did not attract any remuneration (Yusuf et al., 2015; Shepherd et al., 2010; Dyer and Robinson, 2006). Shepherd et al. (2010) highlighted the business concerns that the DPs had about the potentially adverse financial impact of sensitive conversations with the perceived patient discomfort from providing alcohol-related health advice:

"There is an economic relationship ... a business. It promotes antagonistic behaviour. It is service specific, hospital dentists and salaried might afford to ask, but private practitioners ... there's an economic relationship." (Shepherd et al., 2010, p.3)

3.3.6 Lack of referral resources and follow-on care

Lack of referral resources and concerns about follow-on care was another barrier (Dyer and Robinson, 2006; Shepherd et al., 2010; McNeely et al., 2013; Dermont et al., 2020; Staras et al., 2021). DPs identified that there was often a lack of clear referral pathways or lack of integration with other health services, once problematic alcohol use had been identified. DP participants in the study by Dermont et al. (2020) also viewed the practice of making referrals as a significant further step beyond providing alcohol-related advice and expressed concerns about the ethical and legal aspects of managing patients with more serious alcohol problems.

3.3.7 Other factors

Alcohol screening was a perceived as both a barrier and a facilitator to enabling dentists to have conversations with patients about alcohol (Ntouva et al.; Dermont et al., 2020). Some DPs thought screening took too much time and increased their administrative and time burden (Dermont et al., 2020). However, the three-question AUDIT-C was considered helpful in screening patients' alcohol consumption, easy to use, supported increased patient awareness of the risks of heavy drinking, and facilitated DPs to advise patients about 'drinking sensibly' (Ntouva et al.; Dermont et al., 2020).

The presence of oral soft tissue abnormality was also thought to provide a window of opportunity for dentists to have alcohol-related conversations with patients under the umbrella of oral cancer risk factor awareness (Shepherd et al., 2010).

3.4 Patients' attitudes and behaviours

Three studies explored the attitudes and behaviours of patients in receiving alcohol-related health advice in dental settings (Miller et al., 2006; Ntouva et al., 2019; Guo et al., 2022) (Table 4). Two of these studies were based in the USA (Miller et al., 2006; Guo et al., 2022) while the other was based in the UK (Ntouva et al., 2019).

The number of participants in the studies were 14 (Ntouva et al., 2019), 408 (Miller et al., 2006) and 857 (Guo et al., 2022). Only Miller et al. (2006) and Guo et al. (2022) reported participant characteristics. The average age of participants was 43 and 51.7 years respectively. Most participants were female (59% (n=240) and 61% (n=518) respectively) and white (59% (n=240) and 56% (n=474) respectively). Fifty-five percent of the participants in Miller et al. (2006) were educated to high school level or less (n=224), while in contrast, most of the participants (82% (n=695)) in Guo et al. (2022) were educated to higher than high school level.

Table 4 – patients views on receiving alcohol-related health advice in dental practice settings

First author, Year(s); Country	Study Design	Questionnaire focus	Participants characteristics	Results
Guo et al., 2022; USA	Quantitative study that distributed questionnaires to 857 patients who participated in a Health Risk Assessment (HRA) intervention study from dental practices in the South Atlantic Region of The National Dental Practice-Based Research Network	Questions focused on patients' perceptions of their comfort in discussing six risk factors with either a dentist or dental hygienist (note alcohol use not always separated from other risk factors in the results)	**Average age:** 51.7 years **Gender:** 61% female; 39% male **Ethnicity:** 56% non-Hispanic white; 9% non-Hispanic black; 11% Hispanic; 22% other **Education:** 82% more than high school; 18% high school or less **Dental insurance:** 67% insured; 28% uninsured; 1% others; 4% unknown	• 4% of participants reported not feeling comfortable to discuss health risk factors with their dentist • 64% of participants confirmed they were comfortable discussing their alcohol use with their dentist • 21% of participants reported being asked about their alcohol use with their dentist Significant differences in comfort with receiving HRA for 3 or more r\isk factors across participant characteristics: • **Age:** older participants were more likely to be comfortable than younger participants • **Gender:** female participants were less likely to comfortable than male participants • **Ethnicity**: non-Hispanic black participants were more likely to be comfortable compared to other ethnicities • **Location of dental practice:** participants who attended suburban dental practices were more likely to be comfortable compare to participants from other practices
Ntouva et al., 2019; UK	Mixed-methods evaluation study and feasibility RCT study delivered to 15 NHS dentists in North London. Telephone interviews were conducted with 7 patients from the intervention group and 7 patients from the control group	Questions focused on the acceptability and feasibility of the intervention (Alcohol screening and Brief Advice)	No characteristics of participants who were interviewed given	Participants in the intervention group: • All felt comfortable with the way dentists introduced the topic of alcohol • All thought advice given was helpful • 6 (86%) felt advice was tailored to their needs • All thought it was appropriate for dentists to give advice on alcohol • 3 (43%) reported the advice made a difference to the way their were drinking

First author, Year(s); Country	Study Design	Questionnaire focus	Participants characteristics	Results
Miller et al., 2006; USA	Quantitative study that distributed questionnaires to a convenience sample of 408 patients attending an emergency walk-in dental clinic in South Carolina	Questions focused on participants' opinions of alcohol screening and screening for alcohol consumption (AUDIT-C)	**Age:** 43 years **Gender:** 59% female; 41% male **Ethnicity:** 59% White; 35% African-American; 6% other **Education:** 56% high school or less; 44% college or more	• 80% agreed dentists should feel free to ask how much alcohol they consumed • 75% disagreed that they would be embarrassed if their dentist asked about their alcohol use • 90% agreed their dentist should provide advice on how to cut down alcohol use if it was affecting their oral health; 90% agreed that if alcohol was affecting their oral health dentists should provide advice on how to stop drinking • 72% agreed dentists should offer a blood test that could assess if drinking was affecting their health; 60% agreed that if a dentist thought patients' drinking was affecting their health, they should feel free to order a blood test to see if they were consuming too much • 95% agreed that if asked about their alcohol use they would answer honestly; 80% disagreed with the statement "if my dentist asked me how much alcohol I drinking, I would probably not give an honest answer" • 70% disagreed that alcohol consumption was personal and confidential, and dentists should not ask about it; 75% disagreed they would be annoyed if their dentist asked them how much alcohol they consumed

Guo et al. (2022) and Miller et al. (2006) focused exclusively on patient outcomes and perceptions of ABIs, whilst Ntouva et al. (2019) focused primarily on staff perceptions and ABI outcomes, with only a brief discussion of patient perceptions. Guo et al. (2022) and Ntouva et al. (2019) asked patients about their experiences following receipt of an ABI at the dental practice (although just 21% of patients reported being asked about alcohol during their appointment in Guo et al. (2022)). Miller et al. (2006) surveyed patients about their opinions of potentially receiving alcohol-related health advice by the dentist prior to attending the dentist.

Overall, receiving alcohol-related health advice in dental practice was felt to be acceptable to patients (Miller et al., 2006; Ntouva et al., 2019; Guo et al., 2022). Levels of comfort in receiving this advice ranged from 64% reporting feeling comfortable (Guo et al., 2022), to more than 80% agreeing with the statement "If my dentist thinks my drinking is affecting my oral health, he or she should feel free to order a blood test to see if I'm drinking too much" (Miller et al., 2006). Ntouva et al. (2019) included seven interviews with patients who received the ABI intervention about their experiences and reported that all patients felt comfortable with the way the dentist introduced the issue of alcohol. In addition, 75% of patients disagreed with the statement "I would be embarrassed if my dentist asked me how much alcohol I drink", with a further 75% disagreeing with the statement "I would be annoyed if my dentist asked me how much alcohol I drink", (Miller et al., 2006). More than 90% patients reported that they would answer honestly when asked by their dentist about alcohol consumption (Miller et al., 2006).

Miller et al. (2006) explored whether characteristics such as age, sex and alcohol consumption affected patient perceptions of receiving alcohol-related health advice from dentists. They found that overall, age, sex and level of alcohol consumption were not predictive of positive or negative attitudes towards receiving alcohol-related advice. There was one exception to this, in agreement with the statement "… he or she should feel free to order a blood test to see if I'm drinking too much", whereby younger patients, and those with lower alcohol consumption were significantly less likely to agree with this statement (Miller et al., 2006).

Only Ntouva et al. (2019) reported on the helpfulness of alcohol-related health advice received in dental practice. All patients indicated that the advice provided was helpful, and six out of seven (86%) reported that the advice was tailored to their particular needs. Three patients (43%) reported that the advice made a difference to the way they were drinking (Ntouva et al., 2019).

4.0 Discussion

4.1 Summary

This scoping review aimed to explore published evidence on the delivery of alcohol-related health advice in dental practice settings. To the authors' knowledge, this is the first scoping review to systematically gather evidence on this topic. Our three review questions were: 1) what are the range of interventions used to deliver alcohol-related health advice in dental practice settings?; 2) what are the barriers and facilitators to dental professionals delivering alcohol-related health advice in dental practice settings?; and 3) what are dental patients' views on receiving alcohol-related health advice in dental practice settings? Only 17 records (16 peer-reviewed articles and one report) detailing 12 studies were identified as relevant to this review, highlighting the limited research and evidence on this topic. The discussion below is aligned to out three review questions and incorporate a range of recommendations for future research and dental practice.

4.2 Delivery of alcohol-related health advice in dental practice settings

Only three studies (Neff et al., 2015; Ntouva et al. 2019; Dermont et al., 2017) explored interventions in which alcohol-related health advice in the form of ABIs was delivered, demonstrating the limited evidence on ABIs in dental practice settings. Given that only two RCT studies (Neff et al., 2015; Ntouva et al. 2019) measured the change in participants' alcohol consumption after delivering ABIs and that mixed results were reported, it is not possible to comment on whether ABIs in dental practice settings have the potential to reduce patients' alcohol consumption.

Our review highlights many uncertainties regarding the acceptability, implementation and scalability of ABIs in dental practice. Barriers to delivering the ABIs included lack of time, perceived patient discomfort and perceptions of the role of DPs in delivering ABIs (discussed in Section 4.3) were reported to impact on the uptake of ABIs in the recruited dental practices in the intervention studies (Neff et al., 2015; Ntouva et al. 2019; Dermont et al., 2017). Further, out of all the dental practices invited to take part in the studies by Neff et al., (2015) and Ntouva et al. (2019), only 3% (n = 13) and 4% (n – 12) participated respectively. Only the study by Dermont et al. (2020) involved the rollout of an ABI in dental practice settings on a large scale, however, the substantive number of participants who had completed alcohol screening, received written information about alcohol harm and brief advice may be due to the unique context of the military service. Dermont et al. (2020) discussed that there was "Chain of Command" acceptance in which the leads of dental teams bought in to the intervention, leading to acceptance by wider dental teams. However, even with this "Chain of Command" acceptance, there were still some areas in which local leadership was not engaged (Dermont et al., 2020).

Despite the uncertainties highlighted above, our review has revealed two important points for future research within dental practice settings. First, these studies have shown that alcohol screening either before or during a dental visit can help to identify patients with an increased risk of alcohol-related harm. Second, the studies have shown that it is possible to deliver ABIs in dental practice despite several challenges (discussed in Section 4.3). The available evidence suggests that ABIs are effective in reducing alcohol consumption in other primary care settings, specifically, general medical practice (Mathur et al., 2022). There is also emerging evidence on the acceptability of delivering ABIs in a broader spectrum of settings such as prisons (Holloway et al., 2019; Newbury-Brich et al., 2018) and community-based youth work settings (Stead et al., 2017), demonstrating that ABIs can be tailored to specific contexts. Thus, more research is needed to explore how ABIs might be modified and contextualised to be acceptable to the spectrum of dental practice settings. Included in this should be a focus on the different modes of delivery for ABIs, including text-based and web-based interventions (Prosser, Gee and Jones, 2018; Bendtsen et al., 2021; Pueyo-Garrigues et al., 2024).

4.3 Barriers and facilitators influencing the delivery of alcohol-related health advice in dental practice settings

Our review identified several barriers and facilitators to DPs delivering alcohol-related health advice including time pressures, training, the role of DPs in providing health promotion interventions, perceived patient discomfort and patient non-compliance to DPs' advice and referral resources and follow-on patient care. Many of these barriers were also identified in a literature review conducted over 10 years ago (McAuley et al. 2011), demonstrating the limited progress made in addressing these barriers.

The biggest reported barrier was the issue of limited time (Dyer and Robinson, 2006; McNeely et al., 2013; Yusuf et al., 2015; Neff et al.; Ntouva et al.; Dermont et al., 2020; Staras et al., 2021). Specifically, DPs and in particular dentists, were concerned that delivering this advice would take away from the already limited time with their patients, and that alcohol screening and delivery of advice would add to their workload. Similarly, limited time is also a reported barrier for GPs delivering ABIs in primary care settings (Holloway and Donaghy, 2017; Bareham et al., 2021; Rosario et al., 2021).

One way in which limited time has been addressed in some general practices is by providing dedicated time for GPs to provide health checks to patients, which created space for discussions about patients' alcohol consumption (Bareham et al., 2021). For this to apply to the dental practice settings, considerations should be given to which other DPs beyond dentists can have dedicate time to have such discussions with patients. One of the intervention studies included in our review reported that time was less of a concern for dental hygienists (Neff et al.). Though another study in our review revealed differences in opinions regarding dental hygienists' role (Dyer and Robinson,

2006), there are compelling reasons for why dental hygienists may be appropriate to deliver this intervention. In the UK, dental hygienists have more time to spend with patients; they are trained to discuss risk factors affecting patients' oral health and offer advice on how to reduce these factors (Steeples, 2024). Thus, using dental hygienists and other DPs such as dental therapists and dental nurses to deliver alcohol-related health advice may help to reduce the time pressures faced by dentists, and improve dental patient care.

Innovative approaches to screening patients' alcohol consumption and delivering appropriate advice may also help to address the barrier of limited time. Innovations such as digital and computer-based screening tools and programmes have been used with primary care patients, college students and pregnant women (Nair et al., 2015; Ondersma et al. 2015; Ghosh et al., 2023; Pueyo-Garrigues et al., 2024). Future research should focus on their utility in the dental settings or with dental patients.

A lack of training was another main barrier identified in our review (Macpherson et al., 2003 and McCann et al., 2000; Dyer and Robinson, 2006; Shepherd et al., 2010; McNeely et al., 2013; Yusuf et al., 2015; Ntouva et al. Dermont et al., 2020). DPs often reported that a lack of training was the reason for their limited knowledge, skills and lack of confidence on how to discuss alcohol consumption with their patients. Similarly, a lack of training is a reported barrier for GPs and nurses in primary care settings (Rosario et al., 2021). This barrier can be addressed by ensuring healthcare professionals like DPs have access to regular, up to date, tailored training on how to deliver alcohol-related health advice to patients – this was reported as being helpful to GPs and responsible for developing motivation and enthusiasm among GPs in a Scottish study that explored the attitudes and practices of GPs on the delivery of ABIs in Scotland (Holloway and Donaghy, 2017). The three interventions studies included in our review detailed how the introduction of tailored programmes delivered by trained individuals boosted DPs' knowledge and confidence on how to deliver advice, thereby facilitating the delivery of ABIs (Neff et al.; Ntouva et al.; Dermont et al., 2020). As dental practices are often faced with time pressures, staff may not have time to engage with intensive training programmes. Practices should therefore investigate other modes of delivery for training such online Continuing Professional Development (CPD) accredited modules on delivering alcohol-related health advice that is developed specifically for DPs. In the UK, General Dental Council (GDC) registrants are required to undergo regular and evidenced CPD courses, so this might be one avenue to secure training.

Providing training may also help to address some of the other identified barriers in our review, namely, the uncertainty of the role of DPs in providing health promotion interventions beyond oral health and perceptions that discussing alcohol consumption

would lead to patient discomfort. Regarding the role of DPs, the training should embed the importance of DPs' role in oral and general health promotion, to help increase their intentions to deliver the intervention (Shepherd et al., 2011). Appropriate training should also enable DPs to understand how to start discussions about alcohol in a manner less likely to offend or embarrass patients.

Lack of funding for preventative interventions including alcohol-related health advice was another main barrier identified in our review (Dyer and Robinson, 2006; Shepherd et al., 2010; Yusuf et al., 2015; Staras et al., 2021). This may suggest that providing or increasing funding for dental practices may encourage them to deliver alcohol-related health advice. While increasing funding has proven beneficial to facilitating the delivery of ABIs, other barriers need to be addressed alongside this (Fitzgerald et al., 2015; Holloway and Donaghy, 2017). A study that explored the large-scale implementation of ABIs in non-primary care settings in Scotland revealed that although there was substantive funding for the ABI programme, several factors including a lack of support from senior staff and a need for flexibility to adapt the ABIs to different contexts, challenged the full rollout of the programme (Fitzgerald et al., 2015). Another study that explored the practices and attitudes of GPs regarding the delivery of ABIs in Scotland found that while having a payment system for each ABI delivered by a GP facilitated the delivery of ABIs, other factors including poor IT infrastructure and insufficient time to spend with patients challenged the delivery of ABIs (Holloway and Donaghy, 2017). Therefore, while increasing funding for the delivery of alcohol-related health advice in dental practices is welcomed (see Section 4.7), other barriers highlighted in this review need to be addressed in a strategic manner to support dental practices to deliver this advice.

Another barrier identified in our review was the lack of referral resources and follow-on care for dental patients who are identified as having an increased risk of alcohol-related harm (Dyer and Robinson, 2006; Shepherd et al., 2010; McNeely et al., 2013; Dermont et al., 2020; Staras et al., 2021). Some DPs expressed concern over not being able to provide appropriate information or not knowing where to signpost/refer patients, and the ethical and legal implications of this. This concern is understandable. For example, in Scotland, there are a range of alcohol support services that are linked to NHS Boards or local councils, or that operate privately, which target different population groups. Keeping track of these services and providing relevant information, as well as working more closely with local and specialist alcohol support services can add to the time pressures faced by dental practices. However, such efforts can be beneficial to improving dental patient outcomes and therefore consideration should be given on how to this can be strategically achieved (Holloway and Donaghy, 2017). There is also currently a lack of evidence from medical practice settings on the effectiveness of signposting versus formal referrals to specialist services for ensuring patients attended or were followed up (Mathur et al., 2022). More research is needed to understand the impact of various referral pathways for dental patients.

4.4 Patients' views on receiving alcohol-related health advice in dental practice settings

A main finding of our review was that overall, there was a contrast between DP's and patients' views on the patients' acceptability to receive alcohol-related health advice from DPs. Even though we only identified three studies that focused on dental patients' views (Miller et al., 2006; Ntouva et al., 2019; Guo et al., 2022), their findings were consistent in showing that most patients reported feeling comfortable receiving alcohol-related health advice. Miller et al. (2006) also reported that most patients agreed DPs should provide advice if their drinking was affecting their oral health. This finding of patients' acceptability to receiving alcohol-related health advice differs slightly to the evidence from medical care settings, which shows mixed patient views on the acceptability of such advice from different healthcare practitioners (Groves et al., 2010; O'Donnell et al., 2020).

Given the very limited number of studies that focused on dental patient views, more research is needed to understand dental patients' knowledge and beliefs regarding alcohol as a risk factor for oral cancer and poor oral health, and the role of DPs in providing alcohol-related health advice and other general health promotion initiatives. Such evidence could inform clinical guidance on the delivery of such interventions in dental practice settings and may be useful to changing DPs' perceptions of discomforting patients.

4.5 Strengths and Limitations of the scoping review

A strength of this scoping review is that has utilised a robust scoping review methodology to inform the answers to three clearly defined review questions (Peters et al., 2020). The review was conducted by an interdisciplinary team which allowed for the analysis and interpretation of findings to be informed by dental, nursing and public health expertise. The review included qualitative, quantitative and mixed methods studies to ensure that a broad scope of evidence was captured in relation to the delivery of alcohol-related health advice in dental practice settings. A limitation of our review is that, as per the guidance of conducting a scoping review, we did not undertake a quality assessment of the included studies therefore we were unable to comment on the trustworthiness of their findings. Additionally, our findings were based on a small number of studies meaning that it is not possible to generalise our findings to the whole population of dental patients and DPs.

4.6 Limitations and gaps in the evidence

Our review highlights limited available evidence on the delivery of alcohol-related

health advice in dental settings. The relative lack of evidence on this important topic makes a strong case for further relevant research. Additional exploration is needed to understand how best to deliver alcohol screening and advice within a diverse range of dental practice settings. Included in this should be considerations for the role of other DPs beyond dentists, the unique DP-patient relationships and innovative ways to address the other barriers identified in this review.

The studies in our review were either conducted in the UK or the USA, and therefore future research should also focus on dental practice settings in other countries, including those in low- and middle-income countries. With regards to patients, the intervention studies involved mostly men and heavy drinkers; in contrast, the studies that explored participants' views involved mostly women. There is a need to understand the views of men on the acceptability of DPs delivering alcohol-related health advice given that more men are likely to have an increased risk of alcohol-related harm than women (WHO, 2024). There is also a need to understand how women respond to receiving ABIs in comparison to men. Further, most of the participants across the studies were of white ethnicity, thus there is a gap in the evidence regarding the views and experiences of minority ethnic populations in relation to DPs delivery of alcohol-related advice. Future research should also explore the views and experiences of populations from low socio-economic backgrounds as they were under-represented in the studies in this review.

4.7 Implications for Scotland

In Scotland, DPs are regarded as integral to the government's strategy to reduce alcohol-related harm (Scottish Government, 2018a). In November 2023, the Scottish Dental Contract was updated to allow for dental practices to be reimbursed for providing alcohol-related health advice (and other general health promotion interventions) (Scottish Government, 2023). However, the wording of the contract, i.e. "Enhanced preventive care, advice, and treatment ... may also include, where appropriate" (Scottish Government, 2023, p.7) suggests that it is up to individual DPs to decide on whether to provide this advice or not. As our review has shown, several factors, including limited time and DPs' perceptions influence decisions to provide alcohol advice. Our review has also discussed how funding alone does not lead to DPs delivering this advice. A concerted effort is needed to provide appropriate training for DPs, and to work with DPs to address knowledge, attitudes and behaviours in order for them to be more confident in taking an active role regarding reducing alcohol-related harm. Additionally, more research in Scotland is needed to inform guidance for DPs to provide alcohol-related health advice to patients. Finally, at the time of publication, Public Health Scotland is due shortly to publish a review of Scotland's ABI Strategy, so any new direction for ABIs in Scotland resulting from this should include the DPs role in providing interventions, and reflect the findings of this scoping review. .

5.0 Conclusion

This scoping review explored the available evidence on the delivery of alcohol-related health advice in dental practice settings. It has found very limited evidence on the topic. First, the review found that ABIs was the only type of intervention used to deliver alcohol-related health advice in dental practice settings. The ABIs had mixed impact on patients' alcohol consumption and other outcomes. Second, the review identified several barriers and facilitators to DPs delivering alcohol-related health advice were identified, including limited time, training, perceptions of the role of DPs, perceived patient discomfort and patient non-compliance to DPs advice, lack of funding and lack of referral resources and follow-on patient care. Third, the review found that dental patients generally reported feeling comfortable with receiving such alcohol-related health advice from DPs, which contrasts with the views of DPs.

The review findings provide a sound rationale for developing further policy, practice and research on the delivery of alcohol-related health advice in dental practice settings. Considerations should be given to conducting robust trials to evaluate the feasibility and potential effectiveness of ABIs in dental practice settings. New and innovative approaches to delivering alcohol advice to patients should be explored and implemented to help reduce the time pressures that traditional approaches place on DPs. Appropriate and tailored training should also be provided on a regular basis to boost DPs' knowledge and confidence to deliver alcohol advice. Appropriate funding should also be provided to dental practices to encourage them to deliver this advice. Collaborative working with DPs, dental patients and policymakers should be encouraged to identify strategic ways in which barriers to delivering advice can be addressed.

Dental practice settings represent a sizeable human resource with great potential to deliver interventions to reduce alcohol-related harm at a population level. Public awareness of the importance of DPs delivering this type of advice along with other general health promotion interventions should be promoted.

6.0 References

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7.0 Funding

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8.0 Conflicts of interest

There are no conflicts of interest in this project.

9.0 Appendix

Table 4 – Inclusion and exclusion criteria

	Inclusion criteria	Exclusion criteria	Rationale
Population	• All categories of dental practitioners	• Non-dental practitioners	Review focused on dental practitioners of all subtypes and settings.
	• Dental patients	• Patients of healthcare practitioners other than dental practitioners	Review focused on dental settings in order to understand dental patient views on receiving alcohol advice directly linked to dental attendances.
Concept	• Interventions involving alcohol-related health advice including verbal or written advice on alcohol consumption and/or harms, and/or screening of alcohol consumption and/or ABIs	• Interventions not involving alcohol-related health advice	Review focused on alcohol specific interventions (e.g., screening studies, brief advice and more structured interventions) to understand the existing range of interventional approaches, discussions or advice in the dental setting
	Experiences, perceptions, attitudes or beliefs of dental practitioners and dental patients to giving/receiving alcohol advice.	• Dental professional/dental patients' knowledge of alcohol as a risk factor for oral and throat cancers • Dental professional/dental patients' knowledge of the impact of alcohol on the body including the oral cavity and throat • Dental professionals' practices regarding oral examinations	Review focused on dental practitioner experiences of implementing alcohol specific interventions to understand the nature of the attitudes and interaction specifically around the encounter of alcohol advice/discussion/interaction.
Context	• Dental practice settings • All geographical areas	• No geographical restrictions	Review aimed to include all relevant evidence and an international perspective. To encompass the widest population experiences and the broadest view of intervention approaches.
Types of sources of evidence	• Primary research studies • Reports from organisations	• Literature and evidence reviews • Opinion papers and letters • News articles	Review aimed to include empirical data and expert opinion. To identify research publications from which primary data available for extraction.

Table 5: Search Strategy

S1	dentist* OR dental practitioner* OR general dental practitioner* OR dental professional*
S2	patient* OR dental patient*
S3	S1 AND S2
S4	alcohol advice OR alcohol screening OR alcohol brief intervention* OR alcohol use
S5	S3 AND S5
S6	attitude* OR belief* OR experience* OR perception* OR perspective*
S7	S5 AND S6

Keywords: dentist professionals, alcohol use, health

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