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DIABETIC Medicine

REVIEW

The English national health service diabetes prevention programme (NHS DPP): A scoping review of existing evidence

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Abstract

Aims: The English National Health Service Diabetes Prevention Programme (NHS DPP) is commissioned by NHS England and has been rolled out across England to adults identified as being at high risk of type 2 diabetes. The present scoping review aimed to identify the extent and nature of evidence to date on the NHS DPP and describe what the evidence has reported.

Methods: A scoping review involving searches of various sources (including MEDLINE, CINAHL, MediArXiv, Google Scholar and GreyLit) was conducted on 31 August 2021 and repeated on 09 February 2022. Only articles reporting on the NHS DPP made available since 2015 were eligible for inclusion.

Results: 65 articles were included. Of these, 37 were journal publications. Most articles were made available in 2018 and 2020 (total $n = 25$). The majority of articles reported on uptake and retention ($n = 27$) whilst others reported on implementation considerations ($n = 24$), programme outcomes ($n = 21$), stakeholder experience ($n = 8$) and screening and referral processes ($n = 3$). Various research methods were reported and included qualitative ($n = 9$) and document analysis ($n = 8$). Articles revealed preliminary evidence on service user characteristics, rates of referral, uptake and retention as well as how far the NHS DPP is being delivered in line with its evidence base and service specification.

Conclusions: The evidence is accumulating on NHS DPP uptake and retention most, with emerging evidence on programme outcomes (such as weight loss and HbA1c). More evidence is warranted on stakeholder experience to decipher how to overcome low initial and long-term engagement reported by the current evidence base.

KEYWORDS

diabetes mellitus, type 2, prevention, public health, referral and consultation, United Kingdom

1 | INTRODUCTION

Worldwide, the number of people living with diabetes is projected to reach 578 million by 2030.[1] Using data from the International Diabetes Federation Diabetes Atlas, diabetes prevalence is recorded as being higher in high-income (10.4%) countries and, alarmingly, one in two adults who are living with a form of diabetes are unaware they have

diabetes.[1] In the United Kingdom, 5.5 million people will be living with diabetes by 2030 with 90% of these individuals having a type 2 diabetes diagnosis.[2] Type 2 diabetes is a life-changing metabolic condition that can result in severe complications if not managed well and diabetes collectively costs the UK National Healthcare Service (NHS) £10 billion annually.[3] Many people are living at increased risk of developing type 2 diabetes and diabetes prevention is an ongoing major public health challenge.

In the United Kingdom, more than 13.6 million people are currently at increased risk of type 2 diabetes, largely due to factors such as having obesity, family history of type 2 diabetes and age.[2] People at increased risk of type 2 diabetes are often described as having prediabetes. Prediabetes phenotypes are defined as hyperglycaemia in the fasting state (impaired fasting glucose, IFG), the postprandial state (impaired glucose tolerance; IGT), or have Non-Diabetic Hyperglycaemia (HbA1c of 42 to 47 mmol/l).[4] In all, these reflect instances where blood glucose is raised higher than normal levels. As of 2019, the global prevalence of IGT alone was estimated to be 374 million and is projected to reach 454 million people by 2030.[1] If global trends continue as predicted, one in 10 people will go on to develop type 2 diabetes and one in three people will be considered obese by 2034.[1]

More broadly, diabetes prevention programmes have been investigated in several countries including the United States, India, Finland and Australia. Trials in Finland and Kerala reported on 2700 participants and 1000 participants, respectively.[5,6] Policy roll outs implemented in the United States and Australia revealed data concerning 14,000 participants and 8400 participants, respectively.[7,8] Evidence from these trials have suggested that such lifestyle changes can lead to a reduced incidence of Type 2 diabetes. Importantly, some people are able to reduce their risk of type 2 diabetes onset by taking action, notably improving diet and increasing physical activity levels can delay or reduce incidence of type 2 diabetes.[9] This approach is supported by the UK's National Institute for Health and Care Excellence (NICE) which encourages the promotion of behaviour change through individual-level intervention.[10] The English National Health Service Diabetes Prevention Programme (NHS DPP) was established as the first national roll out of a diabetes prevention programme.

A joint commitment between NHS England (NHSE), Public Health England (since undergone restructuring to be UK Health Security Agency and Office for Health Improvement and Disparities) and Diabetes UK, people with elevated risk of developing type 2 diabetes are eligible for referral to the NHS diabetes prevention programme behaviour change programme.[11] Specifically, the programme is limited to individuals aged 18 years or over who have non-diabetic hyperglycaemia, defined as having a HbA1c of 42–47 mmol/mol (6.0–6.4%) or a FPG of 5.5–6.9 mmol/l within 12 months prior to referral.[12] Individuals are identified through a number of avenues: flagged as having non-diabetic hyperglycaemia via an NHS health check within the past 12 months, who have already been identified as having non-diabetic hyperglycaemia in the past 12 months via general practice (GP) systems or have been included on a GP register of patients with non-diabetic hyperglycaemia.[12] Newly introduced, individuals can also self-refer to the programme.

Having initially launched in 2015 with several demonstrator sites, the programme also promoted under the title 'Healthier You' is now delivered on a national scale as routine care. The programme is free for all to attend. Multiple independent providers and their digital partners have been commissioned to deliver the programme in localities across England. Each provider must deliver sessions for each programme across a minimum of 9 months' duration and have a minimum contact time of 16 h.[12] Aside from the initial assessment and end review, the sessions in the NHS DPP are delivered in a group format for the face-to-face programme. As an alternative, the digital programme offered to service users does not use a face-to-face group format and instead incorporates digital tools such as wearable technologies and online support groups.[11] The intervention can vary between providers but must be grounded in and delivered in accordance with behavioural theory.[12] The aim of the NHS DPP is to promote healthy eating, a physically active lifestyle and weight loss. It also educates attendees on understanding diabetes risk and future health risk.

This scoping review addresses the following questions:

- What is the extent and nature of evidence to date on the NHS DPP?
- What has this evidence found?

2 | METHODS

Due to the relative infancy of evidence on the NHS DPP, the research questions were best answered with a scoping review. Scoping reviews are an increasingly popular methodology to highlight research gaps to inform future research[13] and offers a broader approach to answer the research question of what is already known, being inclusive of various study types.[13,14]

2.1 | Reporting standards

This scoping review was written in accordance with PRISMA-ScR[15] and followed the Joanne Briggs Institute

Scoping Review Methodology.[16] A protocol was written prospectively to align with institutional requirements to obtain ethical review for evidence syntheses (Coventry University Research Ethics Committee ref #P125872).

2.2 | Eligibility criteria

Only articles focusing on the NHS DPP were eligible for inclusion. No restrictions were placed in terms of study design or the form of article (e.g. published or unpublished). The population of interest was directly aligned to the NHS DPP and could, for example, focus on people who have been identified as being at increased risk of type 2 diabetes and referred to the NHS DPP, NHS DPP service providers or NHS DPP referrers. Articles were excluded if they were made available prior to 2015 (prior to NHS DPP inception), if they were not written in English or related to a diabetes prevention programme outside of England (e.g. Australia, USA, Finland, China).

2.3 | Information sources

Searches were conducted on 31 August 2021 and repeated on 09 February 2022. MEDLINE (all fields), CINAHL (all fields), Scopus (article title, abstract, keywords) and APA PsychINFO (all fields) were searched for eligible articles. To be inclusive of all evidence sources we also searched MediArXiv. These searches were complemented by title level searches in Google Scholar for grey literature[17] as well as searches in Google, OpenGrey and GreyLit. Hand searching of the Public Health England (organisation name accurate at the time of the first search and then the Office for Health Improvement & Disparity for the second search), the ISRCTN registry and two major funding database websites (NIHR and UKRI Gateway) was conducted to identify suitable outputs.

2.4 | Searches

An example search strategy that was used is listed in Table 1. The search strategies used for the other information sources are provided in the Supplementary Material.

2.5 | Selection of sources of evidence

The authors were looking for any form of article that reported evidence relating to the NHS DPP. Notably, this related largely to the following areas: screening and referral process, uptake and retention, stakeholder experience, programme outcomes and implementation considerations. Two independent authors (MW, LB) screened title/abstracts or title/URL of articles before both authors (MW, LB) screened the full texts (or equivalent) for eligibility. Discrepancies (conflicts) between the two authors were logged (number of conflicts and as a proportion of total articles screened) and resolved with discussion as needed. The reference lists of included articles were checked for possible additional articles by one author (LB) and checked for eligibility by two authors (MW, LB). Most of the screening took place in Rayyan, a free-to-use online software to help in identifying eligible articles. Due to restrictions on the type of files that can be uploaded to Rayyan, search results from OpenGrey, GreyLit, Google, Public Health England, ISRCTN (https://www.isrctn.com/), UKRI Gateway (https://gtr.ukri.org/) and NIHR (https://fundingawards.nihr.ac.uk/search) were screened in Microsoft Excel.

TABLE 1 Search strategy used to identify potential items from MEDLINE

Search terms used	Number of search results returned
1. NHS OR 'National Health Service' OR National OR 'NHS England' OR English	1,191,518
2. ' Diabetes prevention program' OR 'diabetes prevention programme'	611
3. #1 AND #2	251
4. NHS-DPP OR NHS DPP OR NDPP	82
5. Type 2 prevention and control [word in Major Subject Heading]	10,458
6. Published 2015 or later	—
7. #3 OR #4 AND #5 AND #6 (NHS OR 'National Health Service' OR National OR 'NHS England' OR English) AND ('diabetes prevention program' OR 'diabetes prevention programme') OR (NHS-DPP OR NHS DPP OR NDPP) AND MJ type 2 prevention and control	352

2.6 | Data charting process

Microsoft Excel was used to collect information about the evidence source and its findings from each included item. Data charting was conducted by two authors independently (MW, LB). The form used to chart data was tested on one eligible item before being used for the remaining articles. No instances of missing data were noted so no study or source authors were contacted for information. Findings were not formally synthesised as this is not within the remit of scoping reviews.[13] The total number of counts in the findings may be higher than the total number of included articles because some articles focused on more than one area.

2.7 | Data items

Data charting mapped the data in a logical format to identify key findings and gaps in the research. Data charting identified year of publication or availability, evidence source (e.g. published, pre-print, report), aim of research (e.g. improve NHS DPP uptake), methodology/study design (e.g. qualitative, commentary), area of evidence (e.g. policy, clinical, economic), data collected (e.g. number of referrals, sites and service users) and key findings.

2.8 | Critical appraisal of individual sources of evidence

A critical appraisal was not conducted to assess the individual sources of information as this is not the aim of scoping reviews.[15]

2.9 | Synthesis of results

Data for the included articles were charted in table format. A narrative summary was presented to summarise the characteristics of the included articles.

3 | RESULTS

3.1 | Section: Results of the search strategy and selection process

3.1.1 | Selection of sources of evidence

The original search identified 2517 studies from the various sources (Figure 1), from which 641 duplicates were removed. A total of 1876 titles and abstracts were screened against the eligibility criteria before retrieving 238 full texts. Sixty-five articles were included at full-text stage. Two key reasons for exclusion were not reporting the NHS DPP (n=88; 50.9%) or evidence about the NHS DPP (n = 55; 32.8%). A list of excluded articles at the full-text stage with their reasons is provided in the Supplementary Material.

3.2 | Section: Key information or results relevant to objectives or questions of review

All articles were made available or published in 2016 or later. Most publications were dated as 2018 or 2020 (n = 14), followed by 2019 (n = 12) and 2021 (n = 9), with the fewest dated as 2016 (n = 5) and 2022 (n = 3). In total, there were 37 journal publications, eight presentations, seven conference abstracts, seven reports and six were classified as other (CPD module information sheet, news article, brochure, case study). Below is an overview of the included articles in relation to the two research questions. A detailed list of characteristics for each included article is provided in the Supplementary Material.

3.2.1 | Extent and nature of evidence to date on the NHS DPP

Screening and referral process

Three included articles report on the screening and referral process.[18-20] In the form of a report, NHS Digital (2017) report on a pilot exercise looking at GP practice data[18] whilst Barron et al. (2020) published findings from an evaluation of how point of care testing compares to laboratory-measured referrals.[20] Knowles et al. (2019) conducted a mixed-methods evaluation.[19]

Uptake and retention

Twenty-seven articles reported on programme uptake and rates of retention, of which 11 (40.7%) were publications.[19,21-30] The remaining articles comprised six presentations,[31-36] three abstracts,[31,37,38] three reports,[35,39,40] one CPD module,[41] a news article,[42] an information sheet[43] and a case study.[44] Most of these articles were a commentary in design, with the others including pre-post studies,[25] cohort studies (retrospective/prospective),[23,24] mixed-methods research,[19] case studies[41] and cross-sectional surveys.[27] More and more evidence is accumulating in this area since three were made available in 2017.[39,41,43]

Stakeholder experience

Eight articles were identified focusing on stakeholder experience.[25,36,44-49] Four incorporated qualitative research methods such as semi-structured interviews[45,46,48,49] or a

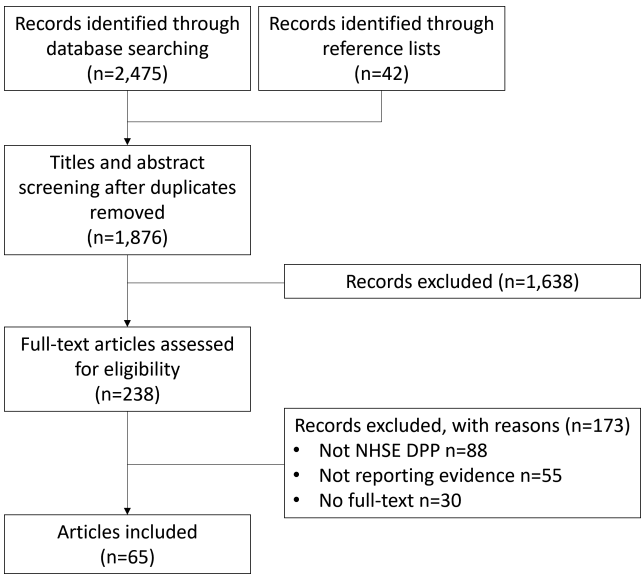

FIGURE 1 PRISMA flow diagram showing selection of studies included in the review

combination of interviews, focus groups and cross-sectional survey.[49] One presented a case study,[44] another they termed qualitative insight through anecdotal data and focus groups,[36] a participant survey[47] and the other presented findings on stakeholder experience from a pre-post design.[25] All these articles were published between 2018 and 2022.

Programme outcomes

A total of 21 articles reported on programme outcomes. Eight of these were published articles[22,23,25,50,S51–S55] with the remaining taking the form of six presentations,[32-36,S56] three abstracts,[31,37,S57] a report,[35] an information sheet,[18] a brochure,[47] and a CPD module.[41] One article was made available in 2016.[50] Since then, several have been made available each year: four in 2017,[41,43,S52,S57] five in 2018,[22,32-34,S51] six in 2019,[25,35,37,38,S53,S56] four in 2020,[23,31,36,S54] and one in 2022.[S55]

Implementation considerations

Twenty-four articles were categorised as reporting on implementation considerations. The majority ($n = 16$) were published,[S51,S58–S71] with other articles taking the form of abstracts ($n = 3$),[S72–S74] reports ($n = 2$)[S75,S76] and case studies ($n = 2$)[S77,S78] as examples. Approximately 50% of this evidence has been released in the last few years (2020–2021).[S59,S60,S62,S63,S66,S69,S71,S72,S74,S77,S79]

3.2.2 | Evidence of findings to date

Screening and referral process

The NHS Digital report released in 2017 wanted to understand the quality of information stored in GP practices and revealed that across the 19 GP practices used, 73.% of people at high risk of type 2 diabetes were not recorded with a diagnosis of prediabetes.[18] They recommended that GP practices check and implement the appropriate read codes to ensue eligible individuals for the NHS DPP are appropriately identified and referred. The other article from Barron et al. (2020) examined point of care testing compared to laboratory-measured referrals in 73,703 participants and demonstrated that point of care HbA1c testing in community settings was associated with significantly lower HbA1c values when compared to the laboratory-acquired values.[20] Knowles et al. (2019) report how the majority (88%) of referrals were from primary are compared with community referrals (5%).[19]

Uptake and retention

Several articles report on uptake and retention to the NHS DPP. In terms of the number of referrals, Bakhai et al (2020) report on the nearly 800,000 referrals since launch and PHE (2018) report on 3000 referrals in the first months within Luton.[21,44] From a database of 1.3 million with non-diabetic hyperglycaemia, an NHS Digital article confirms nearly 150,000 have been offered the NHS DPP.[35] In regard to uptake more broadly, rates vary including ~45% (of 154,000) people taking up spaces[30] and 64% (of 5053) registering for the programme.[25] For the digital delivery of the NHS DPP rates are higher at 68% (of 5337) uptake.[29,31] Knowles 2019 comment on how uptake is higher among primary care referrals.[19] Barron 2018 noted that referral numbers and percentage uptake as being in excess of prior modelled values[27] and NHS 2018 reporting referrals as exceeding targets.[42] However, the Greater Manchester Health and Social Care Partnership (2019) report how uptake is much lower than projections attributed to the Covid-19 pandemic situation.[40] In terms of who is being reached, one article reported that uptake is balanced in terms of gender with an average age of 67 years.[39] Other articles report that the programme is reaching people at greater risk of type 2 diabetes, notably males and people from higher deprived areas and from an ethnic minority background.[28] The availability of a digital delivery appears to be reaching younger people and people of a working age.[26] Howarth 2020 reports on how uptake can vary across providers and participant groups with uptake highest in older women from least deprived areas.[24] Decisions to decline participation are high in people from deprived and BAME backgrounds.[23]

Some articles refer more specifically to uptake to the initial assessment which includes 40% (of 43,603 referrals),[27] 53%,[36] ~66,000 (of more than 230,000 referrals),[34] 40% (of 21,223 referrals),[38] 47% (of 324,706 referrals),[37] 53% (of 533,998 referrals),[31] 53% (of 324,699 referrals)[23] and 78% (of 182,000).[33] Others report on attendance at the

first intervention session with rates varying from 50,000 of 104,000,[34] 96,442 of 152,294,[37] 38%,[31] 36%[23] and one article reporting a much higher attendance rate (94%).[38] Beyond this timepoint, articles report on progress through the NHS DPP in different ways. For example, Wise 2018 report that 2277 participants attended at least eight sessions.[22] Valabhji, Martin and Newbound (2018) report 17,252 attended at least 60% of sessions. Coles 2019 report 80% attended at least 3 sessions.[38] Murray 2019 report 2687 of 3233 people reached the 6-week timepoint.[25] Howarth 2020 report 34% attended 60% of sessions.[24] Another article comment on a 79% retention rate at 3 months for the digital delivery.[31] Valabhji 2020 report how 19% (of 152,294) completed at least 60% of sessions[23] whilst Cotterill 2017 refer to retention remaining fairly high.[39] Henson 2017 report attendance at 'core' sessions as being between 75–83% and at 'maintenance' sessions as being between 68–81%.[41] Valabhji 2018 report 52% (of more than 104,000) attended at least 8 of 13 sessions[34] and Coles 2019 comment on how 80% participants attended at least 3 sessions.[38] In terms of completing the NHS DPP, Howarth 2020 report that approximately one in five (22%) do as defined by attending the final session or completing final outcome measures.[24] People who were younger, had an Asian ethnicity, a lower socioeconomic status and baseline obesity were found to have poorer rates of completion.[37]

Stakeholder experience

In terms of experiences related to the NHS DPP, positive feedback has been collected from GPs and service users, reporting the programme as feasible and acceptable.[25] In their case study, PHE (2018) reported how GPs have responded positively with high rates of referrals and engagement.[44] In a presentation by Bakhai and Hopwood (2020), findings revealed that both health professionals and potential participants felt a need to know more about the programme.[36] Twohig et al. (2019) conducted 23 semi-structured interviews and revealed that social circumstances could be a notable barrier to uptake due to other life priorities competing against their health.[48] Katangwe et al. (2020) reported findings from 181 survey respondents and 10 interviews and one focus group.[49] Findings included how accessibility might be improved by involving community pharmacies in programme pathways and delivery. In a more recent qualitative study, Miles et al. (2021) revealed a wide variation in understanding among NHS DPP participants for some behaviour change techniques as well as between behaviour change techniques.[45] The authors reflected on how some participants struggled to recall 'action planning' or 'problem solving' and thus additional support was needed to fully grasp these techniques. Begum et al. (2022) investigated influences of decisions to attend the NHS DPP from people living in a socioeconomically deprived area.[46] Their findings revealed how motivation to attend the programme was influenced by understanding of type 2 diabetes, previous experience and beliefs. In addition, how accessibility and practicalities influence attendance and motivation to attend. One article reported on how >95% responded positively to using skills learned from the NHS DPP, how the programme has helped them improve their eating habits and how it was supportive and encouraging for them.[47]

Programme outcomes

Several psychological and behavioural benefits have been observed by Phillips (2016).[50]

In regard to weight status, several articles have reported reductions in weight. Henson et al (2017) report a reduction of 2.5 kg over 6–12 months with 75% losing weight as of the follow-up session.[41] At 6 months, average weight change was reported as being −2.6 kg in the Tower Hamlets Together report.[S56] Valabhji et al. (2018) report a mean weight change of −3.2 kg for completers (minimum of 8 of 13 sessions attended).[34] Wise et al. (2018) note that over 9 months, a mean loss of 3.3 and 3.7 kg were identified for all participants and participants excluding those with a normal body mass index, respectively.[22] From a digital pilot of the NHS DPP, Murray et al. (2019) reported similar values with a mean reduction of 4 kg at 6 months[25] whilst others report a 3.3 kg loss for programme completers (defined as attending 60% of sessions).[32,36,37] Signs of encouraging weight loss were mentioned by both Valabhji et al. (2020)[23] and an NHS Diabetes Prevention Programme article.[43] In total, REED Wellbeing refer to 154,000 kg lost across all participants in their delivery of the NHS DPP, with an average loss of 5.4 kg per participant.[47] The most recent article on changes in weight revealed reductions of 3.6 kg for completers (attended the final session or had a final measurement plus attended at least 60% of sessions).[S55] Values for HbA1c have reported reductions of 1.6 mmol/mol at 6 months,[25] 2.0 mmol/mol at programme completion (60% of sessions attended),[37] 2.04 mmol/mol at programme completion (60% of sessions attended),[31] 2.0 mmol/mol at programme completion,[32] 2.1 mmol/mol at programme completion (60% of sessions attended plus attendance at final session or had data reported),[S55] and described as reduced by Youngman et al. (2017)[S57] and encouraging by Valabhji et al. (2020).[23] During a 2.5 year follow-up, Nguyen et al. (2020) reported that 3.13% of NHS DPP attendees developed type 2 diabetes compared with 6.42% in the control group.[S54] Another article from Phillips (2016) comment on a 67% reduction in progression to type 2 diabetes diagnosis at 6 months.[50] Other articles report there is currently insufficient levels of evidence on outcomes[35] with Fagg et al. (2019) commenting that

it may take as many as 12 years to realise financial and health benefits.[S53] One article suggests it is likely to be cost-effective and cost-saving under current assumptions with greatest value for money obtained for individuals with obesity and those aged 40–74 years.[S52]

Implementation considerations

Numerous articles were identified as referring to implementation considerations. In regard to delivery of the NHS DPP, Taylor et al. (2018) reported that the programme is delivering and developing well.[S65] Hawkes et al. (2020) identified good fidelity to specified service parameters albeit four providers delivered only 14 of 19 behaviour change techniques specified by the NHS DPP.[S79] Reporting on results from the pilot of the face-to-face NHS DPP, Penn et al. (2018) noted that the programme specification reflected the evidence base for behaviour change, but there was a lack of clarity from providers on procedures to ensure programme fidelity and specification procedures.[S51] Similarly, reflecting on pilot face-to-face programme delivery, Haste et al. (2018) identified areas of discrepancy and discontinuity between document types.[S64] Hawkes et al. (2020) refer to structural issues (large groups, venue, poor scheduling) which, if overcome, could improve uptake, retention, interaction and programme effectiveness.[S70] NHS Informatics Merseyside (2017) in their report outlined the need to re-design and upload the revised referral letters and patient information sheets to promote referral.[S78]

Building on this, Hawkes et al. (2021) reported that none of the providers specified a logic model of how the programme would produce changes in behaviour.[S60] Goal-setting has also been identified as being underdelivered in the programme[S79] and staff training in behaviour change techniques as currently underdelivered.[S79] French et al. (2021) report this under-delivery of courses and note the reason for under-delivery as being due to inadequate translation of programme specification into provider delivery manuals.[S62] One article from Guenther et al. (2020) investigated people's responses to two different letters with the design adjusted to increase uptake and adherence to the NHS DPP.[S77] Unexpectedly to the original study authors, findings revealed that more people in the control group responded to the letter, rather than the intervention letter; highlighting the importance of referral communication. Rodrigues et al. (2020) noted that to combat health inequalities, a better risk communications specification could improve referral processes with cultural adaption and outreach strategies important.[S71] More broadly, articles focused on how community pharmacy could be an appropriate and accessible setting in diabetes prevention.[S67] In addition, how the NHS DPP is warranted but will need to adjust to demand pressures[S68] and overcome the challenges associated with implementing national programmes.[S74]

In the long-run, it was reported by one article that the NHS DPP should be cost-saving by year 12.[S53] Cost-effectiveness has been reported elsewhere which showed that the NHS DPP would remain cost-effective with a 5% point increase in uptake; highlighting there is room for investment.[S59] Another study reported findings in a conference abstract concluded that the NHS DPP has the potential to reduce type 2 diabetes incidence but requires substantial participation and increased long-term effectiveness.[S72] A more recent article by Valabhji et al. (2021) used NHS DPP data to reveal that participants entering the programme in 2020–21 tended to be younger than those entering in preceding years.[S63] In addition even after adjustment for age, sex, ethnicity and socioeconomic deprivation, the mean body weight of people entering the programme during the Covid-19 pandemic was 0.68kg greater than that of people entering the programme in the three years prior.[S63]

4 | DISCUSSION

This scoping review highlighted the extent and nature of evidence on the NHS DPP available to date and their findings. The review's findings lead to several implications for future research.

4.1 | Extent and nature of evidence on the NHS DPP

Year on year since inception in 2015 the availability of evidence on the NHS DPP has increased and will likely continue to increase in the coming years. However, it is worthwhile noting that the most common evidence type identified in this scoping review is commentary based. There is a need for more primary evidence on the NHS DPP. This scoping review has also identified that several presentations and conference abstracts have been presented and submitted, respectively, to present preliminary findings with service users, academics, healthcare professionals and other key stakeholders. Given the NHS DPP is a programme implemented as standard care for people at risk, these are an appropriate mode of disseminating findings alongside peer-reviewed publications.

Evidence to date has largely focused on uptake and retention followed closely by implementation considerations. The evidence has often focused on whether the providers deliver the programme as intended (fidelity) as well as the number of people who were referred, who attended and who completed the programme. Given the NHS DPP

is still early on in its nationwide implementation, presenting evidence on these two key elements seems appropriate. Another key focus has been the cost-effectiveness of the programme. Focusing on these areas has helped many of these articles develop recommendations to improve the NHS DPP. However, this scoping review has highlighted that more evidence is needed on the effectiveness of the programme (including longer-term, months after programme attendance) and the extent of effectiveness for particular groups of people. The authors are aware from the searches conducted that there is ongoing research in this area through the NIHR-funded DIPLOMA research programme which is covering various aspects including access and equity, implementation, outcomes, long-term effectiveness and service fidelity (HS&DR 16/48/07).

4.2 | Findings of the evidence

Findings of the included articles have confirmed that approximately one in two people referred to the programme attend the first individual assessment.[24,38] However, when the evidence presents how many people attend the first group session of the programme, the results vary much more widely. One article reported that one in three people attend the first session (36%)[31] whilst another report that nearly all do attend (94%).[38] This variation in attendance was not as varied for articles reporting on attendance at subsequent visits with 19–53% of people attending at least 60% of the NHS DPP.[23,24,27,32] Vast variations in completion definitions were noted, however, between studies. Efforts to improve programme retention are highly warranted given that as few as one in five attendees may go on to complete the full programme.[24]

The evidence also suggests that of those that do get referred to the programme, the average age has been reported as 67 years but balanced in terms of gender.[39] To help diversify the demographics of those referred to the programme, a digital delivery of the programme has been developed and implemented. Digital delivery has been reported to engage younger people at risk of type 2 diabetes.[26,29] Other adaptations to the NHS DPP are likely needed to further enhance engagement given that digital delivery reported 60–68% uptake with 79% retention at 3 months.[29] Sustained NHS DPP engagement is crucial to obtain the physiological, psychological and behavioural benefits from attending. It should also be acknowledged that for articles reporting on data collected by the NHS DPP, data was only collected on those who continued to attend the programme, so the outcomes of people who dropped out are unknown. Capturing data on those who drop out must be prioritised also, where possible. More research exploring how best to improve initial engagement and sustained engagement with the NHS DPP within specific groups of people is warranted. Based on evidence to date these groups include working age adults, adults from deprived backgrounds and adults from an ethnic minority background. Given the paucity of qualitative research to date, the involvement of key stakeholder input (both service users and professionals involved in NHS DPP delivery) will be crucial in co-designing and evaluating initiatives targeting improved uptake and retention.

5 | CONCLUSION

There is accumulating evidence on the NHS DPP, including both peer-reviewed publications and other non-peer-reviewed evidence such as presentations, reports and conference abstracts. There is growing evidence on programme uptake and retention and emerging evidence exploring programme effectiveness but there is a paucity of evidence on ways to improve the low initial and long-term engagement reported. Further research is warranted in these particular areas to improve programme success.

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None to declare.

CONFLICT OF INTEREST

None to declare.

AUTHOR CONTRIBUTION

MW conceived the idea of the work, was involved in the acquisition, analysis and interpretation of the work, drafted the work, gave final approval of the version to be published and agrees to be accountable for the work presented. LB was involved in the design of the work, the acquisition, analysis and interpretation of the work, revised the work critically for important intellectual content, gave final approval of the version to be published and agrees to be accountable for the work presented.

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SUPPORTING INFORMATION

Additional supporting information may be found in the online version of the article at the publisher's website.

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