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ACCEPTABILITY OF FINANCIAL INCENTIVES FOR ENCOURAGING UPTAKE OF HEALTHY BEHAVIOURS: A CRITICAL REVIEW USING SYSTEMATIC METHODS

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ABSTRACT

Objective

~~Evidence suggests that f~~Financial incentives are effective in encouraging healthy behaviours, yet concerns about ~~their~~ acceptability remain. We conducted a systematic review ~~to~~ ~~explore~~exploring the acceptability of financial incentives for encouraging healthy behaviours ~~amongst adults~~.

Method

Database, reference, and citation searches were conducted ~~until~~from the earliest available date to ~~November 2012~~October 2014, to identify empirical studies and scholarly writing. ~~Studies were included if they that~~: had an English language title, were published in a peer-reviewed journal, and explored ~~the~~ acceptability of ~~health promoting~~ financial incentives for health behaviours in members of the public, potential recipients, potential practitioners or policy makers. Data was analysed using thematic analysis.

Results

~~Fifty four~~Eighty one papers were included: ~~40~~59 pieces of scholarly writing and ~~14~~22 empirical studies, ~~primarily exploring acceptability to the public~~. Five themes were identified: ~~1)~~ fair exchange, ~~2)~~ design and delivery, ~~3)~~ effectiveness and cost-effectiveness, ~~4)~~ recipients, and ~~5)~~ impact on individuals and wider society. Although t~~There was consensus that if financial incentives are effective and cost effective,~~ ~~then~~ they are likely to be considered acceptable, ~~a~~ number of other factors also influenced acceptability.

Conclusion

Financial incentives tend to be acceptable to the public when they are ~~demonstrated to be~~ effective and cost-effective. ~~Programmes that benefit recipients and wider society; are considered fair; and are delivered to individuals,~~ ~~who are~~ deemed appropriate, are likely to be considered more acceptable.

INTRODUCTION

Poor engagement in healthy behaviours is a key determinant of morbidity and mortality and results in social, healthcare and economic costs (Swann et al., 2010). Despite efforts to encourage healthy behaviours, unhealthy behaviours remain common (Department of Health, 1998, Department of Health, 2004).

Providing financial incentives to encourage healthy behaviours is one method to encourage uptake of healthy behaviours. Health promoting financial incentives (HPFI) are cash or cash-like rewards provided contingent on performance of healthy behaviours (Adams et al., 2013). Our recent systematic review of the effectiveness of HPFI found that financial incentives were around 1.5 to 2.5 times more effective for promoting healthy behaviours than no intervention or usual care (Giles et al., 2014).

In the United States of America (USA), the 2010 Affordable Care Act allowed employers to offer rewards, or impose penalties, for those meeting healthy behaviour targets such as quitting smoking (Madison, Volpp and Halpern, 2011). Similar HPFI operate within the German social health insurance scheme (Schmidt, 2008). In the United Kingdom (UK), the current government have signalled their interest in using HPFI as part of their ‘nudge’ ~~economies~~-agenda (Department of Health, 2010). Despite this empirical and political support for HPFI, the acceptability of HPFI interventions has been questioned (Popay, 2008, Cookson, 2008).

Acceptability of public health interventions must be considered from the point of view of a number of stakeholders. ~~Relevant stakeholders i~~In relation to HPFI, ~~these~~ -include potential recipients, professionals and policy makers responsible for intervention implementation, and the general public who may finance interventions through taxation. ~~T~~~~A~~~~l~~~~l~~ of ~~these stakeholder~~ groups must be ~~both~~ willing and able to engage with ~~any an~~ intervention (Craig et al., 2008), ~~otherwise it is unlikely that if any~~ HPFI ~~will are to~~ be widely implemented, ~~even if effective and cost-effective~~.

Acceptability of interventions can be explored in primary research. However, scholarly critique also constitutes valuable evidence, as it is likely to reflect the opinion of ~~some~~ important

stakeholders. We conducted a review to bring together both empirical evidence and scholarly writing on the acceptability of HPFI. We were particularly interested in what features of HPFI have been identified as potentially acceptable and unacceptable, the range of methods that have been used to determine acceptability, and the range of individuals in which acceptability has been explored.

METHODS

This review is reported in accordance with the Preferred Reporting Items for Systematic Reviews (PRISMA-checklist) guidelines (Moher et al., 2009) ([Appendix A](#)). Given the non-standard nature of the inclusion criteria and data collected, we did not register our protocol in advance. A copy of the a-priori protocol is available from the authors on request. No substantive changes to the protocol were made.

Information sources

Electronic databases were searched from the earliest date available ([indicated in brackets below](#)) until [November 1st October 2012](#)~~4~~, for primary research and scholarly writing, exploring the acceptability of HPFI. Databases searched were: Medline ([1946](#)), Embase ([1980](#)), Web of Knowledge ([1970](#)), Cumulative Index to Nursing and Allied Health Literature ([1981](#)) ([CINAHL](#)), [PsycInfo](#)~~PsycINFO~~ ([1806](#)), Applied Social Science Index and Abstracts ([1970](#)), Sociological Abstracts ([ProQuest, 1952](#)), Scopus ([1960](#)), The Philosopher's Index ([OVID, 1940](#)), the Cochrane library ([Issue 3](#)), [Social Science Citation Index \(1970\)](#) and the International Bibliography for the Social Sciences ([1951](#)). An example of the full electronic search used in Medline is shown in [Box S1](#)~~Appendix B~~. The search was adapted as required for other databases. All studies included in our systematic review of the effectiveness of HPFI (Giles et al., 2014) were considered for inclusion, and reference and citation searches of included papers [as well as relevant reviews identified in the search](#) were conducted.

Eligibility criteria

Papers that met the following criteria were included: had an English language title; were published in a peer-reviewed journal; and explored the acceptability of HPFI from the perspective of: members of the public, potential recipients, potential practitioners who may be

involved in delivering HPFI, or policy makers. Specifically, all included papers used the term 'acceptable', 'accept', 'acceptability', 'unacceptable' 'ethics', 'moral' or some variation of these. HPFI were defined as cash or cash-like rewards, which were provided contingent on change in a healthy behaviour. Only papers exploring acceptability of HPFI delivered to adults living in high income economies (defined by the World Bank as those countries with a Gross National Income of \$12,276 or more per capita in 2010) were included. Empirical studies were defined as papers reporting primary data. Scholarly writing was defined as referenced writing; for example, position papers and editorials (Schmidt, 2008, Popay, 2008, Madison, Volpp and Halpern, 2011, Cookson, 2008). The review focused on high income economies because the health care and economic contexts of such countries are different from lower income economies, and are unlikely to be comparable.

Paper selection and data collection

After exclusion of duplicates, one researcher (ELG) screened titles and excluded those definitely not relevant. Next, the same researcher screened remaining titles and abstracts, again excluding those definitely not relevant. Finally, remaining full texts were screened by two researchers independently (ELG & JA) to identify those meeting the inclusion criteria. If in doubt, papers were retained at any stage for inspection by both reviewers, with disagreements resolved by discussion.

Quality assessment

Quality assessment of scholarly writing was not undertaken as no appropriate tool could be identified. The quality of empirical research papers using qualitative methods was assessed using a tool developed by Petticrew and Roberts for this purpose (Barnard et al., 2010, Petticrew and Roberts, 2005). Papers using quantitative methods were assessed using the Effective Public Health Practice Project (EPHPP) Quality Assessment Tool (Effective Public Health Practice Project, 2009). Two researchers (ELG and JA) conducted quality appraisal independently and disagreements were resolved by discussion. Papers using mixed methods were appraised using both tools as appropriate.

Synthesis of results

Data was extracted by one researcher (ELG) and summarised in tabular format. Empirical studies were considered to be too heterogeneous for meta-analysis. Although three studies did use, or adapt, the same questionnaire, adaptations were so substantial that there was too little combinable data to justify meta-analysis (Long, Helweg-Larsen and Volpp, 2008, Lynagh et al., 2011). Instead, thematic synthesis of all included papers was undertaken, focusing on issues related to the acceptability of HPFI. In this, findings from empirical studies were integrated with issues discussed in scholarly writing.

The full texts of included papers were uploaded into NVivo 10 QSR International software and thematically coded (Barnett-Page and Thomas, 2009). The first stage involved close reading and identification of codes (Bryman, 2004, Strauss, 2003). Next, papers were re-read and codes checked to ensure no data was missed. Thirdly, codes were sorted into categories, with some codes being merged with others or re-named, and new codes emerging. Finally, codes were interpreted in light of the research questions. The first three stages were completed by one researcher (ELG). The final stage was led by one researcher (ELG) with discussion and verification by a second (JA).

Once the coding was finalised a narrative was built by describing, linking and interpreting the codes. The themes are presented in the results, with representative quotes illustrating each theme presented in boxes for each theme. In addition, these quotes provide ‘evidence’ to support our results and justification for the conclusions we draw. Each quotation included in the boxes is identified both by a formal citation, and as either an ‘empirical paper’ or ‘scholarly writing’ to clarify the source of different statements.

A citation map was ~~also~~ drawn to show the citation links between included papers. This allowed key papers in the corpus of included papers to be identified.

RESULTS

~~Fifty five~~ Eighty one papers met the inclusion criteria: ~~14~~ 22 empirical studies (Allan, Radley and Williams, 2012, Arterburn et al., 2008, Bonevski, Bryant and Paul, 2011, Bonevski et al., 2012, Cameron and Ritter, 2007, Ducharme et al., 2010, Hoddinott et al., 2014, Kim et al., 2011, Long,

Helweg-Larsen and Volpp, 2008, Luyten et al., 2013, Lynagh et al., 2011, Mantzari, Vogt and Marteau, 2012, Meads et al., 2013, Meredith, Grabinski and Dallery, 2011, Mhurchu et al., 2011, Park, Mitra and Asch, 2012, Parke et al., 2013, Promberger et al., 2011, Promberger, Dolan and Marteau, 2012, Raiff et al., 2013, Ritter and Cameron, 2007, Thomson et al., 2012) and ~~40-59~~ pieces of scholarly writing (see Figure 1 and Tables ~~S1~~ and ~~S2~~) (Ashcroft, 2011, Ashcroft, Marteau and Oliver, 2008, Aveyard and Bauld, 2011, Axtell-Thompson, 2012, Blacksher, 2008, Blumenthal-Barby and Burroughs, 2012, Burry, 2006, Cawley, 2014, Cookson, 2008, Dreger, 2012, Donatelle et al., 2004, Grant, 2002, Grant, 2006, Goel, 2012, Halpern, Madison and Volpp, 2009, Haveman, 2010, Higgins et al., 2012, Horwitz et al., 2013, Kennedy, 2012, Klein, 2012, Klein and Karlawish, 2010, Kowal, 2006, Lawson and Howard, 2012, Lesser and Puhl, 2014, Lewis, 2008, Loepke, 2012, London et al., 2012, Lunze and Paasche-Orlow, 2013, Luyten et al., 2011, Madison, Volpp and Halpern, 2011, Malone and Jason, 1990, Marteau, Ashcroft and Oliver, 2009, Marteau, Oliver and Ashcroft, 2008, Meredith et al., 2014, O'Donnell, 2012, Oliver, 2009, Oliver, 2012, Oliver and Brown, 2012, Pearson and Lieber, 2009, Petry, 2010, Popay, 2008, Robison, 1998, Roozen, 2009, Schmidt, 2008, Schmidt, 2012, Schmidt, Gerber and Stock, 2009, Schmidt, Asch and Halpern, 2012, Schmidt, Voigt and Wikler, 2009b, Serxner, 2013, Sindelar, 2008, Stephens, 2014, ten Have et al., 2013, Terry, 2013, Terry and Anderson, 2011, Voigt, 2012, Volpp and Galvin, 2014, Volpp et al., 2009, Volpp, Galvin and Loewenstein, 2011, Wu, 2012)

A further three papers were included at the title and abstract stage but none of these texts could be located (Botelho, 2012, McCormack, 1996, Tuten et al., 2012) and they were excluded from the review.

Empirical studies collected data using surveys (n=~~13~~), including one Discrete Choice Experiment (Promberger, Dolan and Marteau, 2012); (Arterburn et al., 2008, Bonevski et al., 2012, Hoddinott et al., 2014, Kim et al., 2011, Long, Helweg-Larsen and Volpp, 2008, Luyten et al., 2013, Lynagh et al., 2011, Meads et al., 2013, Meredith, Grabinski and Dallery, 2011, Park, Mitra and Asch, 2012, Promberger et al., 2011, Ritter and Cameron, 2007, Raiff et al., 2013), individual semi-structured interviews (n=~~32~~) (Allan, Radley and Williams, 2012, Cameron and Ritter, 2007, Mantzari, Vogt and Marteau, 2012), and mixed methods (n=~~34~~) (Bonevski, Bryant

and Paul, 2011, Ducharme et al., 2010, Mhurchu et al., 2011, Thomson et al., 2012) and one thematic analysis of media coverage (Parke et al., 2013). Study populations were primarily members of the public (n=170) (Allan, Radley and Williams, 2012, Arterburn et al., 2008, Bonevski et al., 2012, Hoddinott et al., 2014, Kim et al., 2011, Long, Helweg-Larsen and Volpp, 2008, Luyten et al., 2013, Lynagh et al., 2011, Mantzari, Vogt and Marteau, 2012, Mhurchu et al., 2011, Park, Mitra and Asch, 2012, Promberger et al., 2011, Promberger, Dolan and Marteau, 2012, Raiff et al., 2013, Meads et al., 2013, Meredith et al., 2014, Thomson et al., 2012), or health professionals and managers (n=3) (Cameron and Ritter, 2007, Ducharme et al., 2010, Ritter and Cameron, 2007). One study included a mixed population of clinicians, health professionals, administrative staff and members of the public (Bonevski, Bryant and Paul, 2011), and one study reported the content of media coverage of relevant information (Parke et al., 2013).

Quality appraisal of empirical studies is summarised in Figure 2 and Table S3. Qualitative studies were largely rated as ‘good’. However many quantitative studies did not include a clearly representative sample, justify their sample size, or provide good evidence of generalisability of findings. Acceptability is, by its nature, subjective. Nevertheless, no aspects of reliability or validity of survey instruments were discussed or reported. Many Three studies used the same survey instrument, or an adaptations of itadaptations of the same survey instrument (Long, Helweg-Larsen and Volpp, 2008, Lynagh et al., 2011).

Citation mapping

Figure 3 shows the number of times that included papers were cited by other included papers. Twenty sevenForty two included papers cited at least one other included paper, and 23 40 were cited by at least one other included paper. The most frequently cited papers were Marteau, Ashcroft and Oliver (2009) (Marteau, Ashcroft and Oliver, 2009) – a piece of scholarly writing in a high profile general medical journal - and Long, Helweg-Larsen and Volpp (2008) (Long, Helweg-Larsen and Volpp, 2008) - an empirical study describing the survey instrument most commonly used in subsequent research.

What makes HPFI acceptable or unacceptable?

The thematic synthesis identified five themes: 1) fair exchange, 2) design and delivery, 3) effectiveness and cost-effectiveness, 4) recipients, and 5) impact on individuals and wider society. Most included papers explored acceptability from the point of view of the general public. Where this was not the case, this is highlighted in Tables S1 and S2 and in the discussion below.

Theme 1: Fair exchange

Health promoting financial incentives involve an exchange between the recipient and the incentive provider. The recipient benefits from both the behaviour incentivised and the incentive offered, whilst the provider benefits from the improvement in public health brought about by the change in ~~behaviour~~ behaviour. This ‘fair exchange’ was identified as an important aspect of acceptability by a number of authors (see Box 12a).

Some authors of included papers argued that if parties act voluntarily, the mutual benefits of HPFI make them acceptable. This was the case when HPFI offset the opportunity costs of giving up non-healthy behaviours, providing additional motivation for behaviour change (see Box 12b).

Other authors argued that as the target recipients of HPFI are often vulnerable groups, who are most in need of financial resources, the choice to engage is rarely ‘voluntary’. Instead, these authors view HPFI as coercive (Blumenthal-Barby and Burroughs, 2012). The ‘fair exchange’ of HPFI is also contested by some who argue that HPFI discriminate against those who pursue healthy behaviours without the need for incentives and those who are unable to comply with behavioural change programmes (see Box 12c) (Schmidt, Voigt and Wikler, 2009).

Theme 2: Design and delivery of HPFI

Health promoting financial incentives are complex interventions that can vary in at least nine domains (Adams et al., 2013). The design and delivery of HPFI, in part, contributed to whether they were perceived as acceptable or not. Additionally, if HPFI were found to be effective, they tended to be more accepted. In general, if HPFI are safe, focused on the recipients, minimise intrusion into their daily lives, and are of an effective - but not too large - amount, then they are viewed as acceptable.

Two particular concerns were raised in reference to appropriate providers of HPFI. Firstly, empirical research has found that many socio-economically disadvantaged individuals are not willing to accept government funded HPFI under any circumstances – although reasons for this have not been explored. Secondly, the potentially negative impact of HPFI administered by doctors on doctor-patient relationships is considered potentially-problematic, ~~although no supporting empirical evidence was given~~ (see Box [23a](#)).

Incentives which are provided with higher frequency (Volpp et al., 2011, Volpp et al., 2009) and nearer to the point of behaviour were considered more acceptable (see Box [23b](#)) (Schmidt, Asch and Halpern, 2012).

Providing flexible incentives, particularly as cash, gives recipients more choice over how they use incentive payments and may be preferred by recipients (Schmidt, Gerber and Stock, 2009). However, shopping vouchers were viewed as more acceptable to both the general public and those practitioners involved in helping disadvantaged smokers quit delivering interventions (Bonevski, Bryant and Paul, 2011, Mhurchu et al., 2011), as they provide some control on recipients' spending. Similarly, there were arguments in included papers favouring both incentives for process behaviours (e.g. attending behaviour change sessions) and for behavioural outcomes (e.g. smoking cessation) (Robison, 1998, Schmidt, Asch and Halpern, 2012, Volpp et al., 2009). These contrasting opinions likely reflect the varying population groups in which acceptability of HPFI was explored (see Box [23c](#)).

Theme 3: Effectiveness and cost-effectiveness of HPFI

There was strong consensus that if HPFI have been demonstrated to be effective and cost-effective (Volpp et al., 2009), they are more likely to be acceptable. One included empirical paper confirmed this relationship between effectiveness and acceptability, reporting that the acceptability of hypothetical HPFI to members of the public increased as stated effectiveness increased (see Box [34a](#)) (Promberger, Dolan and Marteau, 2012).

In contrast, some arguments in favour of cost-effectiveness were highly simplistic. For example, one author argued that HPFI do not incur financial costs to providers until behaviour change has

occurred. This ignores the costs of, for example, front line staff introducing and explaining programmes to participants (Giles et al., 2014, Johnston and Sniehotta, 2010). There is growing evidence that HPFI can be as effective as other behaviour change strategies (Cahill and Perera, 2008, Giles et al., 2014, Kane et al., 2004, Kavanagh, Stansfield and Thomas, 2009), but little evidence for cost-effectiveness has been published (see Box 34b).

A common criticism of HPFI was that they offer only short term motivation. Additionally, external motivators are argued to reduce internal motivation for change, hence offering limited support for long term change once HPFIs are removed (Robison, 1998). Some authors argue that these issues are inherent limiters of effectiveness and hence acceptability. Others argue that this only means HPFI need to be used within the context of a wider behaviour change and maintenance programme (see Box 34c).

Theme 4: Recipients of HPFI

Pregnant women and disadvantaged groups were generally thought of as appropriate, or deserving, groups for HPFI. However, more vulnerable groups were also identified as at most risk of being coerced into behaviour change by HPFI. There was a consistent finding that individuals currently engaging in behaviours identified as potential targets for HPFI rated incentives as more acceptable than those who did not stand to gain immediately from HPFI (see Box 45a).

One paper argued that American drug and alcohol clinicians are more accepting of HPFI than Britons or Australians because of relevant international differences in the transactional nature of healthcare provision (see Box 45b) (Ritter and Cameron, 2007).

Some concern was raised with providing cash incentives to help control substance misuse in particular—as rewards could be used to fund the very behaviour it is designed to prevent (Roozen, 2009). In practice, programmes circumvent this by providing vouchers that can be exchanged for a limited range of goods and services, rather than cash, and this likely influences why vouchers tend to be considered more acceptable to both the public and drug and alcohol

[practitioners](#) (see Box [45c](#)) (Cameron and Ritter, 2007, Oliver and Brown, 2012, Parke et al., 2013, Petry, 2010).

Theme 5: Impact of HPFI on individuals and wider society

Some authors argued that HPFI can encourage individuals to take responsibility for themselves, thereby promoting autonomy (Marteau, Ashcroft and Oliver, 2009). This assumes that all individuals wish to pursue healthy behaviours, and all that holds them back is the absence of a short term reward (see Box [56a](#)). The large number of other barriers to healthy behaviours that have been identified, suggests that this is simplistic (Axtell-Thompson, 2012). In contrast, some authors argued that HPFI are paternalistic and undermine individual autonomy by placing undue emphasis on bringing one's behaviour into line with that deemed acceptable by providers of HPFI (see Box [56b](#)) (Halpern, Madison and Volpp, 2009, Marteau, Ashcroft and Oliver, 2009).

Some commentators raised the possibility that HPFI may provide perverse incentives to engage in unhealthy behaviours or encourage individuals to 'game the system' (Aveyard and Bauld, 2011, Axtell-Thompson, 2012). Although there is some evidence from Honduras (Lagarde, Haines and Palmer, 2007) that the introduction of HPFI associated with a number of 'well child' behaviours was associated with an increase in the fertility rate, documented accounts of widespread 'gaming the system' are rare (see Box [56c](#)).

The potential for a perpetuating cycle of personal failure was also discussed. Lack of success in behaviour change, emphasised by failure to gain a reward, may lead to demotivation and even greater difficulty in future attempts at behaviour change.

Some authors proposed that HPFI offer the potential to enhance community spirit by providing opportunities to engage in collective action to reduce the negative impacts of individual lifestyle choices and behaviours (Ashcroft, Marteau and Oliver, 2008). Alongside the perception that HPFI are particularly attractive to more disadvantaged individuals, this is suggested as a potential mechanism for decreasing socio-economic inequalities in health (see Box [65d](#)) (Voigt, 2012). In contrast, other authors argued that, as barriers to change are fewer in more advantaged communities, HPFI may be most effective in these groups and so exacerbate health inequalities

(Oliver, 2009). There is growing evidence that a range of public health and health care interventions that rely on voluntary behaviour change are more effective in more affluent groups leading to a widening of inequalities (see Box 56e) (Capewell and Graham, 2010, White, Adams and Heywood, 2009).

DISCUSSION

Statement of principal findings

This is the first systematic review to focus on the acceptability of HPFI that we are aware of. Of 54-81 papers that met the inclusion criteria, less than a third presented empirical data. Most empirical studies involved surveys of the public. In-depth qualitative work and studies across a range of stakeholders were rare or absent.

Issues concerning acceptability of HPFI fell into five themes: 1) fair exchange, 2) design and delivery, 3) effectiveness and cost-effectiveness, 4) recipients, and 5) impact on individuals and wider society. Throughout, there were contradictions in included papers, however, there was a strong underlying consensus that if HPFI are shown to be effective and cost-effective then they are likely to be considered acceptable, but other factors also influenced acceptability - not always in a predictable way. A lack of relevant data meant we were not able to come to any clear conclusions on whether acceptability varied according to the nature of the behaviour incentivised or the population rating acceptability.

Strength and weaknesses of included work

Despite finding 54 papers that met the inclusion criteria, less than one third of these (n=14) reported empirical evidence (Arterburn D, 2008, Bonevski B, 2011, Bonevski B, 2012, Cameron J, 2007, Ducharme LJ, 2010, Kim A, 2011, Long JA, 2008, Lynagh M, 2011, Mantzari E, 2012, Mhurchu CN, 2012, Park JD, 2012, Parke H, 2011, Promberger M and Marteau, 2011, Promberger M, 2012, Ritter A, 2007). The majority of empirical papers included in the review (n=12) (Arterburn D, 2008, Bonevski B, 2011, Bonevski B, 2012, Ducharme LJ, 2010, Kim A, 2011, Lynagh M, 2011, Mhurchu CN, 2012, Park JD, 2012, Promberger M and Marteau, 2011, Promberger M, 2012, Ritter A, 2007, Long JA, 2008) used a quantitative (or mixed qualitative/quantitative) approach, meaning that larger samples (largely using convenience

sampling) were included, but depth of opinion was lacking. Acceptability is a complex phenomenon and it is likely that more in-depth, qualitative research will shed more light on these complexities than survey-based quantitative research.

Although more general discussion of the acceptability of HPFI was provided in the [40-59](#) pieces of scholarly writing (~~Ashcroft, 2011, Ashcroft RE, 2008, Aveyard P, 2011, Donatelle RJ, 2004, E., 2008, RW., 2002, RW., 2006, Halpern SD, 2009, RH., 2010, J., 2008, JN., 2006, Klein E, 2010, E., 2006, MW., 2008, London AJ and Network, 2012, Luyten J, 2011, Madison KM, 2011, Malone SW, 1990, Marteau T, 2009, MP., 2012, A., 2009, Oliver A, 2012, Pearson SD, 2009, R., 2008, H., 2008, H., 2012, Schmidt H, 2009a, Terry PE, 2011, K., 2012, Volpp KG, 2011, Wu, 2012, NM., 2010, HG, 2009, L, 2012, R, 2012, Robison, 1998, Schmidt G, 2012, Schmidt H, 2009b, Volpp et al., 2009, Blumenthal Barby JS, 2012~~), few of these drew consistently on the empirical papers (see Figure 3) meaning that this scholarly critique was not always evidence-informed. However, some of these pieces of scholarly writing were published in high profile empirical journals and are likely to have been widely read, and considered to be grounded in empirical evidence. Although empirical data is not the only source of knowledge, nor did scholarly writing tend to be in-depth philosophical or ethical debates. As such, we felt the level of consideration of acceptability of HPFI across all included papers lacked depth.

Whilst quality appraisal was undertaken for the empirical papers, this was not possible for the scholarly writing as no relevant tool could be located. Formal quality appraisal identified that qualitative components of empirical studies tended to be medium or high quality. Quantitative components were mostly poor in terms of representativeness and generalisability of the sample, justification of sample size and reliability and validity of tools. In some ways this reflects the nature of the work included in the review – acceptability is a subjective concept and criterion validity of tools is hard to confirm. ~~The fact that many quantitative studies used the same tool for measuring acceptability increases comparability between studies.~~

There is a dearth of empirical work on the acceptability of HPFI, —particularly the specifics of when HPFI are and are not acceptable ~~and~~ from the perspective of a range of stakeholders. Whilst views from members of the public were explored in [107](#) of the [14-22](#) empirical papers,

only a minority focused on the views of health practitioners and organisations tackling health behaviours (n=4). ~~No attempt was made in any papers to explore whether and how acceptability varied according to socio-demographic characteristics of members of the public.~~ Scholarly writing tended to explore acceptability from the perspective of the general public, or from a non-specific viewpoint, where the specifics of 'for whom' acceptability was being considered was not clear. No attempt was made in any included papers to explore whether and how acceptability varied according to socio-demographic characteristics of members of the public. If HPFI are to be targeted to particular population groups, then understanding which groups might find them most acceptable would be valuable. Similarly, a wide variety of stakeholders are likely to be involved in commissioning, design and delivery of any HPFI, and understanding acceptability in these groups would help with smooth implementation (Craig et al., 2008).

Empirical research was also undertaken in a narrow range of countries, with the main settings being the UK (n=72), USA (n=75), UK and USA (n=1), Australia (n=5), The Netherlands (n=1) and New Zealand (n=1). Whilst it has been suggested that acceptability may vary internationally, and be related to differences in how health care is currently funded (Ritter A, 2007), there is little empirical evidence to support this conclusion. Further work exploring this would be valuable to help policy makers and practitioners understand if acceptability data is generalisable or not across countries. Finally, the disciplines of those undertaking the empirical research were fairly narrow, being public health (n=97), medicine and psychology (n=115), and social science and sociology (n=2). Individuals from some disciplinary backgrounds may be more sympathetic to HPFI than others, but it was not possible to explore this.

Strengths and weaknesses of this review

We believe that all papers meeting the inclusion criteria were identified. Three papers that were included at the title and abstract stage could not be located and so were excluded from the review (Botelho, 2012, McCormack, 1996, Tuten et al., 2012). Nonetheless, we feel that data saturation was achieved. Using thematic analysis gave greater flexibility allowing themes to emerge from the data. The lack of an a-priori theoretical framework is, however, considered a disadvantage of thematic analysis by some (Braun and Clarke, 2006).

A wide range of arguments and counterarguments were found in relation to the acceptability of HPFI. The heterogeneity and contradictions in the included papers highlights the contested nature of HPFI. Whilst we were able to identify some aspects of HPFI that influence acceptability, the exact nature of an ‘acceptable’ HPFI is not clear and appears to be context-specific.

Including both quantitative and qualitative empirical work in the same systematic review is unusual. It is particularly rare to include non-empirical work in a systematic review. As such, there was little in the way of guidance available to us to help guide our review. We drew on aspects of standard systematic reviewing methodology (Petticrew and Roberts, 2005, The Cochrane Collaboration, 2011), as well as meta-ethnography in developing our methods (Britten et al., 2002, Noblit, Hare and Van Maanen, 1988). Whilst we believe we have conducted a rigorous and thorough review, other approaches may have been equally appropriate.

In conducting this review, we adopted the perspective that both empirical findings and scholarly writing were equally valid. Although we found it interesting that scholarly writing did not appear to draw strongly from empirical findings, empirical research is not the only source of knowledge. Multidisciplinary approaches are required to gain a holistic appreciation of the complexity of acceptability of HPFI.

Interpretation of findings and implications for policy, practice and research

We found a variety of issues surrounding acceptability of HPFI relating to fair exchange, design and delivery, effectiveness and cost-effectiveness, recipients, and impact on individuals and wider society. However, disagreements in the literature exist in all areas. The one consistent finding was that demonstrated effectiveness and cost-effectiveness are key determinants of acceptability.

Although HPFI are sometimes viewed as more contentious than other health behaviour change interventions, the requirement that an intervention must be effective and cost-effective to be acceptable is likely to be universal. As there is growing evidence of effectiveness of HPFI (Cahill and Perera, 2008, Giles et al., 2014, Kane et al., 2004, Kavanagh, Stansfield and Thomas,

2009, Paul-Ebhohimhen and Avenell, 2008, Wall et al., 2006), this finding also suggests that better communication of the existing effectiveness evidence to all relevant stakeholders could increase the acceptability of HPFI. Further work is required to determine the best methods of communicating this evidence. Future empirical research on the long term effectiveness of HPFI, and whether they undermine intrinsic motivation, would also be helpful to respond to concerns in these areas (Thomson et al., 2014).

Given the lack of qualitative data we found, it is difficult to get a clear idea of the depth and strength of feeling towards HPFI. Similarly there remains little evidence on the particular types, format, size, and scheduling of financial incentives, which are most acceptable (Cahill and Perera, 2008, Giles et al., 2014, Kane et al., 2004, Kavanagh, Stansfield and Thomas, 2009, Paul-Ebhohimhen and Avenell, 2008, Wall et al., 2006). Future work would benefit from adopting qualitative approaches to explore acceptability in-depth with the public, practitioners who may be involved in delivering HPFI, and policy makers who may have to defend their implementation. In addition, large scale quantitative surveys with population-representative samples would help determine if certain socio-demographic characteristics are associated with the acceptability of HPFI.

CONCLUSION

The available evidence suggests that HPFI are acceptable when they are considered effective and cost-effective; if they provide benefits to individual recipients and wider society; when they are considered fair; and when they are delivered to individuals who are deemed acceptable

recipients. Other factors also influenced acceptability, but not always in a predictable way

Disagreement exists in relation to the specific aspects of these issues that make HPFI acceptable.

Further research is required to explore acceptability across a wider range of stakeholders, and how acceptability varies according to the nature of HPFI interventions and the populations rating acceptability. Studies using both in-depth qualitative methods, and quantitative survey methods in population-representative cohorts, are required to address these gaps.

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CONFLICT OF INTEREST STATEMENT

The authors declare that there are no conflicts of interest. The study sponsor did not have a role in the study design; collection, analysis, and interpretation of data; writing the report; and the decision to submit the report for publication.

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FIGURE LEGENDS

Figure 1 PRISMA flow diagram

Figure 2 Quality assessment of qualitative empirical papers

Figure 3 Citation mapping – cited by another included paper

SUPPLEMENTARY MATERIALS TABLE LEGENDS

Table S1 Summary of aims, methods and participants in empirical studies included in the review

Table S2 Summary of scholarly writing included in the review

Table S3 Quality assessment of quantitative empirical papers

Box S1 Medline search strategy

Box S2-1 Quotations to illustrate the ‘Fair exchange’ theme

Box S3-2 Quotations to illustrate the ‘Design and delivery of HPFI’ theme

Box S4-3 Quotations to illustrate the ‘Effectiveness and cost-effectiveness’ theme

Box S5-4 Quotations to illustrate the ‘Recipients of HPFI’ theme

Box S6-5 Quotations to illustrate the ‘Impact of HPFI on individuals and wider society’ theme

Appendix A Completed PRISMA checklist

Appendix B Medline search strategy