



Review Article

Acceptability of financial incentives for health-related behavior change: An updated systematic review



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ABSTRACT

Despite the successes of financial incentives in increasing uptake of evidence-based interventions, acceptability is polarized. Given widespread interest in the use of financial incentives, we update findings from Giles and colleagues' 2015 systematic review (n = 81). The objectives of this systematic review are to identify what is known about financial incentives directed to patients for health-related behavior change, assess how acceptability varies, and address which aspects and features of financial incentives are potentially acceptable and not acceptable, and why.

PRISMA guidelines were used for searching peer-reviewed journals across 10 electronic databases. We included empirical and non-empirical papers published between 1/1/14 and 6/1/18. After removal of duplicates, abstract screening, and full-text reviews, 47 papers (n = 31 empirical, n = 16 scholarly) met inclusion criteria. We assessed empirical papers for risk of bias and conducted a content analysis of extracted data to synthesize key findings.

Five themes related to acceptability emerged from the data: fairness, messaging, character, liberty, and tradeoffs. The wide range of stakeholders generally preferred rewards over penalties, vouchers over cash, smaller values over large, and certain rewards over lotteries. Deposits were viewed unfavorably. Findings were mixed on acceptability of targeting specific populations. Breastfeeding, medication adherence, smoking cessation, and vaccination presented as more complicated incentive targets than physical activity, weight loss, and self-management.

As researchers, clinicians, and policymakers explore the use of financial incentives for challenging health behaviors, additional research is needed to understand how acceptability influences uptake and ultimately health outcomes.

1. Introduction

Behavioral choices influence health outcomes: modifiable individual behavioral patterns account for > 350,000 premature deaths annually in the United States (McGinnis et al., 2002). Comprehensive behavior change strategies are needed across the lifespan (Mokdad et al., 2018). Financial rewards and penalties are one strategy for addressing health behaviors that are difficult to modify. Individuals are generally present-biased, regret- and loss-averse, and ascribe unduly high weights to low probability events. Appropriately structured financial incentives may overcome these biases by offsetting the certain

and immediate opportunity costs of behavior change, as well as uncertain and delayed gains (Haff et al., 2015).

A 2014 systematic review and meta-analysis including 16 studies found that financial incentives were 1.5 to 2.5 times more effective for promoting healthy behaviors than no intervention or usual care (Giles et al., 2014). In addition, a 2015 meta-analysis including 11 randomized controlled trials found that financial incentives designed using concepts from behavioral economics were effective for promoting health-related behavior change (Haff et al., 2015). Another 2015 systematic review and meta-analysis also demonstrated that financial incentives can change health behaviors (Mantzari et al., 2015). Behaviors

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captured in these analyses include smoking cessation, vaccination or screening, physical activity, healthier eating, weight loss, and medication adherence. Furthermore, a 2015 Cochrane review on incentives for smoking cessation found improved cessation rates in pregnant smokers, both at end-of-pregnancy and postpartum (Cahill et al., 2015).

Despite the successes of financial incentives in increasing uptake of evidence-based interventions, acceptability of incentives is polarized (Giles et al., 2015a). Within the field of implementation science, acceptability is defined as “perception among implementation stakeholders that a given treatment, service, practice, or innovation is agreeable, palatable, or satisfactory” (p. 67) (Proctor et al., 2011). Acceptability as an implementation outcome must be considered in both the design and implementation of health care interventions. If stakeholders find incentive programs unacceptable, delivery and uptake inevitably will be poor (Bigsby et al., 2017; Giles et al., 2016a).

In a 2015 systematic review on acceptability of financial incentives for health-related behavior change that included papers from 12 databases from the earliest date available until 1 October 2014, Giles and colleagues found that financial incentives were acceptable when they were effective and cost-effective, though numerous other factors influenced acceptability, including characteristics of recipients, perceived fair exchange, incentive design and delivery, and impact on individuals and wider society (Giles et al., 2015a). The review called for further research to examine acceptability across a broader range of stakeholders and explore variation by incentive type (Giles et al., 2015a).

Interest in incentive-based interventions has continued since Giles et al.'s review (Giles et al., 2015a), particularly in U.S. Medicaid beneficiary programs and employee wellness programs (Garfield et al., 2018; Mattke et al., 2014).

Given mixed findings on acceptability among the public, policymakers, and health care professionals and the continued expansion of incentive programs, further exploration of diverse viewpoints is important to inform program design and implementation. This review aims to update the findings from Giles et al. (2015a) through an implementation science lens by detailing the range of stakeholders assessing acceptability, their sociodemographic characteristics, the behaviors incentivized, and modifiable financial incentive design features. We add a nuanced description of current thematic content characterizing acceptability. Following Giles et al.'s protocol, we define financial incentives as “direct individual level interventions that offer cash or cash-like (e.g. vouchers) rewards contingent on performance of the target healthy behavior,” and “interventions imposing cash or cash-like (e.g., reductions in benefits) penalties contingent on non-performance of the target healthy behavior” (Emma Giles, PhD, email communication, 24 May 2018). “Stakeholders” refer to members of the general public, policymakers, health care professionals, and patients. This review addresses the following research questions:

1. What is known about acceptability of financial incentives for health-related behavior change?
2. What methods have been used to determine acceptability of financial incentives?
3. For which stakeholders has acceptability of financial incentives been explored?
4. How does acceptability vary according to the a) nature of the behavior incentivized, b) sociodemographic characteristics of recipients, c) format of the incentive, and d) population rating acceptability (e.g., potential recipients, members of general public, policymakers, clinicians)?
5. Which aspects and features of financial incentives have been identified as potentially acceptable and not acceptable, and why (Giles et al., 2015a)?

2. Methods

2.1. Protocol and registration

This review is reported following Preferred Reporting Items for Systematic Reviews (PRISMA) guidelines (Moher et al., 2009). We made minor changes to the original study's protocol.

2.2. Eligibility criteria

Included papers met the following criteria: published between 1 January 2014 and 1 June 2018; English language title; published in a peer-reviewed journal; and explored acceptability of incentives for health-related behaviors from perspectives of the general public, potential recipients, health care professionals, and/or policymakers. Only papers exploring acceptability of financial incentives directed to adults (age 18 years or older) living in high income countries (those with a Gross National Income of \$12,276 or more per capita in 2010, per the World Bank) were included (Giles et al., 2015a). This criterion limited the scope given the large body of literature specific to conditional cash transfers in developing countries. We broadly interpreted health-related behaviors to include smoking cessation, decrease in harmful drinking, increase in physical activity, attendance for screening or vaccination, breastfeeding, medication adherence, and self-management (the original review did not include the last 3 behaviors). Empirical studies were defined as articles reporting primary data through either quantitative or qualitative approaches. Scholarly writing – such as essays, editorials, or commentaries – provided an appraisal of acceptability or concerns related to the use of incentives (Giles et al., 2015a).

2.3. Information sources and search

We searched 10 electronic databases (Appendix 1) for primary empirical research and scholarly writing that explored acceptability of financial incentives. The lead author carried out the full original search strategy in Medline from Giles et al.'s original study (Giles et al., 2015a), then adapted the search for other databases. All included papers used the terms “acceptable,” “accept,” “ethics,” “moral,” or a variant thereof; also included were variations of “financial incentives” AND “acceptability” OR “ethics,” as well as “contingency management” and “penalty.” The lead author hand-searched the reference lists of included papers. A second reviewer checked the inclusion/exclusion criteria of a 10% random sample of the total abstracts found with the search terms.

2.4. Study selection

The original database search yielded 2176 results. We screened titles and abstracts to remove duplicates (n = 207) and studies not relevant to the topic (n = 1898). The full text of remaining articles (n = 71) was reviewed. Forty-three articles met the inclusion criteria. An additional 4 articles were identified (Fig. 1).

2.5. Data collection processes and items

From the 47 articles meeting inclusion criteria, we abstracted the following acceptability-related content: participant characteristics, setting/country, time period, nature of incentivized behavior, format of incentive, study design, results, and aspects of financial incentives considered acceptable or unacceptable. For the scholarly papers, study design and results did not apply.

2.6. Risk of bias in individual studies

The quality of observational, cross-sectional, and randomized controlled trial studies was assessed with the National Heart, Lung, and

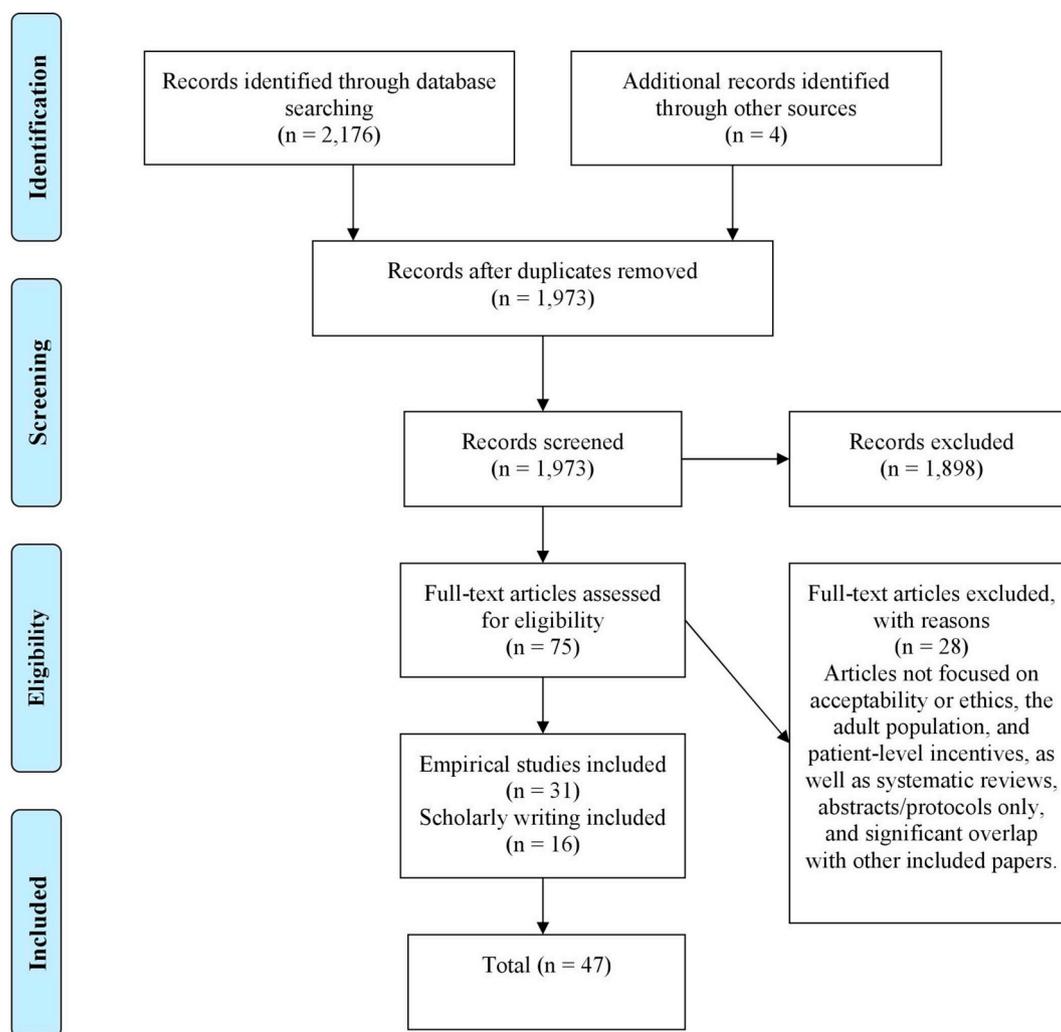


Fig. 1. PRISMA flow diagram.

Blood Institute (NHLBI) Quality Assessment Tools ([National Heart L, and Blood Institute, n.d.](#)). The discrete choice experiments (DCEs) were assessed with the International Society for Pharmacoeconomics and Outcomes Research (ISPOR) conjoint analysis checklist ([Wortley et al., 2014; Bridges et al., 2011](#)). Qualitative studies were appraised with the Consolidated Criteria for Reporting Qualitative Research (COREQ) checklist ([Tong et al., 2007; Paidipati et al., 2017; Mooney-Doyle et al., 2015](#)). Both NHLBI and COREQ tools were used for mixed methods studies. Quality of scholarly papers was not assessed. The lead author screened all studies, and a second reviewer double-checked a 20% sample ($n = 9$) to ensure accuracy; disagreements were resolved by consensus. We included all papers in the analysis given the 1) diversity of included papers and 2) decision not to conduct a meta-analysis due to methodological heterogeneity ([Giles et al., 2015a](#)).

2.7. Synthesis of results and additional analyses

We organized the extracted data related to acceptability in tabular form specific to each research question to generate specific counts. To synthesize the findings from both empirical and scholarly papers, codes were inductively derived directly from the extracted data; while we were familiar with the original study's themes, this approach allowed for a new interpretation of the data. The lead author completed a content analysis of the extracted data by first deriving codes to capture key concepts ([Hsieh and Shannon, 2005](#)). The codes were iteratively compared, sorted into 11 categories based on linkages, and clustered by

emergent categories into key themes, which were further refined and described as frictions (i.e., dissenting or discordant perspectives). The lead author then returned to the original extracted data for verification ([Hsieh and Shannon, 2005; Whittemore and Knafel, 2005](#)). This process of iterative comparisons clarified the empirical and theoretical support of our interpretation ([Whittemore and Knafel, 2005](#)).

3. Results

3.1. Study selection

[Tables 1 and 2](#) summarize the included studies. Of the 2176 de-duplicated studies, 47 papers met inclusion criteria and are included in the synthesis of results. Two papers ([Hoddinott et al., 2014; Volpp and Galvin, 2014](#)) overlap the original study, as [Giles et al. \(2015a\)](#) included papers up to 1 October 2014 and our search started with 1 January 2014. Of the included papers, 31 are empirical studies ([Biggsby et al., 2017; Giles et al., 2016a; Hoddinott et al., 2014; Anderson et al., 2017; Becker et al., 2018; Berg et al., 2014; Berlin et al., 2018; Blondon et al., 2014; Blondon, 2015; Crossland et al., 2015; Dallery et al., 2017; Flynn et al., 2017; Giles et al., 2016b; Giles et al., 2015b; Giles et al., 2015c; Greene et al., 2017; Hartzler and Garrett, 2016; Johnson et al., 2018; Marti et al., 2017; McGill et al., 2018; McNaughton et al., 2016; Mitchell et al., 2014; Noordraven et al., 2017; Priebe et al., 2016; Pullen et al., 2018; Thomson et al., 2014; Wadge et al., 2015; Wen et al., 2016; Whelan et al., 2018; Whelan et al., 2014; Liu et al., 2017](#)) and 16 are

Table 1
Summary of empirical studies included in the review and quality ratings.

Paper	Country	Aim	Design	Participants (n)	Acceptability evaluation method	Results	Quality rating ^a
Anderson et al. (2017)	U.S.	To obtain the perspectives of health care providers and clinic staff on the implementation of a financial incentive program	<ul style="list-style-type: none"> Qualitative Individual interviews with thematic analysis 	HIV subspecialty clinic providers and staff members (n = 27) who implemented the Health Models financial incentive program in Louisiana	Key themes	Most clinic staff believed that the Health Models incentive program helped improve HIV care by providing low-income patients with financial assistance, improving appointment keeping, increasing patient engagement, and incentivizing the development of new habits of HIV treatment and preventive care. Participants had a strong preference for higher values paid as an incentive. Cash transfers and high street vouchers were equally preferable, while gift pack was more and vouchers for local shops were less preferred compared to cash transfer. Participants preferred longer breastfeeding duration of 6 weeks rather than 2 days, while a breastfeeding duration of 10 days was least preferred.	Fair
Becker et al. (2018)	U.K.	To establish women's relative preferences for different aspects of a financial incentive scheme for breastfeeding and to identify importance of scheme characteristics on probability of participation in an incentive scheme	<ul style="list-style-type: none"> Quantitative Mailed discrete choice experiment 	Women in the South Yorkshire Cohort aged 16–45 in Index of Multiple Deprivation quintiles 3–5 (n = 562)	Marginal utility value	Participants had a strong preference for higher values paid as an incentive. Cash transfers and high street vouchers were equally preferable, while gift pack was more and vouchers for local shops were less preferred compared to cash transfer. Participants preferred longer breastfeeding duration of 6 weeks rather than 2 days, while a breastfeeding duration of 10 days was least preferred.	Good
Berg et al. (2014)	U.S.	To examine the feasibility, acceptability, and potential effectiveness of an online intervention targeting college smokers	<ul style="list-style-type: none"> Quantitative Randomized controlled trial with online survey 	Adult college smokers (n = 122)	0–4 scale with higher rating for more favorable attitude	Intervention achieved greater adherence and utilization. Intervention participants less frequently attempted to quit but smoked fewer cigarettes/day. Both groups demonstrated significant end of treatment cessation rates. 42.6% participants reported that deals had influence on their program engagement, and 33.3% reported that deals influenced their health behaviors.	Good
Berlin et al. (2018)	U.K./France	To assess acceptability of financial incentives to reward pregnant smokers who stop smoking using a survey conducted in the UK and then subsequently in France	<ul style="list-style-type: none"> Quantitative In-person and telephone cross-sectional survey 	Nationally representative British (n = 1144) and French samples (n = 1254)	Categorical variables on 5-point Likert scale	More French than British respondents agreed with financial incentives for rewarding quitting smoking during pregnancy, not smoking after delivery, keeping a smoke-free household, health service payment for meeting target and the maximum amount of the reward. More British than French respondents were neutral toward incentives. About 45% of both groups thought that incentives should only be offered to low-income women rather than to all pregnant smokers, with British answers more skewed to lower amounts.	Good
Bigsby et al. (2017)	U.S.	To examine the individual factors in a US nationally representative sample related to acceptability of incentives differing in terms of funding and targeted health behavior	<ul style="list-style-type: none"> Quantitative Online cross-sectional survey 	Representative U.S. sample (n = 526)	Semantic differential word pairs averaged to create a 1–5 scale and constant-sum comparison technique for mean allocation amounts	Private funding predicted higher funding allocation for health incentives. Those in smoking cessation condition had significantly more negative attitudes than those who read about colonoscopy incentives. Liberal	Good

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Table 1 (continued)

Paper	Country	Aim	Design	Participants (n)	Acceptability evaluation method	Results	Quality rating ^a
Blondon (2015)	U.S.	To study acceptability of incentives for behavior changes in individuals with diabetes, comparing financial incentives to self-rewards and non-financial incentives	<ul style="list-style-type: none"> Quantitative Online cross-sectional survey 	Adults with diabetes (n = 153)	4-point scale to estimate perceived helpfulness of rewards	ideology was associated with more positive attitudes and increased incentive funding. Race "Other" had less favorable attitudes than non-Hispanic White participants. 96% of individuals were interested in financial incentives, 60% in non-financial incentives, and 72% in self-rewards. Participants did not expect to need large amounts to motivate them to modify behavior. Individuals were optimistic about the effectiveness of incentives.	Fair
Blondon et al. (2014)	U.S.	To improve understanding of the potential of incentives to enhance diabetes self-management	<ul style="list-style-type: none"> Qualitative Individual interviews with patients and providers 	Patients with Type 1 or 2 diabetes mellitus (n = 12), providers (primary care practitioners, diabetes specialists, ophthalmologist, psychiatrist, n = 9)	Key themes, counts	10/12 participants with diabetes were interested in using financial incentives to improve diabetes self-management. Participants preferred tracking processes rather than outcomes.	Fair
Crossland et al. (2015)	U.K.	To develop a typology of incentives and their meanings for initiating and sustaining smoking cessation in pregnancy and breastfeeding	<ul style="list-style-type: none"> Mixed method synthesis Individual interviews and focus groups plus secondary data from 2 systematic reviews 	Pregnant women, recent mothers, and family members (n = 88); providers (n = 53); experts (n = 24); conference attendees (n = 63)	Typology of incentive categories and meanings understood in 3 dimensions	Incentive categories included cash and shopping vouchers, maternal wellbeing, baby and pregnancy-related, behavior-related, health-related, general utility, awards and certificates, experiences. Typology included degree of restriction, extent to which each is hedonic and/or utilitarian, whether each has solely monetary value versus monetary with added social value.	N/A
Dallery et al. (2017)	U.S.	To examine the feasibility, acceptability, and potential effectiveness of an online intervention targeting college smokers	<ul style="list-style-type: none"> Quantitative Randomized controlled trial with questionnaire 	Adult smokers from 26 states (n = 94)	Questionnaire: 0-100 visual analog scale	The contingency management/financial incentive program delivered via internet improved short-term abstinence rates compared with an internet program without the incentives. Lowest acceptability ratings were for items assessing the deposit, whereas the highest ratings concerned the ease of the intervention, the graph of CO results, and earning money.	Good
Flynn et al. (2017)	U.K.	To establish preferences of parents and guardians of preschool children for the organization of preschool vaccination services, including financial incentives	<ul style="list-style-type: none"> Quantitative Online discrete choice experiment 	Parents/guardians of preschool children (up to age 5) who were classified as at high risk of incompletely vaccinating their children (n = 259) and were not (n = 262)	Willingness to accept (WTA), willingness to wait (WTW)	No difference in preference for parental financial incentives compared to no incentive in parents "not at high risk" of incomplete vaccination. In "high risk" group, there was no difference in preference for voucher compared to no rewards. Both groups preferred universally available, rather than targeted, vaccinations, with stronger negative preference in "at high risk" group.	Good
Giles et al. (2015a)	U.K.	To examine opinion toward financial incentives for breastfeeding using reader responses to U.K. online media	<ul style="list-style-type: none"> Qualitative Netnography with online data content and thematic analysis 	Reader comments (n = 3375) in response to 13 articles	Key themes	Key themes were 1) children are a lifestyle choice; 2) financial incentives for breastfeeding are discriminatory	N/A

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Table 1 (continued)

Paper	Country	Aim	Design	Participants (n)	Acceptability evaluation method	Results	Quality rating ^a
Giles et al. (2015b)	U.K.	To gain in-depth insight into the factors related to acceptability of health promoting financial incentives and preferred formats for incentives coverage of a study undertaken in the area	<ul style="list-style-type: none"> Qualitative Focus group methodology with thematic analysis 	Adults in Newcastle upon Tyne, UK (n = 74, in 8 focus groups)	Key themes	and divisive; 3) creating a culture of entitlement; 4) financial incentives for breastfeeding are personally insulting; 5) psychological impact on recipients; 6) effectiveness and cost-effectiveness; 7) generating initial motivation; 8) design and delivery; and 9) informed choice. Key themes: 1) Nature of fair exchange; 2) demonstration as effective and cost-effective before incentives are implemented wholesale; 3) certain individuals, such as pregnant women and low-income groups, are viewed as more acceptable recipients of incentives; 4) incentives can have positive impacts on individuals and wider society; and 5) incentives should be designed and delivered in a way which is less open to abuse (e.g., vouchers) and be tailored to individuals.	Good
Giles et al. (2016a)	U.K.	To determine the relative preferences of U.K. adults for attributes of financial incentives for healthy behaviors and to determine whether preferences vary according to the respondents' socio-demographic characteristics	<ul style="list-style-type: none"> Quantitative Online discrete choice experiment 	Adults living in the UK (n = 356)	Marginal utility value	In majority of cases, cash or vouchers were considered equally preferable to no incentive (with exception of a significant preference for cash compared to no incentive for vaccination attendance), with consistent preference for no financial incentive compared to lottery ticket. Preferences for financial incentives were inversely related to incentive value. Participants preferred incentives available to everyone rather than targeted only at pregnant women or people living in low-income housing.	Good
Giles et al. (2016b)	U.K.	To explore the views of public health policymakers on whether or not financial incentives are acceptable, and what, if anything, could be done to maximize acceptability of financial incentives	<ul style="list-style-type: none"> Qualitative Individual interviews with framework analysis 	Local, regional, and national English policymakers (n = 21)	Key themes	Participants had concerns about effectiveness and cost-effectiveness, potential "gaming," and whether or not financial incentives address the underlying cause of unhealthy behaviors. Shopping vouchers of smaller value targeted at deprived groups were particularly acceptable. Participants were concerned about responses of other stakeholders to incentives, including the public, potential recipients, politicians, and the media.	Good
Greene et al. (2017)	U.S.	To determine acceptability of the financial incentive in the TIC-PLUS study among those receiving and implementing the intervention	<ul style="list-style-type: none"> Qualitative Focus group methodology and individual interviews with thematic analysis 	Patients (age 14–72, n = 72) with HIV, study investigators (n = 12), and study site staff members (n = 12)	Key themes	Five main acceptability influencers were emotional benefits, financial benefits, health-related benefits, philosophical concerns, and	Fair

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Table 1 (continued)

Paper	Country	Aim	Design	Participants (n)	Acceptability evaluation method	Results	Quality rating ^a
Hartzler and Garrett (2016)	U.S.	To document interest in incentives and preferences for fixed-ratio vs. variable-ratio and immediate vs. distal distribution of earned incentives among clients enrolled at three community programs affiliated with the National Institute on Drug Abuse Clinical Trials Network	<ul style="list-style-type: none"> Quantitative Self-administered cross-sectional survey 	Adults actively enrolled in substance use disorder treatment services (n = 358)	5-point scale to elicit ratings of interest	implementation issues (main challenges). High acceptability may be possible in the context of unknown effectiveness. The shared emotional benefit provides a new dimension to concept of “fair exchange.” Interest in different types of \$50 incentives was highly inter-correlated, with a mean sample rating of 3.49 on a 5-point scale. While consistent across gender, age was an inverse predictor of client interest in incentives. Majority stated preferences for fixed-ratio incentive magnitude and distal distribution (voiced by larger proportion of females). Agreement with incentives was mixed (34–46%) in the sample. Mean agreement score was highest for a free breast pump, and lowest for incentives for smoking abstinence after birth. More women disagreed with shopping vouchers than men. Those with lower levels of education disagreed more with smoking cessation incentives and a breast pump. Those aged ≤ 44 agreed more with all incentive strategies compared to those ≥ 65 years old. Non-white ethnic groups agreed particularly with breastfeeding incentives.	Good
Hoddinott et al. (2014)	U.K.	To survey public attitudes about incentives for smoking cessation in pregnancy and for breastfeeding to inform trial design	<ul style="list-style-type: none"> Quantitative In-person cross-sectional survey 	Representative British sample (n = 1144)	Categorical variables on 5-item Likert scale	Women were generally positive about the scheme. Vouchers were frequently described as a reward, bonus, something to look forward to, and help to keep going – often perceived as “compensation.” Scheme was not thought to influence mothers who were strongly against breastfeeding, with more impact on the decision to continue rather than to initiate breastfeeding. Physicians generally agreed with offering financial incentives to patients, and this belief did not change notably at the end of the study in most study groups. The majority of respondents stated that the RCT had no effect on their relationships with their patients. A few reported positive effects.	Good
Johnson et al. (2018)	U.K.	To explore experiences and perceptions of women eligible for the NOSH financial incentive scheme for breastfeeding during feasibility and trial phases	<ul style="list-style-type: none"> Qualitative 1. group interview and individual interviews with framework analysis 	Women eligible for the NOSH financial incentive scheme (n = 35)	Key themes	Women were generally positive about the scheme. Vouchers were frequently described as a reward, bonus, something to look forward to, and help to keep going – often perceived as “compensation.” Scheme was not thought to influence mothers who were strongly against breastfeeding, with more impact on the decision to continue rather than to initiate breastfeeding. Physicians generally agreed with offering financial incentives to patients, and this belief did not change notably at the end of the study in most study groups. The majority of respondents stated that the RCT had no effect on their relationships with their patients. A few reported positive effects.	Good
Liu et al. (2017)	U.S.	To assess how primary care providers (PCPs) perceived various components of a financial incentive program before and after participation	<ul style="list-style-type: none"> Multi-method Pre/post survey with individual interviews with content analysis 	PCPs participating in an incentive RCT for LDL reduction (n = 234 and n = 27 in quant and qual analyses respectively)	5-point scale to assess agreement with offering incentives, participant quotations	Physicians generally agreed with offering financial incentives to patients, and this belief did not change notably at the end of the study in most study groups. The majority of respondents stated that the RCT had no effect on their relationships with their patients. A few reported positive effects.	Fair/poor (quant/qual)
Marti et al. (2017)	U.S.	To investigate acceptability of financial incentives for initiating a medically supervised benzodiazepine	<ul style="list-style-type: none"> Quantitative Mailed discrete choice experiment 	Adults age 50 or older with anxiety and at least 3 benzodiazepine	Coefficient from latent class model	All four program variables influenced stated preferences. Respondents strongly preferred guaranteed cash-	Good

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Table 1 (continued)

Paper	Country	Aim	Design	Participants (n)	Acceptability evaluation method	Results	Quality rating ^a
McGill et al. (2018)	Australia	discontinuation program among people with long-term benzodiazepine use and to identify program features that influence willingness to participate	<ul style="list-style-type: none"> Mixed method sequential (QUAL → quan) Online survey and focus group methodology with thematic analysis 	<p>prescriptions in the previous 12 months (n = 126)</p> <p>Adults who had completed a weight loss program (n = 130 survey, n = 28 in 6 focus groups)</p>	Binary variable on 5-item Likert scale, key themes	<p>based incentives as opposed to a lottery. The amount of both the starting and conditional incentives had a substantial impact on choice. Willingness to participate increased with the amount of conditional incentive. Participation also varied by gender, duration of use and income. More than half (56.9%) of survey respondents thought that financial incentives could be useful. Online survey respondents reported that non-cash (85.2%) and cash (77%) incentives would be potentially motivating, but only 40.5% reported that deposit contracts would motivate weight loss maintenance. Amount of needed money varied. Results of in-depth discussions found overall low support for any type of incentive, but especially deposit contracts and lotteries.</p>	Fair/fair (quan/qual)
McNaughton et al. (2016)	U.K.	To understand if financial incentives or quasi-mandatory schemes might be acceptable interventions to increase immunization uptake for preschool children	<ul style="list-style-type: none"> Qualitative Focus group methodology and individual interviews with framework analysis 	Parents (n = 91), health and other professionals (n = 18), and policymakers and commissioners (n = 6)	Key themes	<p>Parents and professionals felt that introducing financial incentives for immunization was inappropriate. Parents and professionals highlighted the positives of introducing quasi-mandatory schemes, stating these schemes felt natural, fair, and less likely to create inequality.</p>	Fair
Mitchell et al. (2014)	Canada	To explore acceptability of incentives among a sample of Canadian cardiac rehabilitation patients	<ul style="list-style-type: none"> Qualitative Focus group methodology with thematic analysis 	Canadian cardiac rehabilitation patients (n = 15 in 3 focus groups)	Key themes	<p>Three broad themes: 1) Ethical concerns (half participants disagreed with incentive approach); 2) ethical concerns mitigated in considering a range of incentive features, like type, size, source (privately-sponsored voucher-based incentives were highly acceptable); 3) if designed like this, then financial incentives were considered potentially effective in motivating behavior change and reducing economic barriers to exercise participation.</p>	Fair
Noordraven et al. (2017)	U.K.	To assess attitudes and ethical acceptability of patients and clinicians who participated in the Money for Medication (M4M) clinical trial	<ul style="list-style-type: none"> Quantitative Cross-sectional in-person structured questionnaire 	Adult patients (n = 133) and clinicians (n = 97) who participated in the M4M clinical trial	Binary variable on 5-item Likert scale	<p>The majority of patients and clinicians indicated that financial incentives were a good approach to improve medication adherence. Ethical concerns were categorized according to autonomy, beneficence, non-maleficence, and justice. Patients and clinicians both mentioned various advantages of M4M in clinical practice (e.g., increased adherence and improved insight) but also</p>	Fair

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Table 1 (continued)

Paper	Country	Aim	Design	Participants (n)	Acceptability evaluation method	Results	Quality rating ^a
Priebe et al. (2016)	U.K.	To test the clinical effectiveness of offering financial incentives to patients with psychotic disorders who demonstrate poor adherence to long acting injectable medication; to test the short- and long-term impact of being offered financial incentives once those were discontinued (6 months and 24 months after end of intervention); to establish the views and experiences of both patients and clinicians with offering financial incentives to improve adherence to LAI medication	<ul style="list-style-type: none"> Multi-method Cluster randomized controlled trial and individual interviews with thematic analysis 	Patients prescribed antipsychotic medication (80% diagnosed with schizophrenia, n = 78, 63 patients randomized to intervention, control; n = 45 patients interviewed) and their clinicians (n = 49)	Key themes	disadvantages like reduced intrinsic motivation, loss of autonomy, and feelings of dependence. Offering financial incentives was an effective and cost-effective method of improving adherence. Once incentives were discontinued, patients' adherence returned to the original pattern. Patients reported that financial incentives improved the relationship with clinicians. Some clinicians reported a negative effect of the incentives on their ability to manage patient care and monetization of the relationship. Overall for 77% of patients a positive effect was reported. Some clinicians had ethical concerns before and after intervention, but the majority had a favorable opinion of incentives.	Good/fair (quantitative)
Pullen et al. (2018)	Canada	To evaluate acceptability and satisfaction with project MOVE, an innovative approach to increase physical activity among breast cancer survivors through the combination of microgrants and financial incentives	<ul style="list-style-type: none"> Mixed method Retrospective questionnaire and focus group methodology with thematic content analysis 	Breast cancer survivors from British Columbia (n = 72 questionnaire, n = 52 in 10 focus groups)	5-item Likert scale (details NR), key themes	86.6% of participants were satisfied with project MOVE. Participants emphasized the importance of the microgrant and financial incentives in facilitating physical activity. The \$500 incentive motivated them to increase their physical activity particularly because they did not want to disappoint their team members. Four key themes: how incentives can address or create inequalities; enhance or diminish intrinsic motivation and wellbeing; have a positive or negative effect on relationships with others within personal networks or health providers; and can impact on health systems and resources by raising awareness and directing service delivery but may be detrimental to other health care areas.	Poor/poor (quantitative)
Thomson et al. (2014)	U.K.	To investigate perceived positive and negative consequences of incentive provision to consumers and providers for a shortlist of seven promising incentive strategies for smoking cessation in pregnancy and breastfeeding.	<ul style="list-style-type: none"> Mixed method synthesis Focus group methodology and individual interviews, a cross-sectional survey, plus secondary data from 2 systematic reviews 	Pregnant women, recent mothers, and family members (n = 88); providers (n = 53); experts (n = 24); conference attendees (n = 63); health and early years professionals (n = 497)	Key themes	Four key themes: how incentives can address or create inequalities; enhance or diminish intrinsic motivation and wellbeing; have a positive or negative effect on relationships with others within personal networks or health providers; and can impact on health systems and resources by raising awareness and directing service delivery but may be detrimental to other health care areas.	N/A
Wadge et al. (2015)	U.S.	To test the ethical acceptability of using financial incentives to increase diabetic retinopathy screening attendance	<ul style="list-style-type: none"> Quantitative Self-administered in-person and mailed cross-sectional survey 	Adults with diabetes who attended screening appointment (n = 364) or mailed in survey (n = 6), members of the screening team (n = 5)	Binary variable of statements pairs expressing opposing positions on ethical issues	Participants tended to answer consistently positively or negatively. Vouchers were the most acceptable form of incentive, significantly more than cash. For the patient group, incentives targeted at those most in need were found to be less acceptable than incentives for all. Those aged 40-64 were the most optimistic about potential benefits (age ≥ 65 had more negative views).	Poor
Wen et al. (2016)	U.S.	To develop and test an information-based intervention to increase acceptability of the use of financial	<ul style="list-style-type: none"> Quantitative Randomized controlled trial with pre/post-online survey 	Adults living in US (n = 166)	Binary variable on 5-item Likert scale	The change in acceptability in the intervention group ranged from 19.6% ("Pregnant smokers should not be paid	Good

(continued on next page)

Table 1 (continued)

Paper	Country	Aim	Design	Participants (n)	Acceptability evaluation method	Results	Quality rating ^a
		incentives for smoking cessation during pregnancy				to do things they should do anyway”) to 43.4% (“Using financial incentives is more effective to help pregnancy smokers to quit than many alternative approaches”). Information-based intervention has the potential to improve acceptability of financial incentives for smoking cessation during pregnancy.	
Whelan et al. (2014)	U.K.	To explore healthcare providers' views around whether using financial incentives in areas with low breastfeeding rates would be acceptable in principle and feasible	<ul style="list-style-type: none"> • Qualitative • Descriptive with focus groups and individual interviews with a framework analysis 	Health care workers, public health leads, and commissioner from NHS and Local Authority (n = 16 focus groups, n = 37 interviews)	Key themes	There were no major differences in professional groups (e.g., midwives and health visitors) but a similar range of disparate views was noted across individuals within each professional group. A minority of providers were either very positive or very negative about the scheme. Majority of providers were “on the fence” with a pragmatic view of the plan.	Fair
Whelan et al. (2018)	U.K.	Alongside a RCT testing the effectiveness of a cash transfer (shopping voucher) scheme for breastfeeding, to explore the experiences of health care professionals delivering the scheme	<ul style="list-style-type: none"> • Qualitative • Individual and group interviews with a framework analysis 	Health care professionals (mainly midwives and health workers, n = 34) participating in the NOSH trial	Key themes	Health care providers reported that the scheme fit into routine ways of promoting and encouraging breastfeeding. Providers described women having a positive reaction to the scheme. Incentives helped providers engage women and promote/support breastfeeding in areas with low rates.	Fair

^a For the randomized controlled and cross-sectional studies, we set a cut-off rate on the NHLBI tool of > 7 out of 14 “yes” items as good quality (n = 3 RCT, n = 4 cross-sectional), 5 to 7 “yes” items as fair quality (n = 2 cross-sectional), and < 5 “yes” items as poor quality (n = 1 cross-sectional). The fact that several items on the NHLBI tool were not applicable to the included studies (e.g., associations between exposures and outcomes, assessing exposures over time, and blinding to exposure status) informed the cut-off values. For the qualitative studies, we set COREQ cut-off rate of > 24 out of 32 domain subitems addressed as good (n = 3), 15 to 24 items as fair (n = 7), and < 15 items as poor (n = 0). Mixed- and multi-method studies are also reported separately.

scholarly papers (Volpp and Galvin, 2014; Ashcroft, 2017; Brown, 2017; Furman, 2017; Gorin and Schmidt, 2015; Grant, 2015; Grill, 2017; Klein, 2014; Marteau and Mantzari, 2015; McCartney, 2015; Pomeranz, 2015; Rhodes, 2015; Savulescu, 2017; Schmidt, 2015; Voigt, 2017; Wolff, 2015).

3.2. Quality appraisal

The quality of included studies varied widely (Table 1). One limitation of the RCTs was the limited discussion of outcome measure validity and reliability in 2 studies (Dallery et al., 2017; Wen et al., 2016). Key limitations of the cross-sectional studies included use of convenience samples, low participation rates, and lack of valid and reliable assessment tools. All of the included DCEs addressed at least 28 of 30 subitems on the ISPOR checklist for conjoint analysis applications in health care, in addition to the attribute development process.

For the qualitative studies, we did not include scoring appraisals for Giles et al.'s netnography (Giles et al., 2015c) and the 2 mixed method syntheses (Crossland et al., 2015; Thomson et al., 2014), as they both used secondary data analytic methods not reflected by the COREQ. Strengths included use of participant quotations and description of diverse cases, while a main limitation was inconsistently identified methodological orientation.

3.3. Range of methods to determine acceptability

Table 3 provides an overview of the wide range of methods used to determine acceptability in the empirical studies. The non-comparative and cross-sectional studies used a 4-point scale to estimate perceived helpfulness of rewards (Blondon, 2015), 5-point scale to elicit ratings of interest (Hartzler and Garrett, 2016), dichotomized measure of statements pairs expressing opposing positions on ethical issues (Wadge et al., 2015), categorical variables on 5-item Likert scale (Hoddinott et al., 2014; Berlin et al., 2018), and semantic differential word pairs averaged to create a 1–5 scale and constant-sum comparison technique for mean allocation amounts (Bigsby et al., 2017).

3.4. Range of stakeholders and sociodemographic characteristics

Table 1 also includes the range of stakeholders assessing financial incentive acceptability in the empirical studies. Members of the general public comprised the population of 8 studies (Bigsby et al., 2017; Giles et al., 2016a; Hoddinott et al., 2014; Becker et al., 2018; Berlin et al., 2018; Giles et al., 2015b; Giles et al., 2015c; Johnson et al., 2018). Eighteen studies included individuals from specific health-related groups (Anderson et al., 2017; Berg et al., 2014; Blondon et al., 2014; Blondon, 2015; Crossland et al., 2015; Dallery et al., 2017; Flynn et al., 2017; Greene et al., 2017; Hartzler and Garrett, 2016; Johnson et al., 2018; Marti et al., 2017; McGill et al., 2018; Mitchell et al., 2014; Noordraven et al., 2017; Priebe et al., 2016; Pullen et al., 2018; Thomson et al., 2014; Wadge et al., 2015). Nine studies included perspectives of health care professionals (Anderson et al., 2017; Crossland et al., 2015; Greene et al., 2017; McNaughton et al., 2016; Noordraven et al., 2017; Priebe et al., 2016; Whelan et al., 2018; Whelan et al., 2014; Liu et al., 2017), and 2 studies included views of policymakers related to acceptability of financial incentives (Giles et al., 2016b; McNaughton et al., 2016). Eleven studies included patients or health care professionals who had actually participated in an incentive program (Anderson et al., 2017; Berg et al., 2014; Crossland et al., 2015; Dallery et al., 2017; Greene et al., 2017; Johnson et al., 2018; Noordraven et al., 2017; Priebe et al., 2016; Pullen et al., 2018; Whelan et al., 2018; Liu et al., 2017).

Seven studies specifically examined whether acceptability varied by sociodemographic characteristics of stakeholders (Table 4) (Bigsby et al., 2017; Giles et al., 2016a; Hoddinott et al., 2014; Berlin et al., 2018; Hartzler and Garrett, 2016; McGill et al., 2018; Wadge et al.,

2015). Three studies described gender differences in the context of financial incentive acceptability; males generally preferred incentives more than females (Giles et al., 2016a; Hoddinott et al., 2014; Berlin et al., 2018). Older adults consistently expressed less favorable views toward incentives than younger adults (Bigsby et al., 2017; Hoddinott et al., 2014; Berlin et al., 2018; Hartzler and Garrett, 2016; McGill et al., 2018; Wadge et al., 2015). One study indicated that non-White groups particularly agreed with breastfeeding incentives (Hoddinott et al., 2014), while another found that non-Hispanic Black adults had less favorable attitudes toward incentives (Bigsby et al., 2017). Two studies linked lower education with less support of incentives (Hoddinott et al., 2014; Berlin et al., 2018), while a third study found no difference in preferences for incentives by educational level (Giles et al., 2016a). Stakeholders who themselves displayed the targeted behaviors (e.g., smoking) had more positive attitudes toward incentives in 3 studies (Bigsby et al., 2017; Hoddinott et al., 2014; Berlin et al., 2018). Economic status yielded mixed findings regarding incentive acceptability (Bigsby et al., 2017; Berlin et al., 2018; Wadge et al., 2015). While several papers referenced political ideology, only 1 study specifically examined politics and found that U.S. adults who identify as liberal were more supportive of incentives than conservatives (Bigsby et al., 2017). Study heterogeneity and insufficient data preclude any assertion that certain sociodemographic characteristics moderate acceptability.

3.5. Acceptability by financial incentive aspects and features

Adams and colleagues proposed a framework for describing the complexity of health-promoting financial incentives that identifies 9 domains: direction, form, magnitude, certainty, target, frequency, immediacy, schedule, and recipient (Adams et al., 2014). The framework aims to help researchers and policymakers identify the most effective intervention designs for behavior change. Table 5 highlights specific features of incentive programs that are considered acceptable and unacceptable per the Adams framework, with the exclusion of less ethically-salient items (frequency, immediacy, and schedule) and the addition of funding source (Giles et al., 2015b).

3.6. Key themes related to acceptability

The content analysis identified 5 themes related to acceptability: fairness, messaging, character, liberty, and tradeoffs (Table 7). These themes extend the original review by capturing the nuance of the post-2013 literature and characterizing the overarching frictions described below in the context of incentive design features.

3.6.1. Theme 1: fairness

The potential recipients of financial incentives generated concerns for fairness, with a friction between *facilitating the process of equity by using targeted incentives (incentives for specific populations) and supporting the outcome of equality by universal incentives (incentives for all)*. In the U.S. behaviors like smoking, exercise, and eating contribute to socioeconomic differences in both health and mortality, with a distinct inverse social gradient for risk (Pampel et al., 2010). In both the U.S. and U.K., breastfeeding rates are lowest among women of low socioeconomic status (Hoddinott et al., 2014; Gurka et al., 2014). Targeted incentives have been framed as one tool to foster equity by redistributing resources to improve health outcomes among the most deprived (Hoddinott et al., 2014; Wadge et al., 2015). Targeted incentives avoid a key problem of universal incentives – creating further opportunities for unfair inequalities by providing extra benefits to the already advantaged (Voigt, 2017) – yet more studies reflected stakeholder preferences for universal incentives (Giles et al., 2016a; Flynn et al., 2017; McNaughton et al., 2016; Wadge et al., 2015) over targeted incentives (Giles et al., 2016b; Giles et al., 2015b).

Members of the U.K. public characterized incentives for breastfeeding as divisive and discriminatory (Giles et al., 2015c), and U.K.

Table 2
Summary of scholarly writing included in the review.

Paper	Country	Description
Ashcroft (2017)	U.K.	Discussion paper that highlights the heterogeneity of aims, intentions, targets, and underlying ethical norms of behavior change interventions and criticizes the quality of evidence for these interventions.
Brown (2017)	U.K.	Discussion paper prompted by Michael Sandel's criticism of health incentives and argues that further empirical evidence and theoretical reasoning are required to support the suggestion that incentives are an inappropriate tool for health promotion.
Furman (2017)	U.S.	Discussion paper prompted by Washio et al. (2017) breastfeeding study and argues that cash incentives paid to WIC recipients for breastfeeding can be both ethically defensible and socially responsible.
Gorin and Schmidt (2015)	U.S.	Discussion paper prompted by Wolff's (2015) paper that identifies areas of public health where incentives may play a positive role by serving as "conversation makers" and provides a framework for assessing these incentives.
Grant (2015)	U.S.	Discussion paper that shifts focus of incentives away from forms of trade to forms of power and develops criteria to distinguish legitimate from illegitimate uses of incentives.
Grill (2017)	Sweden	Discussion paper that presents the "Able Chooser Problem:" the use of incentives to promote health outcomes or the ability to choose wisely may sacrifice the interests of the worst off for the benefits of the better off.
Klein (2014)	U.S.	Discussion paper that provides an overview of ethical challenges raised by patient incentives, noting both patient-centered and constituent-oriented concerns, and develops a systematic approach for ethical analysis.
Marteanu and Mantzari (2015)	U.K.	Discussion paper prompted by a smoking cessation study that describes poor public acceptability for financial incentives for smoking cessation despite positive evidence of effectiveness.
McCartney (2015)	U.K.	Discussion paper prompted by ongoing research on financial incentives and comment on the ethics of incentives, particularly as related to professional relationships and deprived communities.
Pomeranz (2015)	U.S.	Legal analysis essay prompted by the Patient Protection and Affordable Care Act (2010) and its final regulations (2013) that evaluates whether the use of penalties to encourage completion of health risk assessments violates the American with Disabilities Act (2010).
Rhodes (2015)	U.S.	Discussion paper that argues for ongoing study of incentives given the lack of persuasive reasons for prohibiting payment in health care.
Savulescu (2017)	U.K.	Discussion paper that highlights the risk of financial incentives forming part of an oversimplified "nudge narrative."
Schmidt (2015)	U.S.	Discussion paper that argues that incentives for completion of mammograms are an ethically problematic distraction in a complex decision-making process and proposes the use of decision aids for this preference sensitive decision.
Voigt (2017)	U.S.	Discussion paper that highlights that incentive schemes targeted at disadvantaged populations are susceptible to significant problems but may be less problematic when they operate in ways different from the "standard" incentive mechanism.
Volpp and Galvin (2014)	U.S.	Discussion paper prompted by a firm's decision to impose penalties on smokers instead of a rewards-based incentive program despite research findings.
Wolff (2015)	U.K.	Discussion paper prompted by criticism of incentive schemes specific to "crowding out" and "corruption" that identifies alternative mechanism for incentives as an "argumentative cover" to support behavior change.

parents expressed concern that immunization incentives could divide the wealthy and poor, particularly when incentives were framed as penalties (McNaughton et al., 2016). Some stakeholders considered ineligibility for a reward as a punishment and believed that targeted incentives were unfair for individuals who already pursue healthy behaviors (Giles et al., 2016b; Giles et al., 2015b; Giles et al., 2015c; Wen et al., 2016). Volpp and Galvin's case study described a firm's decision to impose penalties on smokers instead of a reward-based incentive program for smoking cessation, despite research findings, in response to employee focus groups' objections related to fairness (Volpp and Galvin, 2014). British focus group participants expressed fear of discrimination for those unable to change their behavior, as well as issues with the fairness of taking up a healthy behavior in return for an uncertain incentive (with a preference for certain rewards over lotteries) (Giles et al., 2016a; Giles et al., 2015b).

Table 3
Summary of acceptability evaluation methods.

Empirical methods	Acceptability evaluation methods
Randomized controlled trial	<ul style="list-style-type: none"> ■ 0–4 scale with higher rating for more favorable attitude ■ Dichotomized measure on 5-item Likert scale ■ Treatment Acceptability Questionnaire: 0–100 visual analog scale
Non-comparative & cross-sectional	<ul style="list-style-type: none"> ■ 4-point scale to estimate perceived helpfulness of rewards ■ 5-point scale to elicit ratings of interest ■ 5-point scale to assess agreement with offering incentives ■ 5-item Likert scale (details NR) ■ Dichotomized measure of statements pairs expressing opposing positions on ethical issues ■ Dichotomized measure on 5-item Likert scale ■ Categorical variables on 5-item Likert scale (×2) ■ Semantic differential word pairs averaged to create a 1–5 scale and constant-sum comparison technique for mean allocation amounts
Discrete choice experiment	<ul style="list-style-type: none"> ■ Coefficient from latent class model ■ Marginal utility value (×2) ■ Willingness to accept (WTA) & willingness to wait (WTW)
Individual interview	<ul style="list-style-type: none"> ■ Counts ■ Key themes
Focus group	<ul style="list-style-type: none"> ■ Key themes

3.6.2. Theme 2: messaging

The expressive messaging of financial incentive programs created friction between *signaling the value of the behavior itself in addition to the recipients' efforts versus inviting paternalistic intrusion by social control*. Voigt defines the expressive dimension of incentives as "the implicit meanings and attitudes they express" (p. 164) (Voigt, 2017). Messaging has implications for the target behavior itself. Studies in this review focused on incentives for a diverse set of behaviors (Table 6), and incentives were found to serve multiple functions. For example, incentives can signal the perceived value of a specific health behavior and reinforce health promotion messages (Johnson et al., 2018; Whelan et al., 2014). By increasing uptake of behaviors, like breastfeeding, that may conflict with social norms in certain communities, incentives may promote visibility and normalization (Johnson et al., 2018; Whelan et al., 2014). Providing visibility and legitimization was a key theme from Blondon and colleagues'

Table 4
Summary of sociodemographic information of participants rating acceptability.

Category	Findings	Authors
Gender	1. More females disagreed with shopping vouchers than males 2. Incentives were more acceptable to males than females 3. Males were more likely to agree with providing incentives during pregnancy and after birth than females	1. Hoddinott et al. (2014) 2. Giles et al. (2016a) 3. Berlin et al. (2018)
Age	4. Younger adults preferred incentives over older 5. Older adults had less favorable views	4. Hoddinott et al. (2014) 5. Bigsby et al. (2017), Berlin et al. (2018), McGill et al. (2018), Hartzler and Garrett (2016), Wadge et al. (2015)
Ethnicity	6. Non-White groups particularly agreed with breastfeeding incentives 7. Non-Hispanic Black adults had less favorable attitudes toward incentives	6. Hoddinott et al. (2014) 7. Bigsby et al. (2017)
Education	8. Adults with lowest education level disagreed with incentives 9. Adults with secondary school completion were less likely to support incentives than undergraduate level 10. No differences	8. Hoddinott et al. (2014) 9. Berlin et al. (2018) 10. Giles et al. (2016a)
Health issues	11. Current smokers/previous stop attempters + women who had breastfed children were more open to respective incentives 12. Adults who are overweight and/or smoke had with more positive attitudes toward incentives 13. Current smokers/previous stop attempters were more in favor of providing vouchers at a higher amount than nonsmokers	11. Hoddinott et al. (2014) 12. Bigsby et al. (2017) 13. Berlin et al. (2018)
Economic status	14. Adults with higher levels of deprivation had increased acceptability scores 15. Lower equivalized income had less support for incentives 16. Being employed or belonging to lower middle class compared to higher social grades increased the likelihood of being in favor of financial incentives	14. Wadge et al. (2015) 15. Bigsby et al. (2017) 16. Berlin et al. (2018)
Political ideology	17. Liberal adults were more supportive of incentives than conservatives	17. Bigsby et al. (2017)

Table 5
Summary of features and aspects of financial incentives programs that are considered acceptable or unacceptable.

Incentive features	Key empirical findings	Papers
Direction: reward or penalty	1. Preference for rewards over penalties 2. Penalty for non-vaccination over reward for vaccination	1. Giles et al. (2015b), Giles et al. (2016b) 2. McNaughton et al. (2016)
Form: cash, voucher, deposit	3. Cash and vouchers not less acceptable than no incentive (except significant preference for cash compared to no incentive for vaccine attendance) 4. Cash and (high street) vouchers equally preferable 5. Cash preferable to (local shop) vouchers 6. Preference for cash (among “at high risk” group) 7. Preference for vouchers 8. Deposits viewed unfavorably 9. Preference for “less restrictive” incentives	3. Giles et al. (2016a) 4. Becker et al. (2018) 5. Becker et al. (2018) 6. Flynn et al. (2017) 7. Giles et al. (2015b), McGill et al. (2018), Mitchell et al. (2014), Wadge et al. (2015), Whelan et al. (2014) 8. Dallery et al. (2017), Giles et al. (2016b), McGill et al. (2018) 9. Crossland et al. (2015)
Magnitude: value	10. Preference for smaller value 11. Preference for higher value (not “at high risk” group) 12. Willingness to participate increases with value	10. Giles et al. (2016a), Giles et al. (2016b), Wadge et al. (2015) 11. Flynn et al. (2017) 12. Marti et al. (2017)
Certainty: guaranteed or lottery	13. Preference for certain reward over lottery 14. Preference for no incentive over lottery 15. Preference for fixed-ratio over variable-ratio rewards	13. Giles et al. (2016b), Marti et al. (2017) 14. Giles et al. (2016a) 15. Hartzler and Garrett (2016)
Target: process, outcome, proxy	16. Preference for process over outcomes	16. Blondon et al. (2014)
Recipient: targeted or universal	17. Pregnant women and low-income groups more acceptable 18. Preference for targeting to vulnerable groups 19. Preference for universal	17. Giles et al. (2015b) 18. Giles et al. (2016b) 19. Flynn et al. (2017), Giles et al. (2016a), McNaughton et al. (2016), Wadge et al. (2015)
Funder: private or public Other	20. Preference for private payor 21. Option to forward reward to charity	20. Bigsby et al. (2017), Mitchell et al. (2014) 21. Mitchell et al. (2014)

interviews with patients and professionals on financial incentives for diabetes self-management (Blondon et al., 2014). Rewards can also recognize individuals' efforts for better health, shifting focus from failure to success. In the NOSH trial women perceived vouchers for breastfeeding as a reward, a bonus, “something to look forward to,” and “help to keep going” (Johnson et al., 2018). Likewise, in the FIAT trial patients reported that receiving a £15 incentive from their clinician was a sign of being valued and contributed to improved relationships with health care professionals (Priebe et al., 2016).

In contrast, Voigt identifies the potentially negative expressive value of financial incentives. Incentives can signal unequal social status, reinforce hierarchical attitudes, and perpetuate assumptions that behavior change challenges are purely motivational in nature, as opposed to structural

(Voigt, 2017). Paternalistic interventions may inadvertently undermine individual responsibility, a key incentive objective described below (Thomson et al., 2014). Some stakeholders characterized incentives as patronizing (Blondon et al., 2014) and “personally insulting” (Giles et al., 2015c). Giles et al.'s analysis of U.K. reader comments on incentives for breastfeeding underscored distaste for the “nanny state” interfering in everyday lives and decision-making (Giles et al., 2015c). Some patients expressed privacy concerns and insurance implications of externally-monitored health outcomes (Blondon et al., 2014).

3.6.3. Theme 3: character

Another friction existed between *trusting individuals' use of incentives to optimize their health versus encouraging gaming, cheating, or*

“unwise” spending. Incentive forms – from cash to vouchers to deposits (i.e., individual financial investments are not recouped if the target is not achieved) – vary in their degree of restrictiveness, and thus allow different opportunities for use (e.g., practical benefit vs. enjoyment) (Crossland et al., 2015). Per Crossland et al., unrestricted incentives, like cash or shopping vouchers not only convey trust, but may allow recipients to optimize their own motivation with the option to “save up,” which can facilitate essential skills like planning, goal setting, and delay gratification, all of which sustain behavior change. Rhodes argued that cash incentives ultimately promote well-being by allowing individuals to decide for themselves what will make them better off (Rhodes, 2015). Interestingly, members of the U.K. general public trusted *themselves* to not misuse cash rewards, but did not trust others to report behavior change truthfully or spend money wisely (Giles et al., 2015b).

Concerns for gaming, cheating, or “unwise” spending factored prominently into determinations of unacceptability (Anderson et al., 2017; Giles et al., 2016b; Giles et al., 2015b; McNaughton et al., 2016; Thomson et al., 2014; Whelan et al., 2014). Specifically, Giles and colleagues’ interviews with British policymakers (with examples of breastfeeding, smoking in pregnancy, and weight loss incentives) noted a fundamental distrust around individuals “gaming the system” (Giles et al., 2016b). Clinicians in the FIAT trial reported that some participants spent their incentive money on illicit drugs (though participants in the Money for Medication trial incentive arm did not use more alcohol or illicit drugs than the control group) (Noordraven et al., 2017). Clinicians also expressed concern for being “the banker” (Priebe et al., 2016) or needing to “police” behaviors (Whelan et al., 2014). Across studies in the review, vouchers were generally considered more acceptable than cash incentives (Giles et al., 2015b; McGill et al., 2018; Mitchell et al., 2014; Wadge et al., 2015; Whelan et al., 2014). Policymakers and members of the U.K. general public preferred rewards over penalties (Giles et al., 2016b; Giles et al., 2015b), and deposits, more restrictive than rewards, were viewed unfavorably (Giles et al., 2016a; Dallery et al., 2017; McGill et al., 2018). (Here, the distaste for deposits is outside the specific discussion of character; participants in McGill’s weight loss study disliked paying a deposit they might not recover or “gambling” on their own success (McGill et al., 2018).)

3.6.4. Theme 4: liberty

The impact of financial incentives on recipient autonomy generated a friction between **creating opportunities for choice and value expression and creating pressure or perceptions of failure**. Peer influences and group membership impact health behaviors and social norms that contribute to unhealthy behaviors may be framed as a particular form of disadvantage (Voigt, 2017; Pampel et al., 2010). Wolff argued that incentives can operate by both rationalization and motivation-based mechanisms (Wolff, 2015). In situations in which it may be difficult to defend one’s actions based on true motivations, incentives can justify an individual’s course of action to her peers by providing

“argumentative cover” (i.e., “only doing it for the money”) (Gorin and Schmidt, 2015; Wolff, 2015). Gorin and Schmidt extend Wolff’s argument that incentives then promote autonomy by countering forces, like social pressures, that obstruct the exercise of an individuals’ intrinsic motivation (Gorin and Schmidt, 2015). One midwife from Whelan and colleagues’ study described how financial incentives may help women justify breastfeeding, particularly if she is being pressured to stop: “[...] I have seen mums who feel quite influenced by what their peers are saying, especially their mother, and maybe this will be an extra defence for them to keep going [...]” (p. 5) (Whelan et al., 2014). Rhodes further argued that incentives can promote autonomy by allowing individuals to make choices that express their values (Rhodes, 2015).

Two clinical trials involving incentives for medication adherence reported the potential for incentives to undermine voluntariness. In a questionnaire of participants in the Money for Medication trial, approximately 33% of patients and clinicians reported that if patients were offered money, they would feel pressured or coerced to accept their antipsychotic depots (Noordraven et al., 2017). Some patients from the FIAT trial reported feeling obliged or forced into taking their medication despite disliking it or feeling that it was not helpful (Priebe et al., 2016). Furman described an argument that incentives for breastfeeding can unduly influence “a women’s right to choose how she cares for her infant and what she does with her body” (p. 1) (Furman, 2017). In the context of breastfeeding, clinicians also noted concern for coercion from women’s partners (Whelan et al., 2014), though this concern was not realized in the NOSH trial (Whelan et al., 2018). Worries about the emotional impact of incentives were specific to breastfeeding itself, highlighting the layers of meaning associated with this target behavior: “There is enough pressure on new mums as it is to breastfeed, which makes new mums feel like they are a failure if they can’t do it” (p. 7) (Giles et al., 2015c). A separate issue of voluntariness arises in the form of incentives; Pomeranz’s legal analysis examined the threshold at which financial penalties transform health risk assessments from voluntary tools to unavoidable requirements (Pomeranz, 2015). Pomeranz argued that the most straightforward solution is to limit the definition of reward to a positive feature for wellness programs, reducing the workplace burden of penalties (Pomeranz, 2015).

3.6.5. Theme 5: tradeoffs

The friction between **kindling shared public health goals by increasing engagement and creating entitlement and value corruption** also influenced perceptions of financial incentive acceptability. Health care professionals in the FIAT trial, TLC-Plus study, NOSH trial, and Health Models incentive program all reported increased engagement among participants who received financial incentives. Clinic staff from the Health Models program identified that patients were incentivized to develop new habits of HIV treatment and preventative care that aligned with public health goals of reducing transmissible HIV in the community (Anderson et al., 2017). One investigator from the TLC-PLUS study,

Table 6

Summary of the nature of the behavior incentivized.

Target behavior ^a	Number	Authors
Breastfeeding	9	Becker et al. (2018), Crossland et al. (2015), Furman (2017), Giles et al. (2015a, 2015b, 2015c), Giles et al. (2016b), Hoddinott et al. (2014), Johnson et al. (2018), Whelan et al. (2018), Whelan et al. (2014)
Medication adherence	6	Anderson et al. (2017), Greene et al. (2017), Liu et al. (2017), Marti et al. (2017), Noordraven et al. (2017), Priebe et al. (2016)
Physical activity	3	Giles et al. (2016a), Mitchell et al. (2014), Pullen et al. (2018)
Screening	4	Bigsby et al. (2017), Giles et al. (2016a), Schmidt (2015), Wadge et al. (2015)
Self-management	2	Blondon et al. (2014), Blondon (2015)
Smoking cessation	11	Berg et al. (2014), Berlin et al. (2018), Bigsby et al. (2017), Crossland et al. (2015), Dallery et al. (2017), Giles et al. (2016a), Giles et al. (2016b), Hoddinott et al. (2014), Marteau and Mantzari (2015), Volpp and Galvin (2014), Wen et al. (2016)
Substance use reduction	1	Hartzler and Garrett (2016)
Vaccination	3	Flynn et al. (2017), Giles et al. (2016a), McNaughton et al. (2016)
Weight loss/maintenance	3	Bigsby et al. (2017), Giles et al. (2016b), McGill et al. (2018)

^a Single papers may address acceptability of more than one behavior. Empirical and scholarly papers included. Papers that do not address a specific behavioral target (e.g., refer broadly to “healthy behavior”) are not included in this table.

Table 7
Inductively developed themes.

Themes	Frictions related to acceptability of financial incentives	Papers	Number
Fairness	Facilitate the process of equity by targeted incentives/support the outcome of equality by universal incentives	Blondon et al. (2014) ^a , Giles et al. (2015b) ^a , Giles et al. (2016b) ^a , McNaughton et al. (2016) ^a , Thomson et al. (2014) ^a , Voigt (2017) ^b , Volpp and Galvin (2014) ^a , Wadge et al. (2015) ^a	n = 8
Messaging	Signal the value of the behavior itself in addition to the recipients' efforts/invite paternalistic intrusion by social control	Blondon et al. (2014) ^a , Giles et al. (2015a) ^a , Johnson et al. (2018) ^a , Klein (2014) ^b , Priebe et al. (2016) ^a , Thomson et al. (2014) ^a , Voigt (2017) ^b , Whelan et al. (2014) ^a	n = 8
Character	Support individual responsibility alongside self-determination/encourage gaming, cheating, or "unwise" spending	Anderson et al. (2017) ^a , Crossland et al. (2015) ^a , Giles et al. (2015b) ^a , Giles et al. (2016b) ^a , McNaughton et al. (2016) ^a , Noordraven et al. (2017) ^a , Rhodes (2015) ^b , Thomson et al. (2014) ^a , Whelan et al. (2014) ^a , Wolff (2015) ^b	n = 10
Liberty	Create opportunities for choice and value expression/create pressure or perceptions of failure	Gorin and Schmidt (2015) ^b , Rhodes (2015) ^b , Priebe et al. (2016) ^a , Thomson et al. (2014) ^a , Voigt (2017) ^b , Whelan et al. (2014) ^a , Wolff (2015) ^b	n = 7
Tradeoffs	Kindle shared public health goals by increasing engagement/create entitlement and value corruption	Anderson et al. (2017) ^a , Brown (2017) ^b , Giles et al. (2015a) ^a , Giles et al. (2016b) ^a , Grant (2015) ^b , Greene et al. (2017) ^a , Furman (2017) ^b , Johnson et al. (2018) ^a , Marteau and Mantzari (2015) ^b , Thomson et al. (2014) ^a , Whelan et al. (2014) ^a , Whelan et al. (2018) ^a	n = 12

^a Empirical paper.

^b Scholarly paper.

which provided rewards for HIV viral load suppression, commented, "[...] the providers actually really liked it" (p. 10) (Greene et al., 2017). Clinicians from the NOSH trial reported that incentives helped support breastfeeding in areas with historically low rates (Whelan et al., 2018). In their paper on smoking cessation, Marteau and Mantzari cited compelling evidence for incentives and asked, "Why is there not greater acceptability of a seemingly cost-effective intervention for reducing the leading cause of preventable premature death worldwide?" (p. 41) (Marteau and Mantzari, 2015).

Perceptions of financial incentives as "bribery" also featured notably in several papers (Anderson et al., 2017; McNaughton et al., 2016; Priebe et al., 2016; Whelan et al., 2014). U.K. clinicians, patients, and members of the general public expressed concern for the nature of cash transactions and the commodification of social roles (particularly monetization of clinical relationships), good parenting (e.g., vaccination), and duty to care for one's health (McNaughton et al., 2016; Priebe et al., 2016; Wadge et al., 2015). While incentives have been framed as opportunities to promote responsibility and self-determination, as described above, 11 empirical papers specifically referenced personal responsibility in the context of unacceptability, reflecting the belief that individuals have an *a priori* obligation to care for themselves. For example, when asked about the concept of payment for viral suppression, one patient stated, "People should want to just be healthy ... you shouldn't want to get paid to take your medication" (p. 9) (Greene et al., 2017). Financial incentives generated concerns about reduced intrinsic motivation, contributing to entitlement and expectations of payment for additional healthy behaviors (Giles et al., 2016b; Thomson et al., 2014). While clinicians in the TLC-PLUS study and FIAT study generally expressed favorable views, they did acknowledge negative interactions with some patients related to "pay day" demands (Greene et al., 2017; Priebe et al., 2016). Brown addressed arguments for both efficiency corruption (due to motivation crowd-out) and value corruption (acting for the "wrong" reasons) and concluded that the empirical evidence for these concerns is limited, while not dismissing their plausibility (Brown, 2017). Stakeholders (specifically here members of the general public, policymakers, and patients) who supported incentives generally preferred incentives of smaller value compared to larger rewards (Giles et al., 2016a; Giles et al., 2016b; Wadge et al., 2015).

4. Discussion

4.1. Statement of principal findings

This is the second comprehensive review of acceptability of financial incentives for health-related behavior change. The number of papers included in this review (n = 47) indicates the fast-moving pace

of incentive research post-2013 and confirms the value in updating the original study (n = 81). Of the 47 included papers, 65% represented empirical data with a nearly even split between qualitative and quantitative methods. Increased in-depth qualitative work addressed a specific gap in the original review.

The scholarly papers contributed a range of viewpoints on acceptability of financial incentives from perspectives of philosophers, physicians, and public health scholars. The depth of argument varied, and papers that provided rich theoretical background to the conflicts described by stakeholders, like Voigt's discussion of targeted incentive schemes (Voigt, 2017), contributed more significantly. The absence of distinct counterpoints may have influenced the analysis, though on the whole the scholarly papers reflected both ends of the acceptability spectrum.

Researchers explored acceptability in a wide range of stakeholders, including the general public, policymakers, clinicians, and diverse patient populations. Few studies examined sociodemographic characteristics of the populations rating acceptability; males and younger adults generally preferred incentives over females and older adults. While the data are insufficient to determine whether acceptability varies by the nature of the incentivized behavior, breastfeeding, medication adherence, smoking cessation, and vaccination presented a more complicated picture of acceptability than physical activity, weight loss, and self-management.

Stakeholders generally preferred rewards over penalties (reported by members of the U.K. general public (Giles et al., 2015b) and policymakers (Giles et al., 2016b)), vouchers over cash (U.K. general public (Giles et al., 2015b), potential recipients (McGill et al., 2018; Mitchell et al., 2014; Wadge et al., 2015), and health care professionals (Whelan et al., 2014)), smaller values over large (U.K. general public (Giles et al., 2016a), policymakers (Giles et al., 2016b), and potential recipients (Wadge et al., 2015)), and certain rewards over lotteries (U.K. policymakers (Giles et al., 2016b) and potential recipients (Marti et al., 2017)). Deposits were viewed unfavorably (Dallery et al., 2017; Giles et al., 2016b; McGill et al., 2018). Overall findings are mixed on acceptability of targeting specific populations, as well as the extent to which individuals of more deprived backgrounds welcome these interventions. Stakeholders preferred universal incentives in 4 studies (Giles et al., 2016a; Flynn et al., 2017; McNaughton et al., 2016; Wadge et al., 2015).

Five themes captured issues related to acceptability of specific aspects and features of financial incentives: 1) fairness, 2) messaging, 3) character, 4) liberty, and 5) tradeoffs. The themes' associated frictions reflect the substantial paradoxes characterizing the financial incentive landscape, as well as the dimensional influences (with notable ethical nuance) on stakeholder perceptions of specific incentive design features.

Acceptability of incentives remains polarized, and, as described in

the original study, is shaped in complex and unpredictable ways (Giles et al., 2015a). We found less emphasis on effectiveness and cost effectiveness compared to the original review. The role of effectiveness as a moderator of acceptability merits further examination (also in light of Promberger and colleagues' finding that the acceptability of financial incentives is not necessarily negative but rather contingent on their effectiveness) (Giles et al., 2015a; Promberger et al., 2012). Compared to the original review, we noted increased emphasis on the role of personal responsibility for health, with explicit concerns that rewards may erode responsibility. Both reviews described an outstanding question of whether incentives undermine or foster autonomy, particularly among low socioeconomic groups, reflecting the need for further empirical research related to incentive design and implementation in targeted populations.

4.2. Strengths and weakness of included work

Eleven studies (Anderson et al., 2017; Berg et al., 2014; Crossland et al., 2015; Dallery et al., 2017; Greene et al., 2017; Johnson et al., 2018; Noordraven et al., 2017; Priebe et al., 2016; Pullen et al., 2018; Whelan et al., 2018; Liu et al., 2017) included participants (both patients and health care professionals) of financial incentive programs, an essential stakeholder group whose views were not fully captured in the original review. These individuals provided unique insights on the delivery of incentive programs for health-related behavior change. Participants generally viewed financial incentives favorably, indicating a mismatch between direct experiences and theoretical concerns. The inclusion of both empirical and scholarly papers created a bridge across disciplines and added dynamic context to the interpretation.

Definitions of acceptability were sparse throughout the included papers, and authors of the quantitative studies presented limited justification for the selected measures. While the absence of definitions and unclear measures reflect the complicated nature of acceptability itself, methodological limitations raise concern for validity and reliability,

Appendix 1. Databases searched: Medline, Embase, Web of Science, Cumulative Index to Nursing and Allied Health Literature, PsycINFO, Sociological Abstracts, Scopus, Philosopher's Index, Cochrane Library, and International Bibliography for Social Sciences

1. (Conditional adj2 (cash or payment\$)).af.
2. (contingency adj2 management).af.
3. (financial adj2 incentive\$).af.
4. (gift adj2 certificate\$).af.
5. (tax adj2 credit\$).af.
6. (award\$ or benefit\$ or competition\$ or contest\$ or coupon\$ or discount or discounts or disincentiv\$ or forfeit\$ or incentiv\$ or lotter\$ or monetary or nonmonetary or payment).af.
7. (penalt\$ or prize\$ or reinforcement or relinquish\$ or reward\$ or taxation or taxes or token\$ or voucher\$).af.
8. (pay\$ adj2 deduction\$).af.
9. P4P4P.af.
10. (Pay-For-Performance adj3 Patients).af.
11. ((Extrinsic or external) adj2 motivat\$).af.
12. (penalisation or penalization or penalise or penalize).af.
13. or/1-12
14. exp reward/ or Gift Giving/es or *Punishment/ or Employee Incentive Plans/es or *Motivation/es or *achievement/ or *goals/ or *intention/
15. 13 and 14
16. (Moral or ethic\$ or coercion or motivation\$ or fairness or acceptability or inducement or controvers\$ or coercive or reinforcement or unethical).af.
17. (personal adj2 autonomy).af.
18. morals/ or ethics/ or exp social responsibility/ or exp principle-based ethics/ or Coercion/
19. or/16-18
20. 15 and 19
21. exp Attitude to Health/ or Harm Reduction/es or health behavior/ or exp health promotion/es or exp life style/ or *occupational health/es or exp preventive health services/es or *patient compliance/ or *risk reduction behavior/ or occupational health services/es
22. ((attitude or promotion or public) adj2 health\$).af.
23. ((change or intervention or modification or risk or therapy or health\$) adj3 behavior\$).af.
24. (attitude-change or attitude\$ or life-style or lifestyle or abstinence or preventi\$ or preventative).af.
25. or/21-24
26. 20 and 25
27. limit 26 to (english language and humans)

Medline search replicated from Giles et al. (2015a).

especially given the potential impact of this research on public policy. The original review reported similar issues related to measurement (Giles et al., 2015a).

4.3. Limitations of the review

The findings in this review represent acceptability post-2013, thus does not present a synthesized understanding of the total acceptability literature related to financial incentives. The empirical studies included only the U.S., U.K., Australia, Canada, and France, which limits our understanding of how stakeholders view acceptability across cultural contexts and health systems. The inclusion criteria of developed countries excluded much of the literature specific to conditional cash transfer programs.

5. Conclusion

As researchers, clinicians, and policymakers explore the use of incentives for challenging health behaviors, additional research is needed to understand how acceptability influences uptake. The importance of both behaviorally and ethically-informed design that incorporates stakeholder perspectives cannot be minimized. Further research may illuminate how acceptability of specific incentive design features influences participation, engagement, and ultimately health outcomes.

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