Evidence overview

Impact of in-store advertising on consumer purchasing

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Obesity Action Scotland
Healthy weight for all

Summary

Background. Obesity has been a public health issue in Scotland for years. An obesogenic environment, where it is easy and cheap to consume an excess of calorie-dense but nutrient-poor food and drink, is partly responsible for this reality. Products high in fat, sugar and salt (HFSS) are very popular, present and promoted in virtually every store in Scotland. The Scottish Government committed to introduce legislation restricting promotion of HFSS products.

Aim. This evidence overview was conducted to search for and critically review literature that examines the links between in-store advertising and impulse buying or buying in greater amounts.

Methods. A systematic literature search was confined to publications in English language and not time-restricted: the identified papers were published between 1923 and 2019. The search was conducted on three databases: Medline, PsychInfo, and Business Source Complete. Studies meeting search criteria were identified and critically appraised. The included studies reported interventions in physical stores with outcome variables of purchasing behaviour.

Results. Initial searches identified 1118 potentially relevant papers, of which 17 (4 systematic reviews and 13 original studies) met all inclusion criteria. Based on the dates of publication of the identified papers, the knowledge of effectiveness of in-store advertising is not new. Strategies used in the included papers focused on placement, availability, shelf labels and signage. All papers included in this evidence overview, focusing on food but also on other goods, suggested in-store advertising increased sales or stimulated impulse buys, at least to some extent. The effect of in-store advertising on impulse buys may be stronger for groceries than other goods.

Conclusions. This evidence overview indicates that in-store advertising is likely to promote sales of food and drink and other products, and could stimulate impulse purchases too. This is not surprising, given the popularity of these strategies in Scotland and the UK. Restriction of in-store advertising of HFSS products, especially combined with pricing strategies, is a public health policy that could contribute to improvements in population's diet and health.

Contents

Background and context

Obesity has been a public health issue in Scotland for years.[1] An obesogenic environment, where it is easy and cheap to consume an excess of calorie-dense but nutrient-poor food and drink, is partly responsible for this reality.[2] Products high in fat, sugar and salt (HFSS) are very popular and present in virtually every store in Scotland. Moreover, they are aggressively advertised and promoted, which can be easily verified by watching prime time TV or visiting a local supermarket in Scotland.

In-store advertising, including location, displays and signage are methods that retailers have been using to increase their sales for decades.[3] Abratt and Goodey in 1990 proposed the following definition: "In-store stimuli are promotional techniques employed to increase unplanned (or subconsciously planned) purchases of products. These techniques include in-store siting, on-shelf positions, price-off promotions, sampling, point-of-purchase displays, coupons, and in-store demonstrations."[4] This evidence overview focused on all non-monetary in-store advertising; it investigated the links between in-store advertising and buying in greater amounts, or impulse buying. The main focus was food, but evidence around other types of products was also considered.

Aims and objectives: To search for and critically review literature that examines the links between in-store advertising and impulse buying or buying in greater amounts. Specifically, we aimed to answer two questions:

1. What evidence is there that in-store advertising encourages people to buy on impulse?
2. What evidence is there that in-store advertising encourages people to buy in greater amounts?

Findings that might be relevant to the Scottish population were of particular interest, given the Scottish Government's commitment to introduce legislation restricting promotion of HFSS products.[5]

Definitions

"in-store" is used here to mean places where food is sold to the public; this includes stores, out of home sector, as well as online websites that sell goods

"in-store advertising" includes, among other things, fixtures and fittings such as posters and other advertising paraphernalia, shelf-edge displays and signage, branded chillers and floor display units; online in-store advertising; all at the point of purchase

This evidence overview therefore covers:

(1) non-monetary promotions and advertising in physical retail stores (defined by The Scottish Government as "marketing or promotion that is not a price promotion, e.g. placement promotions."; including positional or location promotions involving store layout (i.e. end of

aisle, front-of-store and checkout displays), product information promotions (i.e. banners, flyers, shelf decoration), promotions with prizes (i.e. prize draws)[6])

(2) non-monetary promotions and advertising in online stores (positioning on the website, prompts etc.)

Methods

Key search terms were defined using the PICOS approach (Table 1). A systematic approach to searching, screening, and study selection was undertaken (Tables 2, 3 and 4).

Table 1. Research question using PICOS approach

Domain	Search term
Population	Adults (over-18s)
Intervention	In-store advertising causing impulse buying or buying greater amounts of food and drink than originally planned
Comparison	Where there is a comparison group, then it could be a historical control group or absence of in-store advertising
Outcomes	Amount / volume of goods purchased
Study design	Any study design

We chose to focus on the population of adults because they are likely to be less affected by marketing than children;[7] it is known that children even at age 12 have still not acquired an adult-like understanding of advertising's selling and persuasive intent.[8] Additionally, adults constitute the majority of shoppers both in physical retail stores and online. Therefore, if the effects of in-store marketing are found for adults, the conclusions will apply to the majority of shoppers and the effect in children can be expected to be the same, if not bigger.

Databases included in the search: Medline, PsychInfo, Business Source Complete

Search Strategy: Searches were conducted by combining the following four groups of search terms: those that focused on customer age group and role in purchasing, those that defined advertising techniques, those that specified place of advertising, and those that defined purchasing. Search of MEDLINE and PsycInfo databases was done via Ovid platform; all searches were done using the code label command of multiple posting ".mp" searching the MeSH subject heading field, title field, abstract or name of substance field[9] (Table 3). Search Business Source Complete database was conducted via EBSCO platform; "unqualified" search was used searching default fields of authors, subjects, keywords, title information (including source title), and abstracts.[10]

Table 2. Search strategy for an electronic literature search of Medline and PsycInfo via Ovid

Search step	Search term	Fields searched	Comments / justification
#1	adult* or men or women or shopper* or customer*	.mp	Focuses on age group and role in purchasing
#2	market* or advertis* or promot* or place promot* or nudg* or influenc* or highlight* or place or checkout or end of aisle or banner or flyer or shelf or shelf signage or prize draw or front of store or branded chiller* or bin* or point-of-sale or point of sale	.mp	Focuses on advertising techniques
#3	retail or shop or store or outlet or supermarket or hypermarket or market or convenience or corner or grocery or out of home or restaurant or cafe or cafeteria or quick serve or fast serve or in-store or in-premise or online shop or online store or online grocery or take away or takeaway or out of home or delivery or delivery platform or online delivery	.mp	Focuses on place of advertising, including online sites, takeaways, online delivery platforms
#4	purchas* more or buy* more or purchas* excess or buy* excess or increas* purchas* or impulse buy*	.mp	Focuses on purchasing
#5	#1 AND #2 AND #3 AND #4		Combines steps 1-5 ensuring that all studies looking at the effects of in -store advertising on purchasing behaviour are included
#6	limit 5 to (human and English language)		To make sure findings are relevant and possible to understand
#7	Remove duplicates		

Table 3. Search strategy for an electronic literature search of Business Source Complete database via EBSCO

Search step	Search term	Fields searched	Comments / justification
#1	adult* or men or women or shopper* or customer*	unqualified	Focuses on age group and role in purchasing
#2	market* or advertis* or promot* or place promot* or nudg* or influenc* or highlight* or place or checkout or end of aisle or banner or flyer or shelf or shelf signage or prize draw or	unqualified	Focuses on advertising techniques

	front of store or branded chiller* or bin* or point-of-sale or point of sale		
#3	retail or shop or store or outlet or supermarket or hypermarket or market or convenience or corner or grocery or out of home or restaurant or cafe or cafeteria or quick serve or fast serve or in-store or in-premise or online shop or online store or online grocery or take away or takeaway or out of home or delivery or delivery platform or online delivery		Focuses on place of advertising, including online sites, takeaways, online delivery platforms
#4	purchas* more or buy* more or purchas* excess or buy* excess or increas* purchas* or impulse buy*	unqualified	Focuses on purchasing
#5	food OR drink OR beverage OR meal OR grocer*	unqualified	Focuses on all food and drink
#6	#1 AND #2 AND #3 AND #4 AND #5		Combines steps 1-5 ensuring that all studies looking at the effects of in-store advertising on purchasing behaviour are included
#7	limit 5 to English language		To make sure findings are relevant and possible to understand

Table 4. Inclusion and exclusion criteria

Domain	Inclusion criteria	Exclusion criteria
Problem/population	Adult humans, 18 years old and older	Non-human studies; child or adolescent populations; studies involving people with developmental or intellectual disabilities due to the unique needs of these populations
Intervention	Studies investigating effect of in-store advertising, at the point of purchase, on purchasing of food and other products	Studies that investigate the effects of labelling, loyalty programmes
Outcomes	Purchase or purchase intention of food and drink and other products*	Lack of purchase or purchase intention as an outcome
Study design	Any study design	Protocols or study outlines without results; dissertations and theses, conference abstracts and proceedings (due to time limitations)

Other variables	English language publications; peer-reviewed papers from academic journals; there was no publication date restriction applied	non-English language papers; low and middle income countries

* Business Source Complete database was searched for food and drink items only due to a large number of returned citations

Study selection: After initial duplicate removal, the titles and abstracts were screened. Following that, full versions of papers were reviewed to ensure inclusion criteria were met.

Data extraction and quality appraisal: Data from each included study were extracted to a table, detailing date, study design, population, geographical location, focus, outcomes, findings and conclusions. Studies were also graded according to their context: A (directly relevant, Scottish based); B (probably relevant, non-Scottish based but due to cultural and economic similarities should apply to Scotland); C (possibly relevant, non UK but should be interpreted with caution due to strong cultural or institutional differences); D (not relevant, clearly irrelevant due to cultural, institutional or legislative differences).

Quality appraisal: We adopted the Evidence for Policy and Practice Information and Co-ordinating Centre (EPPI-Centre, 2010) approach to assessing quality and relevance of studies: EPPI-Centre weight of evidence (WoE) judgments were applied to each of the included reviews or studies. Three components were assessed in order to help derive an overall weighting of evidence score (Table 6):

- **Methodological quality (MQ):** the trustworthiness of the results judged by the quality of the study within the accepted norms for undertaking the particular type of research design used in the study. This involved asking questions related to a study's reporting, context, sample, design, reliability and validity of data-collection and analysis (including appropriate number and range of explanatory variables in the statistical models), ethics, sample size, risk of bias resulting from selection and maintenance of sample, and generalisability.
- **Methodological relevance (MR):** the appropriateness of the study design for addressing their particular research question/s
- **Topic relevance (TR):** the appropriateness of focus of the research for answering the review question

The following scoring system was used to make assessments for each of the three components assessed: 1 = excellent, 2 = good, 3 = satisfactory, 4 = inadequate.

Judgement of overall weight of evidence (WoE) was made based on the assessments for each of the above criteria and by using the same scoring system. Studies classified as satisfactory overall were still included (by one researcher conducting this review) as they met the inclusion criteria for the review, but less reliance was placed on their results.

The findings of the studies were grouped depending on whether they addressed impulse buying specifically or purchase volume in general. A narrative synthesis of the study findings under each of the review questions was then conducted. Finally, policy actions and managerial recommendations suggested by the authors of the included papers were summarised to understand what the researchers concluded in terms of practical application of the knowledge.

Results

Initial searches identified 1118 potentially relevant papers in English. Following removal of duplicates (n=15), 1103 studies were identified for screening. Title and abstract screening identified 35 full text papers for consideration. They were then fully read and 17 of them were considered to meet all inclusion criteria. Reasons for exclusion of the full text papers are given in Appendix 1. This process is summarised on Figure 1 below.

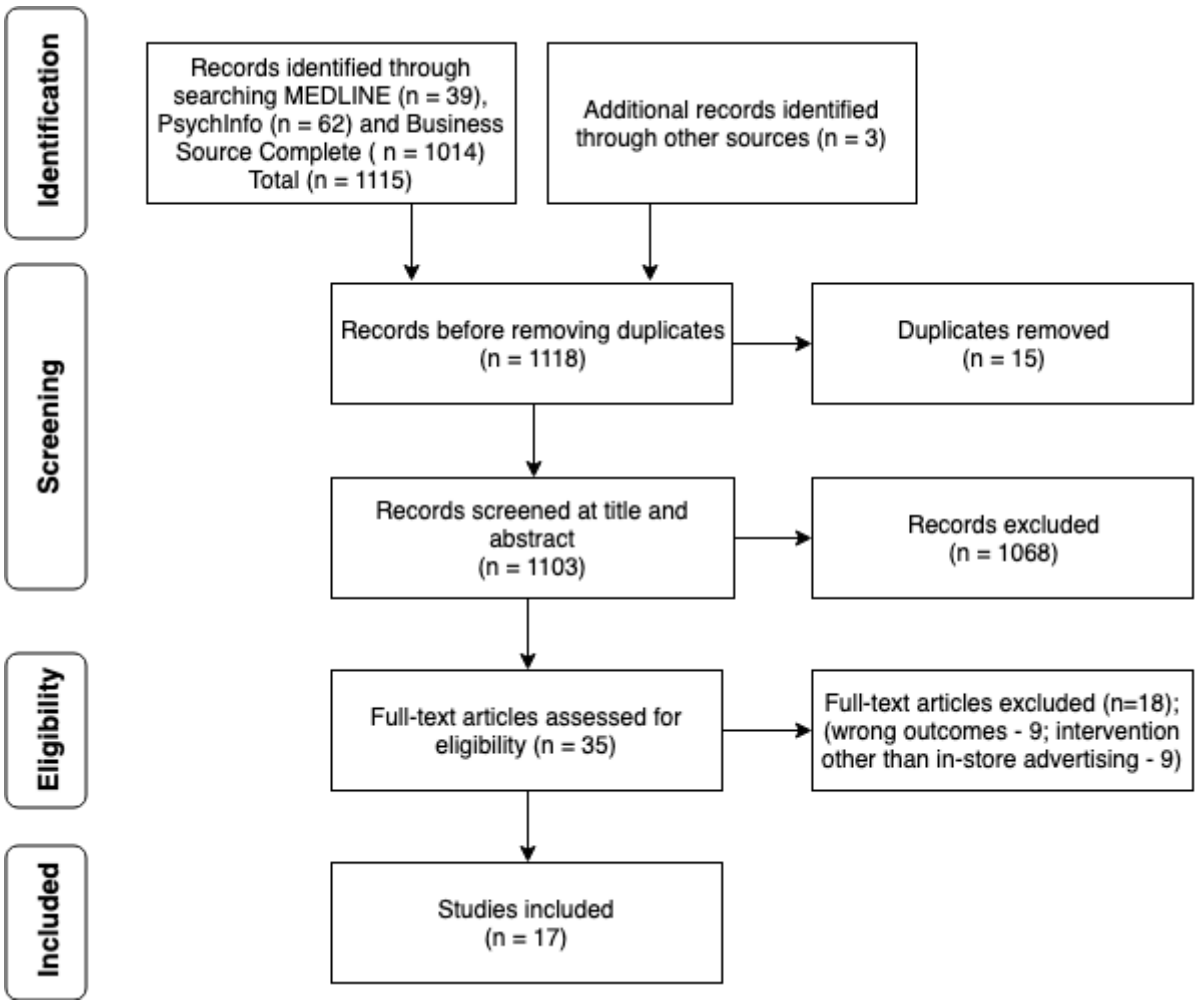

Figure 1. PRISMA flow chart for selection of studies (Moher et al., 2009). Additional records (n = 3 were identified through consulting topic experts.

The search identified 4 systematic reviews and 13 original studies. Systematic reviews included mostly evidence from the USA, other English speaking countries and European countries. Therefore they were assumed to be probably relevant – due to cultural and economic similarities – and should apply to Scotland (rated B).

Original studies included 7 non-randomised or pre-post trials, 4 cross-sectional studies, and 2 RCTs. The majority of them were from the USA (6), 2 studies conducted in both France and Sweden, and single studies from Germany, Iceland, Denmark South Africa and China. Although none of the identified individual studies were solely UK-based, 7 were probably relevant – due to cultural and economic similarities – and should apply to Scotland (rated B). The remaining 6 studies were possibly relevant, non-UK and should be interpreted with caution due to strong cultural or institutional differences (rated C). The nature of the evidence for each question was assessed according to the hierarchy of evidence shown in Table 5 below.

Two papers identified by the search for this evidence overview were also included in the identified systematic review: 2 systematic reviews[11, 12] included the study by Thorndike et al (2012) and another systematic review [13] included the study by Sigurdsson et al (2014).

Additionally, the identified systematic reviews shared some of the studies. The review by Cameron et al (2016) shared 11 papers with Hartmann-Boyce et al (2018) and 8 studies with Adam and Jensen (2016). The review by Adam and Jensen shared 5 studies with the review by Hartmann-Boyce et al (2018). Finally, the review by Bucher et al (2016) shared one study with Cameron et al (2016) and one with Hartmann-Boyce (2018).

Table 5. Strength of evidence table (higher to lower)

Study design	Some Characteristics	Evidence strength	Number of included studies
Systematic reviews and meta-analysis level evidence	Focused clinical question, comprehensive sources and explicit search strategy, selection based on specified criteria, rigorous critical appraisal, qualitative summary of results	1	4
Scoping and narrative review level evidence	Not systematically conducted. Summarizes a topic that is broad in scope	2	0
Randomized Controlled Trial (RCT)	Control of various aspects of the research; it is possible to identify causal links between interventions and outcomes of interest	3	2

Cohort studies (Longitudinal)	Non-controlled environment and no intervention. Following through time; it is possible to identify risk and protective factors	4	0
Non-randomised and pre-post trials	Give preliminary information about the effectiveness of an intervention. Results may be biased due to the lack of randomisation or a control group	5	7
Cross-sectional studies	Give information about a population at a given point in time to determine prevalence. They can infer correlations but not associations of causality	5	4
Qualitative studies	Typically smaller sample sizes than quantitative research. Methodologies such as interviews, focus groups, ethnography, among others. Data can include texts, images or videos. Can provide information about acceptability and feasibility of interventions	7	0
Total			17

9 papers investigated purchases or sales in general and 2 intention/motivation to purchase. A further 5 focused on impulse buying and 1 on impulse purchase tendency. Although the search terms included online environment and the out of home food sector, all eligible studies applied to physical retail stores only; therefore, no evidence on in-store marketing in online stores was identified in this evidence overview.

Types of investigated in-store advertising included: location of products in store (including checkouts or shelve space and arrangement), posters and displays, labels or signs on shelves, in-store samplings/ tastings/ demonstrations, and mobile advertising to facilitate sales in a physical retail environment.

In-store advertising and purchases

Within 11 identified studies that focused on the effect of in-store advertising on purchases there were 4 systematic reviews[11–14] that included studies from the USA and European countries, as well as from Canada, New Zealand, Australia, South Africa, Japan and China (Table 7). Individual studies were conducted in the USA,[3, 15–17] Denmark,[18] Iceland[19] and Germany.[20] None of the identified research came from Scotland, but 8 of the studies were probably relevant due to cultural and economic similarities.[11–14, 16–18, 20] A further 3 studies were possibly relevant but should be interpreted with caution due to coming from a minority community[15], being published 5 decades ago[3] or cultural differences.[19]

The evidence was relatively strong coming from 4 systematic reviews,[11–14] 2 RCTs,[15, 16] 4 non-randomised trials[3, 18–20] and 1 cross-sectional survey.[17] 6 studies focused on healthy foods,[13–16, 19] 3 on groceries in general,[11, 12, 18] 1 on tea (tea leaves or teabags),[3] and 1 on wine.[20] Interestingly, all but one of these studies were published within the last 5 years. The 'outlier' was from 1969.[3]

Types of in-store advertising considered in the identified papers included location (end of aisle, checkouts or proximity to the product in case of mobile advertising), placement (i.e. shelf height and position in reference to similar items), (i.e. number of varieties or quality), and other non-monetary promotions such as amount of allocated shelf space, shelf labels, and signage (i.e. posters or banners). One systematic review included interactive promotions such as demonstrations, tastings, store tours, games, audio and video announcements or information sessions.[14]

Overall, this evidence suggests that in-store advertising influences types and volume of purchases of advertised food and drink. The strongest evidence comes from the 4 systematic reviews[11–14] that reported effects of in-store advertising on the choice of healthier foods. Most of the studies included in the 4 systematic reviews showed positive effect of in-store advertising on purchases (Table 6). Among the studies that showed no effect, the majority had either weak study design or low quality (Table 6).

Table 6. Effects of experiments summarised in the identified 4 systematic reviews[11–14]

Study	Total number experiments included	Number and characteristics of experiments that showed **positive** effect	Number and characteristics of experiments that showed **no impact and/or negative impact**
Adam and Jensen, 2016	n = 42 health interventions in physical food stores (including price)	n = 36 (86%)	n = 6 3 of them were of good quality and low risk of bias
Cameron et al, 2016	n = 50 studies of supermarket interventions related to nutrition (excluding labelling and price)	n = 35 (70%) out of those 24 studies were rated as high quality and 11 as moderate quality	n = 14 no or minimal impact 11 of those did not have a strong study design, large sample or had minimal duration in comparison to other interventions 3 had strong designs but were either minimal in scope, or required customers to engage in fairly complex and lengthy nutrition education messages, or related to retailer's 'own brand' products (for which product healthiness was a

			smaller driver of consumer behaviour) n = 1 negative impact; this this study labelling of microwave popcorn with low fat and low calorie shelf labels decreased sales, it was likely related to perceived poor taste
Bucher et al, 2016	n = 18 studies where food position or order was manipulated	n = 16 (89%) effect: participants chose healthier foods	n = 2 no impact In these experiments "the degree of manipulation was only a minor change in position with all the food remaining within reach".
Hartmann-Boyce et al, 2018	35 studies out of which **11 were environmental** that did not involve economic component	n = 7 (64%)	n = 4 no significant effect Quality of 2 of them was unclear. Out of 2 studies of high quality one involved school students, and one a combination of signage, shelf height, consumer education and advertising.

Among individual studies, two RCTs[15, 16] and two non-randomised trials[3, 19] reported increased purchases or sales of products advertised in-store. In an RCT by Gustafson et al (2018) point of decision prompts focusing on fresh produce (in the form of a poster on an easel just inside the entry to the store) compared to control group, resulted in 60% more fruit and vegetable purchases and 62% bigger spend on fruit and vegetables.[15] It also resulted in 49% more healthy products purchased and 52% higher spend on healthy products. In an RCT by Thorndike et al (2017), improved visibility and quality of fresh produce (choice architecture) resulted in $US 40/month higher spend on fruit and vegetables compared to baseline; at the same time, in control stores with no intervention, spend on fruit and vegetables decreased by $US 23/month compared to baseline. It has to be noted, however, that the two above RCTs were conducted in low-income communities in the USA and their results may not directly apply to the Scottish context.

Effects of the two non-randomised trials were also considerable. Sigurdsson and colleagues (2014) documented a substantial increase in sales of healthy products and decrease in the sales of unhealthy products by placing and removing them, respectively, from the checkout areas. Specifically, sales of sugary gum and pastilles decreased by 29% by removing them from the checkout.[21] However, a caution was made that the effect may vary over time and as other variables may be at play, more research was needed. Also showing the importance of placement, Hubbard (1969) reported that sales of tea were significantly improved by moving products to the eye level position on the shelves.[3]

Finally, one cross-sectional survey[17] and one non-randomised trial conducted in laboratory settings[20] reported that in-store advertising increased motivation or intention to make a purchase. The cross sectional survey by Moore et al (2016) reported which features in grocery stores motivated shoppers to buy healthy foods. While economic interventions of in-store specials or coupons motivated 20.1% of shoppers, non-monetary in-store interventions were almost as effective: availability of convenient, ready-to-eat healthy foods (18.8%) and labels and signs on shelves (14.6%). None of the studies investigated real purchases compared to purchase intention.

In-store advertising and impulse / unplanned buying

Impulse buys were explained to participants in one of the identified studies as follows: ‘‘an impulse purchase occurs when you make a sudden unexpected decision to buy something while shopping in the store. It is different from planned purchases (for example, a grocery list) and from an unplanned reminder purchase — remembering you need something when you see it in the store. Impulse purchases are spontaneous decisions to buy something with no prior recognized need.”[22] Impulse buys can be calculated as a difference between the value of items that were intended to be bought (including unplanned reminder purchases) and the total spending,[22–24] or it can be self-reported by research participants.[25–27]

In this evidence overview, 6 identified studies focused on impulse buying: 2 from US,[22, 23] 2 from both France and Sweden,[25, 26] and one each from South Africa[24] and China[27] (Table 8). Four of these studies were published within the last 8 years, 1 in 2004[28] and 1 in 1990.[24] The strength of evidence for these studies was weaker than for the evidence on purchases summarised above.

Among studies that focused on food and drink there was 1 before and after trial,[23] 1 non-randomised non-controlled trial[22] and a cross-sectional survey.[25] While all of these studies indicated positive effect of in-store advertising on impulse purchases of food, it is difficult to make any statements because of weakness of this evidence.

In their non-randomised, non-controlled trial, Kacen et al (2012) suggested that impulse buying behaviour was best encouraged by attracting customers’ attention to emotionally appealing products, implicating that some products may be better candidates for impulse buys.[22] They found that product characteristics had a 50% greater influence on impulse buying than retailing factors. Among retailing factors, special displays encouraged impulse buys but their effect was smaller compared to pricing strategies.[22]

The importance of exposure on unplanned spending was evident in the before and after study by Hui et al (2013) who reported that increasing in-store path length, meaning a total distance covered inside the store, could increase unplanned spending[23]. In this experiment, increase in path length was achieved by a targeted mobile promotion – direct personalised offers on shopper’s smart phones.

Among studies that focused on items other than food, or for which focus was not clear, there were 2 cross sectional surveys and 1 before and after trial. The frequency of exposure to in-store promotion was suggested to have a significant effect on impulse purchase tendency by a cross-sectional study looking at fashion.[26] The study reported that interactive effects between the 3 promotional channels (in-store promotion, TV commercials and direct mail marketing) increased shoppers' general impulse purchase tendency.

Finally, 2 separate studies looking at impulse buying cautioned that this effect may be different for different countries due to cultural differences.[24, 25]

Table 7. Characteristics of included studies where outcomes included purchases

Lead Author(s) Date	Study design	Population, geographical scope, focus	Main Outcomes / Aim	Relevant results	CR	MQ	MR	TR	WoE
Adam and Jensen 2016 [29]	Systematic review 42 studies (2003-2015); study samples ranged from 37 supermarket customers to more than 200,000. (none of the papers below)	Adults visiting grocery stores, convenience stores in USA, Canada, New Zealand, The Netherlands, France, Australia, Norway and South Africa (various locations and socioeconomic levels) Focus: food and drink	adopting healthier food purchasing/ consumption behaviour Aim: to investigate the effectiveness of food store interventions intended to promote the consumption of healthy foods and the methodological quality of studies reporting them	Most interventions used a combination of information (e.g. awareness raising through food labelling, promotions, campaigns, etc.) and increasing availability of healthy foods such as fruits and vegetables. Few used price interventions. The average quality score for all papers is 65.0%, or an overall medium methodological quality. Apart from few studies, most studies reported that store interventions were effective in promoting purchase of healthy foods.	B	2	1	2	2
Cameron et al 2016 [14]	Systematic review 49 papers reporting 50 studies	74% of the studies conducted in the USA; others included the Netherlands, Australia, Canada, UK, Japan and Norway Focus: food	food purchasing, food consumption or body weight Aim: to conduct a systematic review of the effectiveness of supermarket-based interventions involving product, promotion or place, on the healthiness of consumer purchases	Positive effects were observed in 35 studies (70 %). Of the 15 studies that reported null or negative findings, most (n = 12) did not have a strong study design, large sample size or duration longer than 1 month.	B	1	1	2	2

Bucher et al 2016 [11]	Systematic review 15 papers including 18 studies	10 studies were conducted in the USA; other included the Netherlands and other European countries Focus: food	Food choice (sales or consumption) Aim: evaluate the effect of positional changes within microenvironments on food choice	This review has identified that manipulation of food product order or proximity can influence food choice. Such approaches offer promise in terms of impacting on consumer behaviour.	B	2	1	2	2
Hartmann-Boyce et al 2018 [12]	Systematic review 35 studies representing 89 interventions	>20,000 participants and >800 stores; healthy weight and overweight individuals across all age groups 18 studies were conducted in the USA, 6 in the Netherlands, 3 in Australia and New Zealand, and 1 each in Canada, China, France, Sweden & the UK. Focus: food	purchasing Aim: to understand the effectiveness of interventions in grocery stores to aid the development of strategies to improve public health and to reduce inequalities	Findings suggest that interventions implemented in grocery stores—particularly ones that manipulate price, suggest swaps, and perhaps manipulate item availability—have an impact on purchasing and could play a role in public health strategies to improve health.	B	2	1	2	2
Thorndike et al 2017 [16]	RCT, pilot study (store exit interviews) Intervention: improved visibility	n=525 from low-income families participating in the Special Supplemental	Primary: WIC fruit/veg voucher and non-fruit/ veg voucher sales Secondary: self-reported fruit/veg purchases	During the intervention period, WIC fruit/vegetable sales increased in intervention stores by $US 40/month but decreased in control stores by $US 23/month (difference in trends: $US 63/month; 95% CI 4, 121	B	2	1	2	2

	(**placing at the front of store**) and quality of fresh produce (choice architecture)	Nutrition Program for Women, Infants, and Children (WIC) USA Corner stores Focus: fruit and vegetables	Aim: to determine if improving the visibility and quality of fresh produce (choice architecture) in corner stores would increase fruit/ veg purchases	$US/month; P =0·036); WIC non-fruit/ vegetable sales were not different (P=0·45). Comparing baseline and intervention-period exit interview responses by customers participating in WIC (n 134), intervention store customers reported increased fruit/vegetable purchases compared with control store customers (18 v. −2 %), but this did not achieve statistical significance (P =0·11).					
Clement et al 2015 [30]	Non-randomised trial 1: 2x2 experiment (Lab setting); eye-track experiment looking at effects of signage & placement on visual saliency and intended choice **2: 2x2 experiment (real life store); in-store manipulations of signage and placement on shelves in 10 stores over 6 weeks**	1: n-80; 4x20 females (20-45 y.o.) 2: n= 10 stores; in-store manipulations of signage and placement on shelves over 6 weeks Denmark Focus: groceries	1: intended choice 2: volume sales Aim: to investigate the visual saliency from two factors: A) in-store signage and B) placement of products	Relative placement and use of signage at the point of purchase in relation to a choice between private labels and national brands affects both visual attention and final product choice. Specifically: 1) Optimal placement (different brands together, here branded and private label) of two comparable goods increased visual attention and sale for both goods. 2) The use of signage increased visual attention and sale as well, yet only for the product that the label addressed, implying a cannibalization* effect. * cannibalization – a reduction in sales volume, sales revenue, or market share of one product as a result of the introduction of a new product by the same producer	B	2	1	2	2

Bues et al 2017 [20]	Non-randomised trial 2×2×2 between-subject experimental design (8 groups) An in-store adv. message involving a price promotion (30% discount vs. no discount), the location at which a message was received (at the store entrance and relatively far from the product vs. at the shelf and near the product), and personalization (personalized message vs. all app users getting the in-store message).	n=1394 Germany Focus: wine laboratory settings only, needs to be confirmed in real life	Purchase intention Aim: to investigate effect of mobile in-store advertising (through 3 value drivers: price promotion, location, and personalization) on purchase intention	All three value drivers increase purchase intention. Surprisingly, the authors find that price promotions are the least important value driver, whereas the location of receiving a mobile ad is the strongest driver of purchase intention. An interaction effect between location and personalization was also found to be significant. Personalization close to the product has little impact on purchase intention.	B	2	1	3	3
Moore et al 2016 [17]	Cross-sectional web-based health attitudes and behaviours survey (ConsumerStyles)	n=4242 adults USA Focus: healthful food	Motivation to purchase of more healthful foods Aim: to explore which grocery store features consumers reported that motivated more healthful purchases	Features in grocery stores shoppers reported motivated them to purchase more healthful foods in the past month: in-store coupons or specials (20.1 %), availability of convenient, ready-to-eat more healthful foods (18.8 %), product labels or advertising on packages (15.2 %), and labels or signs on shelves that highlighted more healthful options (14.6 %). Frequent shoppers reported being motivated to purchase more healthful foods by in-store	B	2	2	2	2

				tastings/recipe demonstrations and coupons/ specials more often than infrequent shoppers.					
Gustafson et al 2018 [15]	RCT	n=653 transactions The USA, rural, low-income, minority community Focus: healthy foods or fruit and vegetables only	Purchases Aim: to examine the potential for point-of-decision prompts (PDPs) to promote healthier food choices (posters were displayed on an easel just inside the sole entry point into the supermarket)	Shoppers exposed to the narrow PDP (focused on fresh produce only) consistently purchased more healthy foods than shoppers in a control group, while shoppers in the broad PDP (focused on any healthy items) did not, highlighting the importance of considering cognitive processes when designing health promotion messages.	C	3	2	2	2
Hubbard et al 1969 [3]	Before and after (national stats used as before) with 2 conditions: shelf arrangements, investigated. "Structured observations of tea purchasing during peak shopping periods"	Random sample of stores in Houston (Texas, USA) – n=22 (25% of all 4 chains selling tea) Focus: tea	Tea sales Aim: to investigate sales of tea depending on the shelf allocation and shelf-arrangement and to investigate effectiveness of in-store merchandising techniques	A direct relationship was found between shelf-allocation and sales (specifically, significant sales increases were accomplished principally through improvement in the merchandise's shelf allocation and placement). Additionally, sales variations accompanied differing shelf-arrangements of merchandise. Both shelf-arrangement and shelf-allocation are important for sales.	C	2	2	2	2
Sigurdsson et al 2014 [31]	Non-randomised trial An alternating treatments design embedded in a multiple baseline design across stores	n=100,000 shoppers in 2 stores (convenience and discount) Iceland Focus: healthy food	Sales of relocated products Aim: to examine both the immediate and enduring sales effects of modifying the typical in-store shelf placement of food items at the	Results suggest that placing healthy food items at the store checkout (prominent discriminative stimuli) can lead to a substantial increase in sales of these products. Adding an advertisement at the point of purchase did not lead to a meaningful increase in sales beyond that obtained from the product relocation alone.	C	2	2	2	2

			checkout, with or without an in-store advertisement.						

Table 8. Characteristics of included studies where outcomes included impulse or unplanned buying

Lead Author(s) Date	Study design	Population, geographical scope, focus	Main Outcomes / Aim	Relevant results	CR	MQ	MR	TR	WoE
Hui et al 2013 [32]	Before – after study design Store entrance survey of planned purchases and spending compared to the trip's transaction records	1: n=275 shoppers, medium-sized grocery store, US city *2. (does not apply to this evidence overview)* Focus: any goods for in the grocery store	Unplanned spending Aim: to estimate the direct effect of in-store travel distance on unplanned spending	1: Targeted mobile promotions aimed at increasing in-store path length can increase unplanned spending. *2: (does not apply to this evidence overview)*	B	2	1	2	2
Kacen et al 2012 [22]	Non-randomised and non-controlled trial Grocery shopping panel study: participants filled in questionnaires about 3 major shopping trips, including receipts with circling impulse buys	N=51 shoppers, (3 trips each); 3979 items purchased of which 9% were impulse buys USA Focus: groceries	Impulse purchases Aim: to model the relative contribution of product and retailing factors to the impulsive purchase decision To help marketers determine the in-store factors that impact	The results indicate that product characteristics have a 50% greater influence on impulse buying than retailing factors. Of the three product characteristics investigated, the hedonic nature of the product has the greatest influence on impulse buying. Of the 3 retail factors, a store environment with a high–low pricing strategy (as opposed to everyday low price) influences impulse buying the most.	B	2	2	2	2

			purely spontaneous purchases of items that otherwise would not end up in the shopping cart.	A product on special display is more likely to be impulsively bought than an item not on display when it was planned to be bought / on shopping list or was considered as needed before the shopping; display does not matter for no-buy vs impulse purchase situations. The findings suggest that retailers who want to encourage impulse buying behaviour utilize promotional activities and merchandising tactics that attract consumers' attention to emotionally appealing products.					
Hulten and Vanyushyn 2014 [26]	Cross-sectional store face-to-face survey asking how often shoppers made impulse purchases when shopping for clothes.	n=493 questionnaires (161 Sweden, 332 France) France and Sweden Focus: clothes	Impulse purchase tendency Aim: to investigate how promotion through channels such as direct-mail marketing, TV commercials and special in-store displays affects consumers' impulse purchases of clothes	There are interactive effects between the three promotional channels (in-store promotion, TV commercials and direct mail marketing) that increase shoppers' general impulse purchase tendency. Furthermore, the frequency of exposure to in-store promotion has a significant effect on impulse purchase tendency. Shoppers with a positive attitude towards direct-mail marketing and TV commercials also respond positively to in-store promotion.	B	2	3	3	3
Abratt and Goodey 1990 [4]	Before and after survey (interview before to record purchase intentions and after shopping with records of actual	n=450 South Africa, 15 major supermarkets – compared with similar studies in the USA and UK	Impulse buying Aim: to determine the effectiveness of in-store stimuli and the extent to which they influence consumer purchasing behaviour; and the efficiency of resources	In-store stimuli affect unplanned purchasing significantly. Controllable promotional techniques, point-of-sale material, shelf signs, end-of-aisles displays, and special displays received 70% of total mentions. 25% of unplanned purchases were made because the respondent 'remembered a need' for the product.	C	2	2	2	2

	purchases and reasons for selection)	Focus: non-food items	designed to stimulate additional sales	The findings indicate that unplanned buying is higher in the United States than in South Africa, but that the importance of in-store stimuli holds true across cultures.					
Hulten & Vanyushin 2011 [25]	Cross-sectional survey (questionnaire)	n=202 Swedish and n=368 French households France and Sweden Focus: groceries	Impulse purchases Aim: to identify similarities and differences with regard to factors affecting consumers' impulse purchases of groceries in France and Sweden.	In-store promotion (incl. special point-of-purchase in-store displays) is an effective promotion tool, which increases impulse purchases. While Swedish shoppers make more impulse purchases, the French consumers appear to be more attentive to special in-store displays and two-for-the-price-of-one offerings. Contrary to expectations, the impulse purchases of French and Swedish shoppers are not predicted by gender. Although the behaviour as such is universal, there may be differences between countries with regard to the number of impulse purchases that shoppers make and how they respond to special in-store displays and discount offerings. Observed differences in impulse shopping behaviour can be traced to both culture and typical assortment of products carried by a store. Our findings demonstrate that low income increases the likelihood of impulse purchases. However, this was unrelated to promotional activities.	C	3	2	2	3
Abratt and Goodey 1990 [4]	Before and after survey	n=450	Impulse buying	In-store stimuli affect unplanned purchasing significantly. Controllable promotional techniques, point-of-sale material, shelf signs,	C	3	2	2	3

	(interview before to record purchase intentions and after shopping with records of actual purchases and reasons for selection)	South Africa, 15 major supermarkets – compared with similar studies in the USA and UK Focus: non-food items	Aim: to determine the effectiveness of in-store stimuli and the extent to which they influence consumer purchasing behaviour; and the efficiency of resources designed to stimulate additional sales	end-of-aisles displays, and special displays received 70% of total mentions. 25% of unplanned purchases were made because the respondent 'remembered a need' for the product. The findings indicate that unplanned buying is higher in the United States than in South Africa, but that the importance of in-store stimuli holds true across cultures.					
Zhou and Wong 2004 [28]	Cross-sectional survey on shoppers exiting the mall	n=255 Supermarkets China, affluent region Focus: not clear	Impulse purchases Aim: to investigate the effects of in-store point-of-purchase (POP) posters on self-reported consumer impulse purchases on the day the survey	In-store POP posters can elicit impulse buying through two separate processes: informative and experiential (therefore in-store POP posters should not only feature discounts and cheaper pricing information [promotional effect], but also engage in stimulation of the shopping environment [atmospheric effect]). Low income increases the likelihood of impulse purchases: the analysis suggests that household income is negatively associated with impulse purchase, while all the other demographic variables have little relevance. One plausible explanation is that Chinese shoppers with relatively low levels of household income are more reactive to factors leading to impulse buying than those with higher levels of household income.	C	3	2	3	3

Policy and managerial implications

Authors of the identified studies, based on the results of their research, suggested implications for public health policy as well as implications for retail managers; all are presented in Tables 9 and 10.

Implications for policy come from all identified systematic reviews (n=4) and RCTs (n=2), as well as from one non-randomised trial and one cross-sectional survey (Table 9). All identified studies that included policy implications focused on ways to promote sales or purchases of healthier products.

The systematic reviews, the strongest evidence found for this evidence overview, were all rated to be probably relevant to the Scottish context because included evidence came from countries of similar culture and economy to Scotland. Policy implications from these papers included use of in-store advertising, especially those improving access, availability and visibility, to promote purchases of healthier foods (Table 9). Two studies provided implications from research involving low-income communities and families: point of decision prompts and stocking and prominently displaying good quality healthy produce.[15, 16]

9 out of 17 identified papers included managerial implications. While their focus was not improving health but increasing sales, and they did not specifically focus on healthy food but on food in general,[3] food and other products,[23] products high in sugar, salt or fat,[18] alcohol[20] or other that food products,[24, 26] they also suggested the use of strategies improving access to, availability of and visibility of products to promote purchases.

Specifically, 4 of the papers explored placement and location of goods, sales of which were to be increased.[3, 18, 20, 27] 2 papers recommend tailoring of in-store advertising by acknowledging specific cultural contexts and characteristics to maximise impulse buys.[24, 25] 1 recommended increasing path length in-store through targeted mobile messages and therefore increasing exposure to any in-store advertising and products sold.[23] Another paper suggested that in-store promotions were more effective at stimulating impulse buys if they made shopper recall messages communicated through other tools.[26] Finally, a paper proposed that in-store advertising was not the most important to generate impulse buys; they proposed that adding more hedonic, low-price items to the retail assortment would generate more impulse buys.[22]

Table 9. Implications for policy

Study ID	Policy implications
Adam and Jensen 2016 *(systematic review)*	Food store health interventions generally work, especially if they combine multiple components. Price incentives appear to be a powerful supporting mechanism in such combinations. Interventions which combine price, information and easy access to and availability of healthy foods with interactive and engaging nutrition information, if carefully designed can help customers of food stores to buy and consume more healthy foods.

Cameron et al 2016 *(systematic review)*	Interventions targeting the in-store supermarket environment have considerable potential to change population diets and social norms around what is a healthy diet. Shelf labelling using nutrition summary scores may be a particularly promising intervention target.
Bucher et al 2016 *(systematic review)*	Manipulation of food product order or proximity can influence food choice. Such approaches offer promise in terms of impacting on consumer behaviour.
Hartmann-Boyce et al 2018 *(systematic review)*	Interventions implemented in grocery stores—particularly ones that manipulate price, suggest swaps, and perhaps manipulate item availability—have an impact on purchasing and could play a role in public health strategies to improve health.
Gustafson et al 2018	The study provides evidence of the feasibility of using a low-cost point-of-decision prompts to increase healthy food purchases in a low-income, minority community.
Thorndike et al 2017	New policies that incentivize stores to stock and prominently display good-quality produce could promote healthier food choices of low-income families.
Sigurdsson et al 2014	Results suggest that placing healthy food items at the store checkout can lead to a substantial impact on sales of these products.
Moore et al 2016	Enhancing the visibility and appeal of more healthful food items in grocery stores may help improve dietary choices in some populations but additional research is needed to identify the most effective strategies for interventions.

Table 10. Managerial implications

Study ID	**Implications for retail managers**
Clement et al 2015	Placement of a private label and a branded product within a category can be an advantage: it works through increasing the visual attention and for some categories it positively influences the total sale in a category.
Hubbard 1969	Both shelf-arrangement and shelf-allocation are important for sales.
Bues et al 2017	Managers who aim to improve the effectiveness of mobile in-store advertising campaigns should invest in localizing mobile in-store ads (when an ad is received close to the product); the main effect is higher and the cost is likely to be lower than personalization (when an ad sent to specific people only).
Hui et al 2013	Targeted mobile promotions aimed at increasing in-store path length can increase unplanned spending.
Hulten and Vanyushyn 2014	Retailers can benefit from the synergy effects that the external promotional channels generate. Consequently, retailers need to design their in-store promotion in ways that make shoppers recall messages communicated through other tools. Helping shoppers recall positive memories of the commercial messages that induced them to visit the shop may thus increase the effectiveness of a shop's in-store promotion.
Kacen et al 2012	To increase impulse buying behaviour in their stores, retailers should carefully scrutinise their product inventory with an eye toward increasing the number of products with positive impulse characteristics: emotionally appealing, lower-priced items. Affective desire for a product appears to be the key driver of impulse buying behaviour. While both product and retailer variables contribute to the likelihood of a shopper making an impulse purchase, all other things equal, adding more

	hedonic, low-price items to the retail assortment will generate more impulse buys than will adding more sale items or merchandising displays.
Hulten and Vanyushyn 2011	While impulse buying is universal, differences in impulse buying activity can be explained by cultural factors, range of product variety offered within a store and the impact of promotional measures. Further analysis of country-specific characteristics is recommended.
Abratt and Goodey 1990	Both manufacturers and retailers have the opportunity to increase their sales and respective market shares if they better understand what influences consumer purchasing. It is recommended to evaluate to what extent in-store stimuli generate purchases in specific cultural contexts.
Zhou and Wong 2004	In-store point of purchase posters can affect consumer impulse purchase behaviour. Such posters should not only feature discounts and cheaper pricing information, but also engage in stimulation/enhancement of the shopping environment.

Discussion points

The search strategy was not restricted to specific years and the selected papers included two published decades ago,[3, 24] indicating that in-store advertising is not new and has been utilised by retailers for a long time. Kacen et al (2012) referred to research published in the 1990s showing that in-store promotions increased sales volume because of an increase in impulse purchasing behaviour.[33–35]

Context relevance of the included in this evidence overview studies is important, especially in the light of the recommendations to acknowledge cultural characteristics in in-store advertising. None of the studies were conducted in Scotland but 11 out of 17, including all 4 systematic reviews, were probably relevant: non-Scottish based but due to cultural and economic similarities should apply to Scotland.

Main finding

All papers included in this evidence overview, focusing on food but also on other goods, suggested in-store advertising increased sales or stimulated impulse buys, at least to some extent. This is not surprising given the popularity of these strategies: it would be difficult, if not impossible, to find a grocery store in Scotland that does not use them.

Further supporting the above finding, an unpublished systematic review (currently undergoing peer review) which included 38 studies published between 2005-2019, concluded that there was moderate evidence from observational and intervention studies that greater availability and more prominent placement of healthy foods, or reduced availability and less prominent placement of unhealthy foods, is related to healthier dietary-related behaviours based on the outcomes of diet, sales and BMI.[36]

The main finding of the current evidence overview could be considered in the light of the information from the Grocery Manufacturers Association (GMA) report about varying effects of different tactics on product categories.[37] Based on a marketing survey of 3,600 respondents, the GMA reported "much higher incidence of impulse purchases in the food & beverage category (73 per cent of shoppers making at least one impulse purchase per trip) as compared to the household products and health & beauty categories (41 per cent and 39 per cent, respectively), shelf signage and end-cap displays are nearly twice as effective in the food & beverage category."[37]

Implications

Although all identified papers explored effects of in-store advertising, three of them concluded with suggestions related to, but not specifically about, in-store advertising. Two papers concluded that while importance of in-store advertising holds true across cultures, degree of impulse buying may vary; therefore, they advised analysis of country-specific contexts and characteristics for maximising effect on in-store advertising.[23,24] Abratt and Goodey (1990) reported unplanned purchase behaviour in South African supermarkets and after comparing with the reports from the USA and the UK, concluded that they were lower, but still significant, in South Africa. They also suggested that variables such as brand loyalty or presence of shopping list may be different between countries.[24] Hulten and Vanyushyn (2011) in their cross-sectional survey collected data from over 500 Swedish and French households. They observed that Swedish shoppers made more impulse purchases but the French consumers appeared to be more attentive to special in-store displays and two-for-the-price-of-one offerings. However, as only 2 papers highlighted the issue of cultural differences, it is difficult to propose which influences are similar no matter the country and where the key differences could lie.

Another paper in which the conclusion was not directly related to in-store advertising suggested that more impulse buys could be generated by stocking more "hedonic, low-price items" than adding more sale items or merchandising displays.[22] Ubiquitous presence of relatively low-priced products high in fat, sugar and salt suggests that retailers are familiar with this knowledge. The high prevalence of diet-related diseases in Scotland requires urgent actions to improve the food environment. While restricting the choice of products available is not feasible, lowering visibility and attractiveness of products not conducive to health may be next best thing.

The fact that more than half of the identified papers included a section on, or mention of, managerial implications (one study included a separate executive summary and implications for managers and executives, see Table 10) suggests that this is knowledge valuable to retailers. Interestingly, none of the papers with managerial implications focused on increasing sales of healthy products only. In contrast, all papers that included public health policy recommendations (Table 9) focused on promoting sales of healthier products. This revealed that the topic of in-store advertising keeps attracting the attention of two groups with different agendas.

Limitations

A number of limitations within the included studies and the reviews should be recognised when reading this evidence overview and interpreting the findings. Firstly, as this was an evidence overview, there will likely be studies of relevance that have not been included, even though a systematic strategy was undertaken and an effort made to find relevant papers and information. Second, following initial duplicate removal, only one researcher screened titles and abstracts, did quality appraisal and applied context relevance scoring. Third, none of the studies were conducted in Scotland. Although it can be assumed that direction of the effect of in-store marketing on purchases and impulse buying will be similar in Scotland, as the effect was consistent across a range of countries. Fourth, the approach to assessment of the quality of evidence allowed only general estimates. While this was a quick and useful approach for this evidence overview, it did not provide full assessment of methodological quality and risk of bias in the included studies. Finally, no studies considering online in-store advertising or advertising in the out of home setting were identified.

Conclusions and recommendations

The knowledge of effectiveness of in-store advertising is not new, based on both the dates of publication of the identified papers and on ubiquitous implementation of these strategies in physical and online retail in Scotland.

This evidence overview indicates that in-store advertising is likely to promote sales of food and drink and other products. Strategies used in the included papers focused on placement, availability, shelf labels and signage.

The identified systematic reviews suggested in-store advertising, especially combined with pricing strategies, as one of the public health policies to improve population's diet and health.

The identified evidence on impulse purchases was weaker than on sales/purchases in general, but there seemed to be an indication that in-store advertising could stimulate impulse purchases. The effect of in-store advertising on impulse buys may be different in different cultures and contexts; therefore, to explore the size of effect of specific strategies in Scotland, investigations should be conducted in this setting. Additionally, the effect of in-store advertising on impulse buys may be stronger for groceries than other goods.

Although the exact effect size of different in-store advertising strategies is not known for Scotland, based on the available evidence, the general direction of the relationship between in-store advertising and purchases or impulse buys can be accepted.

No research was identified on the effect of online in-store advertising or the effect of in-store advertising in the out of home sector. While this may be due to the limitations of this evidence overview, it may have also highlighted a gap in the literature.

The findings of this evidence overview should be interpreted in the light of these limitations.

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Appendix 1. Excluded studies with reasons

Lead Author(s) Date	Study design	Population	Outcomes/ Variables	Findings	Reasons for exclusion
Anderson et al 1997	Randomised controlled trial	230 shoppers from 2 stores, of which 127 completed the intervention	A supermarket-based intervention (Nutrition for a Lifetime System (NLS©)) designed to alter **the nutritional content of individual shoppers' supermarket food purchases** as reflected on their supermarket receipts.	NLS treatment contributed to lower levels of total fat and to **higher levels of total fibre and servings of fruits and vegetables at post-test**.	Intervention other than in-store advertising; NLS intervention was a series of 10 program segments introduced weekly. Segments were presented by interactive software on a computer in a kiosk at the supermarket. This is different to in-store advertising.
Burton et al 1999	Pre-post study	The USA	number of advertised products purchased, the amount spent on these products, the number of coupons redeemed, and the total number of products purchased	Exposure to the **advertising sale flyer** for retail supermarkets is significantly and positively related to the number of advertised products purchased, **the amount spent on these products**, the number of coupons redeemed, and the total number of products purchased. Using the no advertising exposure condition as a baseline, **exposure to the advertising sale flyer results in more than a 100 percent increase in the number of advertised products purchased** and dollar amount spent on promoted products.	Intervention other than in-store advertising; Flyer included sale price information and coupons (could be more price promotion)
Caruso et al 2016		Australia	Foot traffic	The most prominent endcaps, in terms of both foot traffic and	Wrong outcomes

				visual reach, were at the back of the store. These had 24 percent more foot traffic and 30 percent more visual reach than front endcaps. Evidence from this study will help marketers reach more shoppers in different endcap locations in the supermarket.	
Chandon et al 2009			Brand attention and evaluation at the point of purchase (**evaluation can result in consideration, recall or choice**)	(Using an eye-tracking experiment) **the number of facings has a strong impact on evaluation that is entirely mediated by its effect on visual attention** and works particularly well for frequent users of the brand, for low-market-share brands, and for young and highly educated consumers who are willing to trade off brand and price. **Gaining in-store attention is not always sufficient to drive sales**. For example, top- and middle-shelf positions gain more attention than low-shelf positions; however, only topshelf positions carry through to brand evaluation.	Wrong outcomes
Dennis et al 2013		Harrods Shop, UK	Effect of digital signage advertisements on shopper experience	Practical implications arise as **'affective' Digital Signage ads can increase shoppers' approach towards an advertiser and the store that carries the ads,**	Wrong outcomes

				especially in generating loyalty from first time shoppers	
Mussol et al 2019		Focus: ice-cream	Effect of in-store sale promotions (nonmonetary vs. monetary) on **in-store relationships with consumers**	The results show that non-monetary promotions generate more relational benefits than price-based promotions. They appear to be a significant lever in developing relationships with consumers within the supermarket retail channel, where brands have no formal control over their distribution. Such sales promotions convey brand willingness to develop relationships during in-store encounters.	Wrong outcome
Wood 2005	Discussion paper **Useful for understanding / definition of impulse buying**			This paper addresses a disjunction between consumer behaviour discourse about 'impulse buying' and the reality of shopper behaviour in contemporary marketing and retail environments, by revising the concept of unplanned buying. The consumer behaviour literature features **'impulse buying' as extraordinary, emotion-saturated buying that takes place largely without regard to financial or other consequences.**	Wrong outcomes; Lack of outcomes – it was a discussion paper

				'**Point-of-purchase' decision making** or **'Discretionary unplanned buying' decisions** are considered to be **universal, expected and encouraged.** **'Discretionary unplanned buying'** is when **consumers buy goods and services with discretionary income intentionally, but without prior planning**. It is suggested that such purchases account for a significant portion of the excitement and the 'hedonic' satisfaction that consumers receive from their consumption purchases, both in the present day and historically.	
Bava et al 2009	**multi-method qualitative approach** included 2 semi-structured interviews per person (held as the first and last phases of data collection), an accompanied shop, and a short questionnaire	n=9 (females) New Zealand Focus: groceries (food retail)	How consumers perceive and respond to cues within the retail environment	Participants were aware that a variety of in-store cues exerted a degree of influence on their purchasing decisions and they were found to use this together with their individual contexts (including preferences, knowledge and previous experiences) to evaluate displays and promotions, and reach decisions. **The relative importance of in-store cues and individual contexts was found to vary between purchasing decisions as well as from person to person.**	Wrong outcome

Bigne et al 2016	Qualitative comparative analysis	n=41 Spain Focus: beer	consumer responses to an integrated stimulus from the brand and shelf space (i.e., manufacturer and retailer policies)	When buyers or customers spend less time on the first choice, they tend to purchase more brands. Retailers should consider this influence when pursuing additional sales by considering product location and time of buying jointly.	Wrong outcomes; Outcome not specific enough
Flamand et al 2016					Wrong outcomes; The paper proposes a 0–1 integer programme that takes into account a range of retailer requirements and variables. Effects of individual in-store interventions is not evaluated.
Nordfalt 2009					Intervention other than in-store advertising; Study did not look at in-store advertising but at the type of shopping trip affecting unplanned purchases.
Wang et al 2006			Objective of this research is to optimize the link structure of webpages for an e-supermarket.		Wrong outcomes (website / page accessibility)
Lacey et al 2007 [38]	Cross-sectional survey	n=2461 Setting not clear, most likely USA	customer's **intentions to increase the magnitude of their current purchasing activities** from a specific firm during the next 12-month period	While controlling for individual customer characteristics**, higher levels of preferential treatment are shown to positively influence** relationship commitment, **increased purchases**, share of	Intervention other than in-store advertising

		national upscale department store chain Focus: ?		customer, word of mouth, and customer feedback.	
Benedicktus et al 2010	RCTs <u>1: 4x2x2</u> (Consensus x physical presence x brand) between-subjects design <u>2: 2x2x3</u> (Suspicion x brand x consensus) between-subjects design	1: n=118 respondents 2: n=261 respondents The USA Focus: 1: books 2: groceries	Two related studies investigated means by which etailers can convey trustworthiness to consumers and thereby increase **purchase intentions** relative to hybrid firms.	Results suggest that **consensus information** (the extent of satisfaction agreement among previous customers) **provides a broad cue that conveys trustworthiness and leads to greater purchase intentions** for both familiar and unfamiliar brands, as well as hybrid and etailer firms.	Intervention other than in-store advertising
Borle et al 2007	RCT	Control gr.: n=1227 Test gr.: n=3773 The USA Focus: Automotive services	Impact of participating in a firm-sponsored satisfaction survey on (1) services purchases, (2) responsiveness to promotions, (3) inter-purchase time, (4) **spending**	Positive relationship between satisfaction survey participation and all the customer behaviours studied. People who completed the survey spent significantly more than those who did not. Effects of the survey were moderated by customer characteristics and store-specific variables, and varied over time.	Intervention other than in-store advertising
Esmark et al 2018	2x2 between subject design 2 (personal space encroachment:	n=76 The USA	Purchase intentions	The physical proximity of an employee to a shopper can **increase consumers' acceptance feelings and their purchase**	Intervention other than in-store advertising

	low vs. high) X 2 (product: non-expressive vs. expressive)	Focus: cosmetics (nail polish & make up remover)		**intentions** (due to an increased feeling of acceptance).	
Grewal et al 2018	1: RCT 2: RCT	1: n=294 2: n=117 All participants were customers of 4 large-scale retail shops in Stockholm, Sweden Focus: any items in the retail shops	Purchases	Using eye-tracking technology in both a field study and a field experiment, matched with sales receipts and survey responses, the authors show that **mobile phone use (vs. non-use) and actual mobile phone use patterns both lead to increased purchases**, because consumers divert from their conventional shopping loop, spend more time in the store, and spend more time examining products and prices on shelves.	Intervention other than in-store advertising
Yoon 2013 [39]	Cross sectional Survey on undergraduate students in the University of Seoul	n=302 Seoul Focus: perfume and detergent	Impulse buying	**Affective shopping experience** (i.e. …) **boosted impulse buying and rational experience** (i.e. …) **decreased it significantly at department store.** However, no consistent pattern of influence was detected for the effects of atmospherics on impulse buying when examined by store type.	Intervention other than in-store advertising