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Short Communication



Nudging healthier food choices among low socioeconomic position consumers: a field study in an Italian social supermarket

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ABSTRACT

Promoting healthier food choices among low socioeconomic position (low-SEP) consumers is a public health priority, but real-world evidence on the effectiveness of nudging interventions in this population remains limited. Social supermarkets, where surplus food is allocated to low-SEP households without monetary exchange, offer a rare opportunity to examine how interventions affect food selection independent of price. This study examined whether nudging interventions could increase whole-grain pasta selection at an Italian social supermarket in Parma over 61 operating weeks, a setting and duration rarely examined in the nudging literature. The study used a sequential design comprising five periods: control phase, behavioral intervention (increased product availability), combined intervention (availability plus an evaluative label and an infographic), return to the behavioral intervention only, and follow-up. The weekly proportion of whole-grain pasta sales was calculated from aggregate point-of-sale (POS) data and analyzed using one-way ANOVA with Games-Howell post-hoc comparisons. Whole-grain pasta selection increased overall, from 1.67% during the control period to 16.63% during the follow-up ($F(4, 56) = 11.95$, $p < 0.001$, $\eta^2 = 0.460$). The combined intervention, the second behavioral phase, and the follow-up all differed significantly from the control. The elevated selection observed during the interventions persisted throughout the follow-up. In this single-site field study, combining availability-based nudges with simple cognitive elements was associated with a meaningful and sustained increase in whole-grain pasta selection among low-SEP consumers. Although the sequential design cannot fully separate the interventions from contextual and seasonal influences, these findings support further evaluation of nudging strategies in food assistance programs.

1. Introduction

Food insecurity and poor diet quality remain pressing global challenges, addressed in Sustainable Development Goal 2 “Zero Hunger”, which aims to end hunger, achieve food security and improved nutrition, and promote sustainable agriculture by 2030 (United Nations General Assembly, 2015). Achieving this goal requires diets that are not only sufficient, but also healthy and affordable for all population groups, as reflected in the Food and Agriculture Organization definition of sustainable healthy diets (FAO and WHO, 2019). As a result, households with low socioeconomic position (low-SEP), which face barriers to both dimensions, are at heightened risk of food insecurity (Penne & Goedemé, 2021).

In Italy, food insecurity and dietary inequalities are a persistent concern. In 2024, over 2.2 million households (8.4% of resident households) and 5.7 million individuals (9.8% of the population) were in absolute poverty, (ISTAT, 2025b). Economic pressure on food choices is also widespread, with 31.1% of Italian households reporting that they limited the quantity or quality of food purchased despite a 2.5% rise in food prices (ISTAT, 2025a). A substantial share of the Italian population therefore faces persistent economic constraints that affect both food access and dietary quality.

Public bodies and third-sector organizations in Italy work jointly to address food insecurity. Non-profit organizations supplement state efforts by supporting low-SEP populations through food redistribution, solidarity supermarkets, soup kitchens, and church-led programs (Baglioni et al., 2017). Among these, social supermarkets (often referred to as “solidarity emporiums”) represent a model where surplus food from manufacturers and retailers is redistributed via point-based systems to economically disadvantaged households. This setting is

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particularly relevant for studying food choices among low-SEP populations, as affordability remains one of the most documented barriers to healthy eating in Italy and other high-income countries (Benedetti et al., 2025). By removing monetary exchange, social supermarkets neutralize this barrier, creating a unique opportunity to examine how non-price factors (such as product placement, availability, and informational cues) influence dietary decisions.

However, economic affordability is only one of several factors shaping food choices among low-SEP households; cultural, social, and contextual factors also play a key role (Benedetti et al., 2025; Nicholls & Drewnowski, 2021). This points to the need for interventions that target not only income and price constraints but also the choice environment itself. Nudging is a low-intrusive intervention that modifies the choice architecture without restricting options or relying on economic incentives (Thaler & Sunstein, 2008). Evidence from a systematic review of salience- and priming-based nudges indicates that subtle environmental cues can shift food and beverage choices toward healthier options (A. L. Wilson et al., 2016). A meta-analysis of field experiments has shown that nudging can effectively promote healthier food choices, with behavioral nudges (such as changes in product placement or availability) producing larger effect sizes than cognitive nudges such as informational labels (Cadario & Chandon, 2019).

The effects of nudging on low-SEP individuals are less consistent than on the general population. Systematic reviews indicate that different types of nudges work differently for these groups. Cognitive nudges, such as nutritional labels, tend to be more effective for higher-SEP groups while behavioral nudges, such as changes in product availability, appear more effective for low-SEP groups (Sapio & Vecchio, 2024). In real-life food purchasing environments, most nudging studies have focused on informational and position-based interventions, with availability-based nudges remaining under-studied. In addition, few studies have assessed long-term effects, with the majority of interventions lasting less than six months (Harbers et al., 2020). Evidence from settings such as social supermarkets, where low-SEP households make routine purchasing decisions, is particularly scarce.

Whole grains are a public health priority worldwide, offering well-documented health benefits over refined grains, yet their intake remains below recommended levels in most populations (Nirmala Prasadi & Joye, 2020). In Italy, the recently updated Mediterranean diet pyramid by the Italian Society of Human Nutrition (SINU) places whole-grain cereals at its foundation as the main source of carbohydrates, in preference to refined cereals (Sofi et al., 2025). Whole-grain pasta could be a culturally compatible and practical option, given that pasta is a staple food in Italy and a key component of the Mediterranean diet. While its higher retail price can act as a barrier for low-SEP households in conventional retail settings, this constraint is removed in the social supermarket context, where products are allocated through a point-based system. Nevertheless, the removal of the price barrier alone may not be sufficient to shift choices toward whole-grain options, suggesting a role for choice-architecture interventions.

Against this background, evidence is still needed from real-world settings where low-SEP consumers make routine food choices and where price is not the operative barrier. Social supermarkets meet these conditions, yet they remain largely absent from the nudging evidence base, which is dominated by conventional retail and, to a lesser extent, US food-pantry studies. This study addresses this gap by assessing the effects of behavioral and combined behavioral–cognitive nudges on whole-grain pasta selection among customers of a social supermarket in Parma, Italy, over an extended period. The findings could inform future interventions and dietary support strategies for low-SEP groups.

2. Methods

2.1. Study setting

The study was conducted at a social supermarket in Parma, Italy, "Emporio Market Solidale" (Solidarity Emporium Market), in collaboration between the research team and the Emporio's director. The Emporio redistributes donated surplus food from manufacturers and retailers to economically disadvantaged households and individuals. Customers receive points proportional to their household composition and specific needs, which they can use to select products without monetary exchange. Eligibility is restricted to residents of the Province of Parma with an Equivalent Economic Situation Indicator (ISEE) below €7500 per year. Each customer receives a personal, non-transferable card valid for one year. In 2024, the Emporio redistributed food surpluses amounting to approximately €4,996,000 to more than 1800 families, corresponding to approximately 7000 individuals, with approximately 700 customer visits per week (Emporio Solidale Parma, 2026). Additionally, it serves as a hub within a broader solidarity network of approximately 40 local associations and projects, distributing over €1,190,000 in surplus food to partner organizations in the same year. Ethics approval of this study was granted by the Ethics Committee of the University of Parma (protocol number: 0253483/2024).

2.2. Design and nudging interventions

To study the food choices of low-SEP consumers, we considered several food-assistance models, including social canteens, food banks, and mobile food distribution. We selected the social supermarket because it allows customers to make repeated, self-directed product selections within a stable, retail-like environment, more closely resembling everyday shopping than one-off food assistance. To design the study and choose appropriate nudging strategies, we conducted several site visits to understand store operations and customer flow and held discussions and semi-structured interviews with the Emporio's director, volunteers, and customers to identify feasible interventions. Whole-grain pasta was selected as the target product, given the public health relevance of whole-grain consumption and its cultural fit with Italian dietary habits. Pasta is also one of the most frequently selected items at the Emporio. Both generic and whole-grain pasta (spaghetti type) were assigned the same point value (1 point per package), ensuring that the point cost was not a factor in product selection. The study was designed as a nudging intervention with sequential phases comprising a pre-intervention control period, treatment phases testing two nudging strategies, and a post-intervention follow-up period. Two types of nudging interventions were implemented.

(i) a behavioral nudge: increased target product availability on the shelf. Prior to the study, whole-grain pasta was rarely available at the Emporio, as it was infrequently included among donated products and had no designated shelf position. Throughout the intervention periods, the research team regularly supplied whole-grain pasta packages to ensure continuous availability and prevent stock shortage. A designated shelf space at eye level was allocated for the whole-grain pasta, while the space and position of generic pasta remained unchanged;

(ii) a combined nudge, which added cognitive elements (an infographic and an evaluative label) to the behavioral intervention. An evaluative label (Fig. 1a.), selected by customers during the preparatory interview phase, was placed on the shelf below the whole-grain pasta. An infographic (Fig. 1b.) highlighted the potential health benefits of whole-grain consumption, the recommended daily servings, and the role of whole grains as a source of macro- and micronutrients. Both materials were displayed next to the whole-grain pasta section (Fig. 2.). All materials were provided in Italian, English, French, and Arabic, the most common languages used by customers.

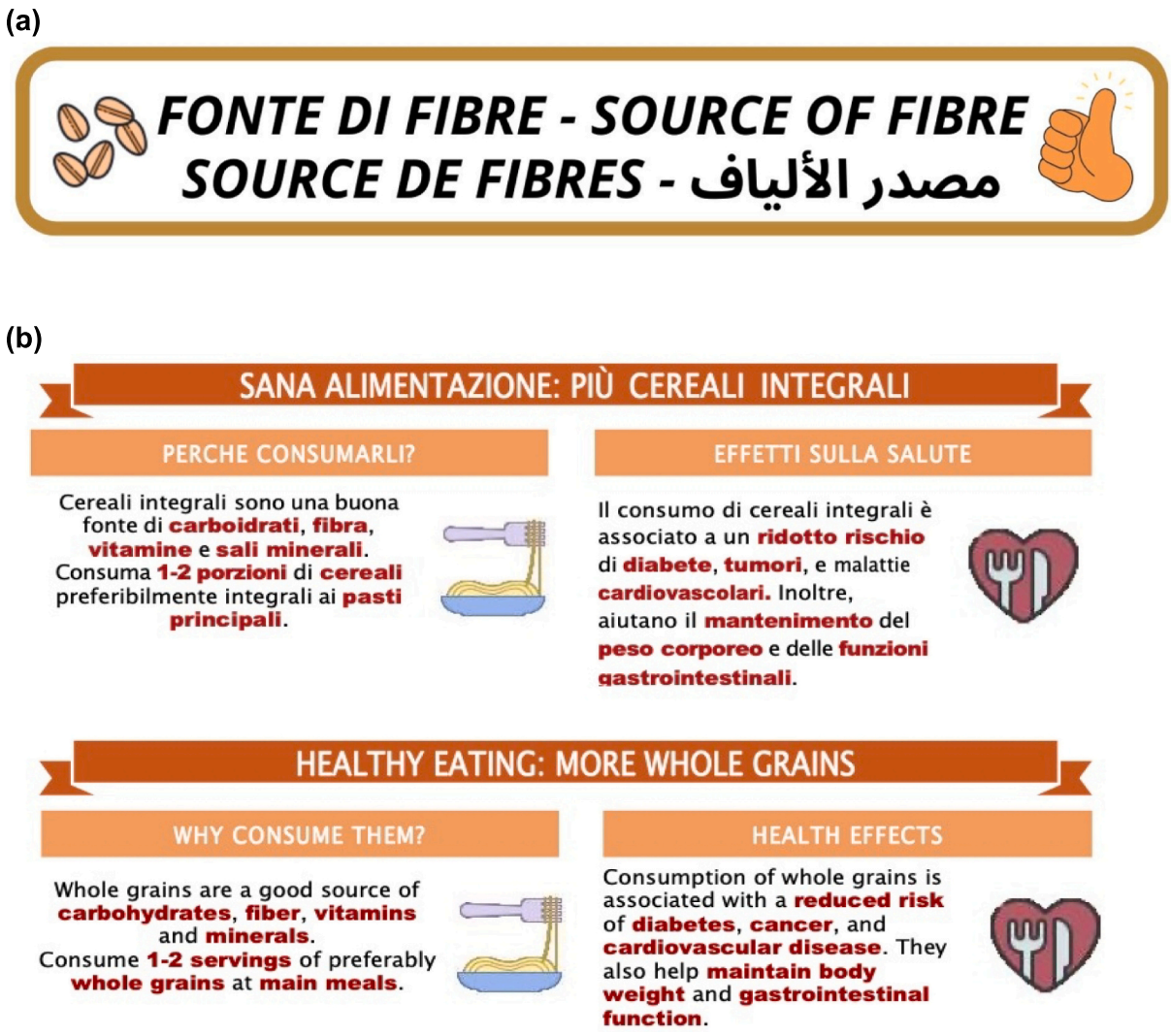

Fig. 1. Evaluative label (a) and infographic (b) used for the combined nudging intervention (Italian and English versions shown). Materials were displayed in Italian, English, French, and Arabic.



Fig. 2. Combined nudging intervention on the shelf, showing whole-grain pasta packages (left), infographics in four languages (right), and evaluative label (bottom left).

2.3. Data collection

The study was conducted from June 3, 2024 to August 29, 2025 (61 operating weeks). The Emporio operates on weekdays only, with opening hours that vary across days. The study period was divided into five distinct phases: a control period, three sequential intervention phases (behavioral, combined, and a return to behavioral), and a follow-up period (Table 1). Note that during the Follow-up period, whole-grain pasta remained available at the designated shelf position through continued donations from donors rather than active supply by the

Table 1
Study periods, intervention descriptions, and duration.

Period	Description	Dates	Duration (weeks)
1. Control	Normal sales patterns, no intervention	June 3–Sep 20, 2024	14
2. Treatment 1: Behavioral nudging – First phase (Tr.1 Pre)	Increased availability only	Sep 24–Oct 25, 2024	5
3. Treatment 2: Combined nudging (Tr.2)	Increased availability + infographic + evaluative label	Oct 28–Nov 29, 2024	5
4. Treatment 1: Behavioral nudging – Second phase (Tr.1 Post)	Increased availability only (cognitive elements withdrawn)	Dec 2, 2024–Jan 10, 2025	6
5. Follow-up	No intervention	Jan 13–Aug 29, 2025	31

research team, while the cognitive elements (the evaluative label and the infographic) were no longer in place.

The data collected were point-of-sale (POS) data. At the Emporio, transactions are recorded at the checkout register when customers redeem points for products; these records are referred to here as POS data. Transaction records for all pasta products were extracted from the database throughout the study period and classified as generic pasta (durum wheat semolina) or whole-grain pasta (whole durum wheat semolina) based on their product codes. For each transaction, the number of packages sold and the corresponding product weight (in grams) were recorded.

Daily totals were calculated by summing the weight of all pasta packages sold per day, separately for generic pasta and whole-grain pasta. They were then averaged across the operating days of each week, reducing day-to-day variability arising from uneven operating hours and producing more stable weekly estimates. The outcome measure was the weekly percentage of whole-grain pasta, calculated as:

$$\%\text{whole}-\text{grain pasta (week)} = [\text{average daily whole}-\text{grain weight (g)} / \text{average daily total pasta weight (g)}] \times 100$$

where the total pasta weight is the sum of generic and whole-grain pasta weights for each day.

To monitor the implementation of the interventions, researchers conducted structured observations to verify product availability and stock levels, shelf arrangement and nudging material placement, and any disruptions to normal store operations. Observations were conducted daily during the intervention periods (Tr.1 Pre, Tr.2, and Tr.1 Post) and weekly during the Follow-up period. No structured observations were conducted during the Control period, when baseline POS data were collected under normal operating conditions.

2.4. Data analysis

Each operating week contributed one observation of the weekly percentage of whole-grain pasta sales, yielding 61 weekly observations across the five study periods. To examine the effectiveness of the nudging interventions, we conducted a one-way analysis of variance (ANOVA) with study period as the independent variable (Control, Tr.1 Pre, Tr.2, Tr.1 Post, and Follow-up) and the average weekly percentage of whole-grain pasta sales as the dependent variable. Prior to conducting the ANOVA, we tested the homogeneity of variances using Levene's test. Because Levene's test indicated a violation of the homogeneity assumption, we applied the Games-Howell post-hoc procedure, which does not assume equal variances and is robust to unequal group sizes. Effect size was estimated using eta-squared (η^2). Statistical significance was set at $p < 0.05$. All statistical analyses were performed using IBM SPSS Statistics version 29.0.

3. Results

Table 2 presents the descriptive statistics for whole-grain pasta sales across all study periods. During the control period, whole-grain pasta accounted for a mean of 1.67% ($SD = 1.94$) of total pasta sales. The proportion of whole-grain pasta in total pasta sales increased across subsequent periods. This elevated level continued into the 31-week follow-up, where sales peaked at 16.63% — representing an approximately 15 percentage-point increase from baseline (Fig. 3.). Notably, the standard deviation increased substantially in later phases (Tr.1 Post and Follow-up), reflecting greater week-to-week variability in whole-grain pasta selection, likely influenced by the Christmas and summer holiday periods captured within these phases.

A one-way ANOVA revealed a statistically significant effect of study period on whole-grain pasta sales ($F(4, 56) = 11.95$, $p < 0.001$, $\eta^2 = 0.460$); this effect accounted for approximately 46% of the variance in weekly sales proportions. Games-Howell post-hoc comparisons (Table 3) showed that the combined intervention (Tr.2; $p = 0.048$), the second behavioral phase (Tr.1 Post; $p = 0.028$), and the Follow-up ($p < 0.001$) periods all differed significantly from the control. The Follow-up period also differed significantly from the initial behavioral phase (Tr.1 Pre; $p = 0.002$). No significant differences were observed among Tr.2, Tr.1 Post, and the Follow-up periods. In summary, the post-hoc comparisons indicate that the elevated whole-grain pasta selection observed during the intervention periods (starting from Tr.2) persisted into the 31-week follow-up.

4. Discussion

This study examined the effects of nudging interventions on whole-grain pasta selection among low-SEP consumers at a social supermarket in Parma, Italy. The percentage of whole-grain pasta sales increased overall across the study periods, reaching approximately 15 percentage points above control by the end of the Follow-up. Post-hoc Games-Howell comparisons indicate that behavioral nudging alone (Tr.1 Pre) did not differ significantly from the control, whereas the combined intervention (Tr.2), the second behavioral phase (Tr.1 Post), and the Follow-up all differed significantly from control. This suggests that increasing the availability of whole-grain pasta on its own was not sufficient to shift selection in this setting. Higher levels of selection were observed from the combined intervention (Tr.2) onward and persisted through the second behavioral phase (Tr.1 Post) and the Follow-up, suggesting that once the initial shift had occurred, the behavioral component alone was sufficient to sustain it without the continued presence of the cognitive elements. Although the intervention formally ended after the second behavioral phase (Tr.1 Post), whole-grain pasta remained available during the Follow-up through continued donation flows, so this period did not represent a full return to baseline conditions. Availability, however, was no longer actively managed by the research team, and the greater week-to-week variability in this period

Table 2
Descriptive statistics for whole-grain pasta sales by period.

Period	n (weeks)	Mean % (SD)	95% CI	% Change from Control
1. Control	14	1.67 (1.94)	[0.55, 2.79]	–
2. Tr.1 Pre (Behavioral)	5	6.96 (3.11)	[3.09, 10.82]	+5.29
3. Tr.2 (Combined)	5	10.87 (4.71)	[5.03, 16.72]	+9.21
4. Tr.1 Post (Behavioral)	6	15.10 (7.16)	[7.58, 22.61]	+13.43
5. Follow-up	31	16.63 (8.79)	[13.41, 19.85]	+14.96

Notes: SD = Standard deviation. CI = Confidence interval.

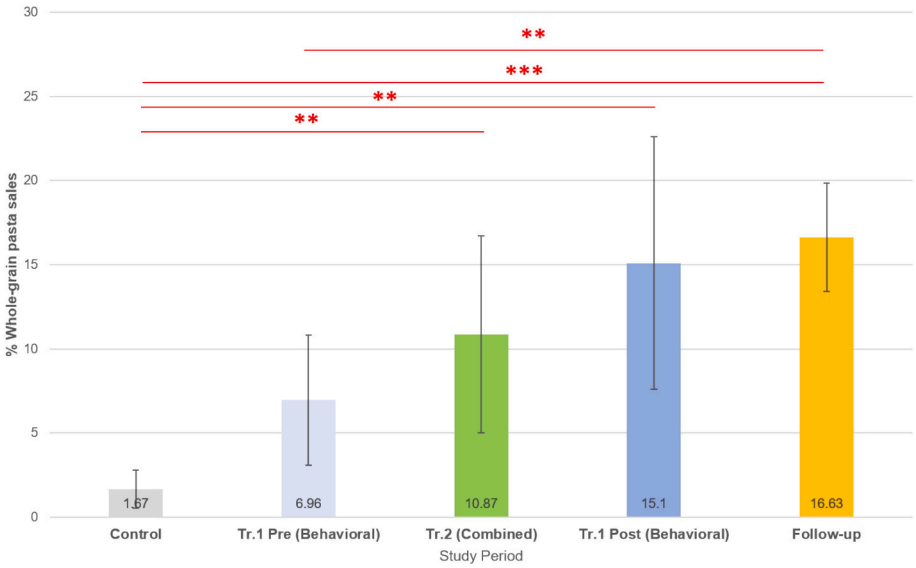

Fig. 3. Mean weekly whole-grain pasta sales (%) across the five study periods. Error bars represent 95% confidence intervals. Significance brackets indicate Games-Howell post-hoc comparisons (**$p < 0.05$, ***$p < 0.001$). $N = 61$ weeks.

Table 3
Games-Howell post-hoc comparisons of whole-grain pasta sales between periods.

Comparison	Mean Difference	*p*-value	95% CI
Control vs. Tr.1 Pre	−5.29*	0.074	[−11.18, 0.59]
Control vs. Tr.2	−9.21**	0.048	[−18.32, −0.10]
Control vs. Tr.1 Post	−13.43**	0.028	[−25.05, −1.81]
Control vs. Follow-up	−14.96***	<0.001	[−19.74, −10.19]
Tr.1 Pre vs. Tr.2	−3.92	0.566	[−12.97, 5.14]
Tr.1 Pre vs. Tr.1 Post	−8.14	0.190	[−19.69, 3.41]
Tr.1 Pre vs. Follow-up	−9.67**	0.002	[−16.07, −3.28]
Tr.2 vs. Tr.1 Post	−4.22	0.766	[−16.45, 8.00]
Tr.2 vs. Follow-up	−5.76	0.263	[−14.53, 3.02]
Tr.1 Post vs. Follow-up	−1.53	0.989	[−12.93, 9.87]

Notes: CI = Confidence interval. *$p < 0.10$, **$p < 0.05$, *** $p < 0.001$.

likely reflects this less consistent supply. The non-significant differences among Tr.2, Tr.1 Post, and the Follow-up are consistent with this interpretation, although they should not be read as evidence of equivalence given the high variability in the later periods. Although increasing availability alone (Tr.1 Pre) did not significantly increase the percentage of whole-grain pasta compared to the control, the level observed during this phase (6.96%) was already comparable to the national retail share of whole-grain pasta in Italy (around 4.5% by volume; Food Insights, 2026).

Because the design was sequential and each intervention period was relatively short (5–6 weeks), other explanations for this pattern cannot be ruled out. The cognitive elements may have had a priming or learning effect that raised the response to the behavioral nudge alone once the material was removed. Alternatively, time-related factors, such as growing customer familiarity with whole-grain products or seasonal variation, may also have contributed. Whether the observed pattern reflects a cumulative intervention effect, broader systemic changes, or these other contextual factors cannot be determined from these data. Long-term studies in real purchasing environments are inevitably exposed to seasonal and contextual variation. The inclusion of the Christmas/New Year and summer holiday weeks within Tr.1 Post and the Follow-up periods could result in higher weekly sales variability than in earlier periods, as customer attendance, donation flows, and purchasing patterns at the Emporio typically differ from regular periods.

These findings are broadly consistent with field evidence that behaviorally oriented nudges can shift food choice in real purchasing environments (Cadario & Chandon, 2019; Sapio & Vecchio, 2024). Availability-based interventions have reported mixed but generally favorable effects on food selection. In Kenyan markets, increased availability of a nutritious product led to higher purchases of that product and reduced purchases of less-nutritious competing brands, although overall category consumption did not increase (Maredia et al., 2024). In the UK, increased availability of lower-energy meal options reduced meal energy intake with no significant post-meal compensation, and effects were similar across socioeconomic groups (Langfield et al., 2023). A systematic review of nudging field studies identified only four with comparisons favoring more disadvantaged populations: two behaviorally oriented nudges (both in US SNAP-eligible groups) and two cognitively oriented nudges (Schüz et al., 2021).

The magnitude of the effects observed in this study differs from recent evidence from real-world supermarket nudging interventions targeting low-SEP populations, which have produced inconsistent results: positive but modest effects on vegetable purchases through social norm cues in shopping trolleys (Huitink, Poelman, van den Eynde, et al., 2020), statistically significant but practically limited effects on snack purchases (van den Bekerom et al., 2025), null effects on substitution of unhealthy with healthier snacks at supermarket checkouts (Huitink, Poelman, Seidell, et al., 2020) and in a pooled analysis of four controlled trials (Stuber et al., 2024). Several explanations have been proposed, including the mismatch between repositioning nudges and the broader healthy-eating needs of low-SEP populations (van den Bekerom et al., 2025) and the limited noticeability of interventions in busy retail environments (Huitink, Poelman, Seidell, et al., 2020). The Emporio setting, which removes price from product selection, may in part create more favorable conditions for behavioral nudges than conventional retail environments.

Real-world implementation studies in social supermarkets or food pantries are particularly scarce, and most published work comes from the US (Anderson et al., 2021; Orr & Ernst, 2026; Wilson et al., 2017). Our results contribute a positive finding to this mixed evidence base, showing that combining an availability-based nudge with simple cognitive elements was associated with greater whole-grain pasta selection in an Italian social supermarket. The extended follow-up period (over six months) further contributes to the nudging study field, where long-term evidence remains rare (Harbers et al., 2020; Hunter et al., 2026).

The effect size observed in this study is large by conventional

thresholds. However, direct comparison with effect sizes reported in nudging meta-analyses (which typically rely on individual-level data and report small-to-moderate effects) should be made with caution, as effects estimated from aggregate weekly sales data may differ in magnitude from those estimated at the individual level. Aggregate weekly proportions reflect store-level selection shares rather than the probability that a given customer changes their choice, so they do not correspond directly to the individual-level effect sizes pooled in meta-analyses. Several contextual and systemic factors may help explain this pattern. Field observations during the study periods, based on repeated site visits and discussion with the Emporio's director and vice-director, suggested that the intervention may have influenced not only customer choices but also the wider store environment. We observed volunteers spontaneously placing whole-grain products more prominently near the whole-grain pasta section, and feedback from the director indicated increased awareness of healthy food placement. Over time, the mix of donated products also appeared to include more whole-grain pasta, possibly reflecting greater attention to these products within the store. This suggests that nudging in social supermarkets may extend beyond customer behavior to influence the broader choice environment.

This study makes several contributions to the nudging literature. First, to our knowledge it is the first nudging field intervention conducted in an Italian social supermarket over an extended observation period of more than a year. Unlike the conventional supermarkets and food pantries that dominate the existing literature, it serves a low-SEP population while resembling everyday shopping more than one-off food assistance. Second, because the Emporio allocates products through a point-based system rather than monetary exchange, and both generic and whole-grain pasta carried the same point value, the study allows food selection to be examined in a context where monetary price does not constrain choice, a condition rarely achievable in real purchasing environments. Third, the 31-week follow-up extends well beyond the duration of most nudging field studies, where long-term evidence remains scarce (Harbers et al., 2020; Hunter et al., 2026), and shows that the higher selection persisted over an extended period. Finally, the use of aggregate weekly POS data captures actual selection behavior in a real purchasing setting, reflecting revealed preferences rather than stated intentions. Together, these features make the study a feasible, low-cost model that subsequent work can replicate in other social supermarkets or extend to additional product categories. Beyond these contributions, findings from these types of interventions have the potential to inform how food assistance programs can be designed to support not only food security but also dietary quality among low-SEP populations. Choice-architecture interventions based on low-cost informational and shelf-organization changes may offer a particularly relevant tool in social supermarkets and similar food assistance settings.

Several limitations should also be acknowledged. First, the study was conducted in a single site with a single product category, which limits generalizability to other social supermarkets, cities, or food categories. Second, the design was sequential and pragmatic, without a parallel control group or randomization of participants, a limitation shared by single-site field nudging studies (Van Gestel et al., 2018). This means we cannot fully separate intervention effects from underlying time trends, and external factors such as seasonality, donor patterns, and staff changes could not be fully controlled despite weekly monitoring. Third, the aggregate weekly data analyzed here do not distinguish whether the effect was driven by a small group of highly responsive customers or a broader shift across the customer base, a constraint shared by other field studies relying on aggregate sales data (Yi et al., 2022). Fourth, the short duration of each intervention phase (5–6 weeks) may have limited statistical power for some pairwise comparisons between intervention phases. Finally, the Tr.1 Post and Follow-up periods overlap with the Christmas/New Year and summer holiday periods, respectively. As noted above, holiday-related factors may have affected both the variability and the mean levels in these phases. While the 31-week follow-up extends well beyond any single holiday, a holiday contribution to the elevated selection cannot be fully ruled out.

Several directions for future research follow from these findings. As part of this project, 200 questionnaires were collected from Emporio customers, and individual-level POS data were collected through the Emporio's personal-card system. Integrating these questionnaire responses with the individual-level POS data in subsequent analyses could help characterize who responded to the interventions and why, and clarify whether the observed effect reflects broad behavior change or concentrated responses among a subset of customers. Future studies should also be designed to better separate intervention effects from seasonal and contextual variation, for example through multi-year designs or extended pre-intervention baselines that capture the same seasonal windows as the intervention. In addition, future studies could extend the duration of each treatment phase, which would provide more stable estimation of period-specific effects and allow the use of statistical methods designed for sequential time-period data, such as time-series regression or segmented regression. Adaptation of our design across multiple social supermarkets, cities, socioeconomic contexts and countries would test whether these nudging interventions work in other settings. Extension to other nutritionally relevant categories, such as whole-grain rice, bread, legumes, and fruits and vegetables, could test the transferability of the approach beyond pasta. Finally, qualitative research with customers, volunteers, the director, and donors would help explore the mechanisms through which nudging interventions in social supermarkets may produce systemic change.

5. Conclusion

This study examined the effect of nudging interventions on whole-grain pasta selection over 61 operating weeks at a social supermarket in Parma, Italy, a setting where low-SEP consumers make actual purchasing decisions. The results suggest that combining an availability-based nudge with simple cognitive elements was associated with a meaningful increase in the selection of whole-grain pasta, and that this elevated selection persisted into the follow-up period, during which whole-grain pasta remained available through continued donations. Field observations suggest that the observed effects may be reinforced by systemic changes within the store environment, rather than by individual behavior change alone. Because the study used a sequential design without randomization or a parallel control site, these findings cannot fully separate the interventions from time trends and seasonal or contextual changes, and should be interpreted as preliminary field evidence.

These findings provide practical implications for both practitioners and policymakers. For social supermarkets and food banks, simple choice-architecture strategies, such as prioritizing the availability of healthier options and adding brief nutritional information at the point of selection, could be implemented with limited disruption. The informational and shelf-organization components require only one-time changes and no additional staffing, whereas the continued availability of whole-grain pasta depends on donation flows or procurement by the organization and represents the main recurring cost. For policymakers, these findings suggest that nudging approaches may warrant consideration as a low-cost, non-intrusive complement to social assistance programs aimed at addressing dietary inequalities among low-SEP populations. Together, these findings point to social supermarkets as a promising and underused setting for nudging interventions targeting dietary inequalities.

CRediT authorship contribution statement

Cristina Mora: Writing – review & editing, Supervision, Investigation, Funding acquisition, Conceptualization. **Rungsaran Wongprawmas:** Writing – review & editing, Writing – original draft, Validation, Software, Formal analysis, Data curation. **Davide Menozzi:** Writing – review & editing, Validation, Methodology, Investigation.

Audrey Cavalieri: Writing – review & editing, Investigation, Data curation.

Ethical statement

Ethics approval of this study was granted by the Ethics Committee of the University of Parma (protocol number: 0253483/2024).

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Data availability

Data will be made available on request.

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