



Emotional health cues and their influence on healthy food choice: an experimental study

Isyarat emosional tentang kesehatan dan pengaruhnya terhadap pilihan makanan sehat: sebuah studi eksperimen

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Abstract

The prevalence of obesity in Indonesia has shown a consistent upward trend, reaching 23.1%, largely driven by dietary patterns that pose health risks. Food choices are influenced not only by social and personal factors but also by environmental cues, which are the focus of this study. This research aimed to investigate the effect of affective health cues presented through human motion picture videos on individuals' healthy food choices. A quasi-experimental design was employed in the Psychology Laboratory at Universitas Negeri Semarang in December 2024, using a simulated supermarket setting with 186 student participants selected through purposive sampling. Data were analyzed using an Independent Samples t-test. The results indicated that the human motion picture intervention significantly influenced individual food choices ($p < 0.001$, $d = 0.98$). These findings suggest that health cues play an important role in guiding individual decisions regarding healthier food options. In conclusion, environmental factors, such as health cues, can significantly impact healthy food selection and may serve as a strategic approach to reducing obesity rates in the future.

Keywords: Eating behavior, health cues, obesity, healthy food, behavioral intervention

Abstrak

Peningkatan obesitas di Indonesia mengalami tren kenaikan yang konsisten sebesar 23.1%, hal ini didorong oleh pola konsumsi makanan yang berisiko terhadap kesehatan. Tidak hanya dipengaruhi faktor sosial dan personal, pemilihan makanan juga dipengaruhi oleh faktor lingkungan yang menjadi fokus kajian penelitian ini. Penelitian ini bertujuan untuk menginvestigasi pengaruh *health cues* berbentuk video *human motion picture* berbasis afektif terhadap pilihan makanan sehat pada individu. Desain penelitian yang digunakan adalah quasi eksperimen yang dilakukan di Laboratorium Psikologi Universitas Negeri Semarang pada bulan Desember 2024, menggunakan supermarket simulasi dengan responden yang berjumlah 186 partisipan Mahasiswa yang dipilih dengan teknik purposive sampling. Analisis data menggunakan *Independent Samples t-test*. Hasil penelitian ini menggambarkan human motion picture memiliki pengaruh yang signifikan terhadap pemilihan makanan individu dengan $p < 0.001$, $d = 0.98$. Hal ini dapat menjelaskan bahwa health cues berperan penting dalam mempengaruhi keputusan individu dalam memilih makanan sehat. Kesimpulan, faktor lingkungan seperti health cues secara signifikan memberikan pengaruh dalam pemilihan makanan sehat dan dapat menjadi salah satu strategi untuk mengurangi tingkat obesitas di masa depan.

Kata Kunci: Perilaku makan, health cues, obesitas, makanan sehat, intervensi perilaku

Introduction

Unhealthy dietary patterns are major contributing factors to premature death, disability, and obesity (Haines, 2016). The prevalence of obesity in Indonesia has reached approximately 23.1% and has shown a consistent upward trend over the past decade (Badan Kebijakan Pembangunan Kesehatan, 2023). According to the 2018 Basic Health Research report (Health Research and Development Agency, Ministry of Health of Indonesia, 2018), approximately one in three adults in Indonesia are either overweight or obese. The World Health Organization (2024) identified overweight and obesity as the fifth leading risk factors for mortality worldwide, posing a serious threat to public health (Health Research and Development Agency, Ministry of Health of Indonesia, 2018). This elevated risk is often linked to dietary habits characterized by the consumption of high-calorie, high-fat, and cholesterol-rich food (Siswanto et al., 2025).

Food choices, particularly the preference for energy-dense foods, are strongly influenced by environmental factors. Social and economic conditions significantly shape eating behavior (Heuch et al., 2024; Rathi et al., 2025). The surrounding physical environment, including the availability of healthy foods at home and in the community, plays a substantial role in determining food access and choice. Atanasova et al. (2022) reported that the availability of nutritious foods at home is associated with healthier dietary patterns. Using the Nutrition Environment Measures Survey (NEMS), Almeida et al. (2023) identified four key domains that influence food choices: stores, restaurants, homes and communities. Similarly, Farrell et al. (2024) and Barnes et al. (2016) found that individuals living in areas with limited access to healthy food were more likely to consume fast food than those with greater access.

Beyond physical access, the broader environmental context plays a critical role in shaping dietary behavior. One influential component of this environment is the presence of health cues, which are contextual signals, such as labels, images, or videos, designed to promote health-conscious food choices. These cues may operate through visual, verbal, or emotional channels and are commonly used to shape consumer attention and behaviors. Emotional appeals, in particular, refer to health cues that

evoke affective responses, such as empathy, inspiration, or concern, to motivate healthier choices. Empirical evidence indicates that these cues can influence food-related decision-making (Larsen et al., 2022; Undarwati & Why, 2024). Health cues are frequently employed in marketing as visual and emotional strategies to draw attention to specific food products (Li et al., 2024; Motoki et al., 2025; Sample et al., 2020). Previous studies have shown that these cues are often visually salient and persuasive (Hallez et al., 2020; Vermeir & Roose, 2020). Vermeir & Roose (2020) further demonstrated that health cues can shape psychological processes and behavioral outcomes, including consumers' food choices. However, Mulier et al. (2021) found no significant effect of health cues on food selection behavior, and Bailey et al. (2022) noted that environmental stimuli associated with positive affect may override the influence of health cues, leading individuals to continue choosing unhealthy food. Pechey (2018) also concluded that unhealthy cues often exert a stronger influence on dietary decisions than do health-oriented messages.

These inconsistent findings highlight the need for further research to identify the types of health cues that effectively promote healthy food choices. One promising intervention involves the use of motion pictures and dynamic visual stimuli that portray human interactions with food or food-related environments (Matsuzaki et al., 2020; Osera & Kurihara, 2025; Toet et al., 2019). Trudel Guy et al. (2019) and Mattar et al. (2019) found that motion pictures can effectively influence eating behavior. Similarly, several studies have reported that visual content enhances perceptions of and intentions toward healthy food choices. Motion pictures can foster positive emotional associations with healthy foods, such as feelings of pleasure and satisfaction (Pettigrew, 2016; Kay et al., 2025; Tonkin et al., 2019). Schmuck et al. (2018) further suggested that repeated exposure to this type of content can shift viewers' perceptions of dietary norms and influence their behavior over time.

Although several studies affirm the potential of health cues and motion pictures to shape dietary behavior (Vermeir, 2020; Vermeir & Roose, 2020), other studies indicate limited or no impact (Mulier et al., 2021). Moreover, empirical studies within the Indonesian context that specifically examine the influence of health cues, particularly affective-based approaches

such as motion pictures, on food choices are scarce. Motion pictures are particularly relevant in this context because they evoke affective responses that can shape automatic food choices and allow the inclusion of social and environmental cues aligned with Indonesia's collectivist culture. These characteristics may render them more effective than static or purely cognitive interventions alone.

Grounded in the theoretical framework of affective priming and situated within Indonesia's cultural context, where social and environmental norms strongly influence decision-making, this study aims to address the existing research gap by examining the influence of affective health cues delivered through motion pictures on food selection behavior.

Methods

Research Design

This study employed a quasi-experimental design with a post-test-only control group design. This method was selected because it reduces potential treatment-related bias and simplifies the research process by eliminating the need for baseline measurements before the intervention.

The study was conducted in the Psychology Laboratory of Semarang State University over one month, specifically in October 2024.

Sample and Respondents

A purposive sampling technique was used, with the inclusion criteria specifying that participants should not be currently following a diet program, should not be vegetarian, and should not have food allergies.

The sample size was determined using G*Power 3.1.9.4 software (Neuha et al., 2023). An independent t-test was selected with an effect size of $d = 0.5$, significance level (α) of 0.05, and statistical power of 0.95. Based on these parameters, the minimum required sample size was calculated as 176 participants.

The study included 186 participants aged 17–25 years. This exceeded the minimum required sample size, thereby strengthening the statistical power and credibility of the findings and reducing the risk of bias caused by incomplete or invalid data.

Research Instrument

This study utilized a Simulated Supermarket Environment, an experimental laboratory-based setting designed to replicate a realistic shopping experience (van Herpen et al., 2016).

Participants were instructed to assume the role of consumers, enabling the observation of their food selection behavior in a context resembling daily purchasing situations. To enhance ecological validity, the simulation included realistic shelf arrangements, familiar product placements, and ambient environmental cues to support authentic behavioral responses of the participants.

Products were categorized as either healthy (low-calorie) or unhealthy (high-calorie) based on the U.S. FDA Annual Report (2021): low-calorie, <100 kcal per serving; and high-calorie, ≥ 100 kcal per serving. Each category (carbohydrates, snacks, and beverages) included specific examples.

- a. Carbohydrates: Eatzy Mushroom Chicken Shirataki Porridge (30 kcal/50 g) as low-calorie; Super Bubur Rasa Ayam (190 kcal/45 g) as high-calorie.
- b. Snacks: Fitbar Fruity Delight (90 kcal/20 g) as low calorie; Qtela Tempe Seaweed (120 kcal/20 g) as high calorie.
- c. Beverages: Pocari Sweat Ion Water (35 kcal/250 ml) as low-calorie; Greenfield Chocolate UHT (190 kcal/250 ml) as high-calorie.

This categorization was intended to help participants identify healthy food choices and reflect their daily energy intake considerations (World Health Organization, 2024).

Health cue manipulation was implemented through a 45-second video depicting an individual consuming healthy foods, such as fruits and vegetables. The video used an affective communication approach that emphasized the emotional and psychological benefits of healthy eating (Toet & van Erp, 2020). Presented in a 3:1 portrait aspect ratio—commonly used in digital media to enhance visual salience and reduce peripheral distractions—the video was centrally positioned within the simulated supermarket. This strategic placement aimed to subtly influence the participants' food choices without offering explicit instructions. Prior research indicates that such visual cues can significantly influence food selection by increasing attention and

motivation through affective mechanisms (Dai et al., 2020).

Food-choice behavior was measured by calculating the proportion of healthy products selected by the participants. For example, if a participant chose 10 items and five were healthy, their healthy food choice score was 50%.

Procedure

The research procedure began with participant registration via Google Forms, followed by the selection of a preferred participation date using Google Calendar.

Upon arrival, each participant was individually assigned to either the experimental or the control group. The experimental group received an intervention consisting of health cues delivered via affective-based human motion picture media, whereas the control group did not receive any intervention.

All participants provided informed consent. The researcher explained the study objectives and procedures in detail to the participants. Participants completed a demographic questionnaire before beginning the task, during which they had 10 min to select food products of their choice within the simulated shopping environment. After completing the task, participants received a reward and a debriefing form outlining the study’s purpose, goals, and their rights and responsibilities.

Data Analysis

An independent t-test was conducted to examine whether statistically significant differences existed between the control and experimental groups, particularly in terms of the number of healthy items selected. This analysis was used to evaluate the effectiveness of the health cue interventions.

Table 1. Post-test scores of healthy food knowledge between groups (n = 186)

Group	n	Mean ± SD	Mean Difference (SE)	95% CI	p-value	Cohen’s d
Affective	93	17.64 ± 8.01	6.75 (1.01)	4.76 – 8.74	0.001	0.98
Control	93	10.89 ± 5.50				

An independent t-test was conducted to compare healthy food selection scores between the two groups. As shown in Table 2, the results revealed a statistically significant difference (p < 0.001; d = 0.98), indicating a strong effect of the intervention.

Ethical Considerations

This study was approved by the Health Research Ethics Committee of Universitas Negeri Semarang (Registration Number: 501/KEPK/FK/KLE/2024).

Result and Discussion

All participants were included in the final analysis, resulting in a total sample of 186 individuals equally divided into two groups: 93 in the affective (experimental) group and 93 in the control group. As shown in Table 1, the descriptive statistics indicate that the experimental group (mean = 17.64, standard deviation = 8.01) scored higher on healthy food selection than the control group (mean = 10.89, standard deviation = 5.50).

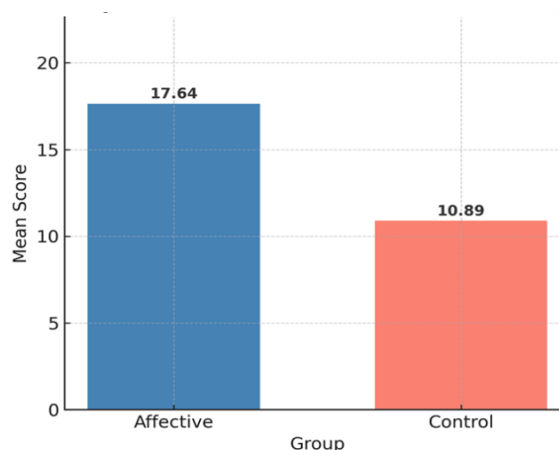


Figure 1. Comparison of mean scores between groups

This demonstrates that participants exposed to health cues through affective-based human motion picture media selected healthier foods, on average, than those in the control group who received no cues.

These findings provide robust evidence that health cues delivered through affective-based motion picture media significantly influence food choices, leading individuals to select a greater proportion of healthy food. The large effect size further suggests that these cues

play a meaningful role in promoting healthier eating behaviors.

Participants exposed to affective-based motion picture health cues selected significantly more healthy food items than those in the control group, with a large effect size (Cohen's $d = 0.98$). This underscores the strong influence of emotionally engaging visual stimuli on food-related decision-making. Consistent with affective response theory, such stimuli may activate automatic and heuristic processing pathways that guide behavior. The results also support the Theory of Planned Behavior (TPB) by demonstrating how affective attitudes shape an individual's intentions and actions. By embedding socially desirable norms (e.g., choosing healthy foods) within emotionally engaging content, the intervention reinforced health-oriented expectations, influencing food selection. Thus, H1 is supported.

Consistent selection of healthy foods is strongly influenced by environmental cues, including health-related visual stimuli. Exposure to affective-based motion pictures that portray healthy foods in a positive and emotionally appealing manner can foster favorable emotional associations, increasing both interest in and intention to make nutritious food choices (Ngqangashe & Backer, 2021; Turnwald et al., 2017). Social norms, such as supportive eating environments within families, peer groups, or institutions (e.g., schools and workplaces), further reinforce these behaviors (Ragelienė & Grønhøj, 2020; Rathi et al., 2025).

Health promotion strategies that integrate environmental cues and normative social influences have been shown to effectively encourage healthier eating behaviors. These findings align with the TPB, which posits that behavioral intentions are shaped by attitudes toward the behavior, subjective norms, and perceived behavioral control (Hojjati et al., 2025). In this context, health cues not only increase awareness of healthy food options but also evoke emotional responses that support positive attitudes toward healthy food consumption. Additionally, perceived social expectations, particularly in collectivistic cultures, reinforce subjective norms, thereby increasing the likelihood of health-promoting food choices (Danny Han & Orłowski, 2024). By enhancing individuals' perceived ability to access and select healthy foods, such cues may

also strengthen perceived behavioral control, further supporting the intention to engage in health-promoting behaviors.

The results emphasize the importance of environmental contextual factors in shaping dietary behaviors. Although this study did not directly measure peer or family influences, previous research by Gligorić et al. (2024) suggest that individuals are often unaware of the extent to which their food decisions are shaped by others around them, underscoring the powerful role of social norms. This perspective is presented as a theoretical context within the TPB framework, which highlights how environmental and normative factors shape behavioral intentions. Future research should further examine how positive attitudes, health-related beliefs, and affective cues interact with social influences to support sustained healthy eating behaviors.

Despite these compelling findings, this study had several limitations. First, the sample was homogeneous and consisted solely of university students, which may limit the generalizability of the findings to broader and more diverse populations. Second, although motion picture-based cues were effective in this study, the intervention was not compared with other forms of health cues (e.g., textual information or static images), limiting the conclusions about their relative effectiveness. Third, pre-test measurements or baseline comparisons were not included, making it difficult to assess changes in participants' initial food preferences. Finally, the potential influence of prior exposure to health-related media or messaging was not controlled for, which may have affected participants' responses. Future research should diversify the participant pool, incorporate baseline assessments, employ more ecologically valid environments, and examine both the comparative and long-term effects of various cue modalities and emotional priming strategies to better understand the mechanisms underlying behavioral change (Sheeran et al., 2016).

Conclusion

This study provides empirical evidence that affect-based health cues delivered through motion picture media significantly increase the likelihood of making healthy food choices. These

findings underscore the influential role of emotional engagement in shaping dietary decisions and highlight the potential of well-designed visual stimuli to influence health-related behaviors.

The results indicate that public health campaigns can incorporate emotionally engaging video content to subtly guide individuals toward healthier food choices in real-world settings, such as supermarkets, schools, and digital platforms.

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