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THE IMPACT OF HEALTH EDUCATION VIDEOS ON MOTHERS' THREAT AND EFFICACY PERCEPTIONS TOWARD ULTRA-PROCESSED FOODS

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ABSTRACT
There is a growing trend among families with children under two who consume ultra-processed foods (UPF) as their primary source of daily meals, but this can pose serious health risks. According to the Extended Parallel Processing Model (EPPM), health behaviors can be influenced by messages that alter a person's perception of threat and their ability to take effective action. This study aims to examine the effects of educational videos on perceived threat and efficacy among 55 mothers with infants aged 6-23 months. The research design uses an experimental method, which involved showing two health videos containing messages that threatened and encouraged maternal efficacy. The research participants were given a questionnaire to assess their perceived threat and efficacy. The Wilcoxon signed-rank test analysis revealed a significant difference in threat perception and efficacy when participants watched a video with a high-threat, high-efficacy message. The effect size calculation also shows that the magnitude of influence on each perception falls into the high category. This finding suggests that short video messages are effective in shaping mothers' perceptions of health behavior recommendations. These findings can benefit practitioners, who can disseminate information through short video screenings to increase their perceived efficacy.

Keywords: health promotion; perceived efficacy; perceived threat; video education.

INTRODUCTION

Ultra-processed foods (UPFs) are industrially produced items that contain additives such as refined sugar, salt, and preservatives to enhance their taste and shelf life. (Monteiro et al., 2019). Their growing consumption is a global concern, especially as they often opt for less nutritious meals due to convenience. (Monteiro, 2009). This trend is increasingly evident among children, including those under 2 years old in Indonesia. (Colozza, 2022; Green et al., 2019). High UPF intake is associated with serious health risks, such as obesity, high blood pressure, and elevated blood sugar, which can lead to chronic diseases like diabetes and cardiovascular conditions. (Akbarzadeh et al., 2017). In children, it also contributes to stunting and overweight problems, as UPFs may reduce appetite for nutritious foods and disrupt gut health. (Costa et al., 2023; Gomes et al., 2024; Louzada et al., 2015). Stunting itself increases the risk of long-term metabolic disorders. (Hoffman et al., 2000).

The consumption of UPF, with its chain distribution, has been widespread, including in marginalized areas with limited food options, such as the Cianjur Regency. Based on the verification and validation data from the at-risk families in the districts of Cianjur Regency, specifically Naringgul District, there are 1,022 stunted children. This area also has limited health facilities and a shortage of health professionals, making it difficult for the population to access medical treatment. Therefore, it is essential to prioritize health prevention programs in this area, including promoting healthy diets and reducing the consumption of ultra-processed foods among mothers of children under two years of age.

The role of mothers in family and children's diets is crucial, especially in many areas of Indonesia, where mothers have become the primary feeders. A mother holds the role of choosing the types of foods that will be given to their children. Meanwhile, the mean age of their children

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is 16.9 months, which suggests that when mothers have high confidence in preparing healthy foods, they are more likely to give their children more nutritious options. Unfortunately, some mothers still lack sufficient awareness and knowledge to prepare healthy diets for their children and sometimes rely on UPF as snacks or a primary meal.

In health communication, perceived threat and efficacy are considered essential aspects that can influence an individual's decision to take preventive action. The perceived threat is an individual's assessment of how serious and risky a problem is. Meanwhile, perceived efficacy is an individual's confidence in taking preventive action. One of the theories that uses this assumption is the Extended Parallel Process Model (EPPM) by Witte (1992). Witte stated that if a message only triggers threat perception, it leads the individual to feel fear and try to avoid it. However, if it can also provoke an efficacy perception higher than the threat perception, that individual will be more likely to do the suggested behavior.

EPPM also explained that the two central concepts for threat are perceived susceptibility and perceived severity (Witte, 1994). Meanwhile, efficacy contains self-efficacy and response efficacy. Perceived susceptibility is an individual's perception of their likelihood of contracting a disease. In addition, perceived severity is defined as the individual's perception of the extent to which the condition affects them. Another concept, self-efficacy, refers to an individual's confidence in performing the suggested behavior. Response efficacy, on the other hand, refers to an individual's belief in the Effectiveness of the suggested behavior in preventing the disease.

Besides health education content, the media or channels used to disseminate information have become an essential topic of discussion. Several studies have shown that common media used are video-based health communication. (Parvez et al., 2023; Roess et al., 2017). Another study focusing on video-based communication demonstrates that video can be highly effective for delivering health recommendations, particularly in breast examinations and health education. (Tuong et al., 2014). Video-based education can be effective because it is more engaging and easier to process than other media. (Yousef et al., 2014). Unfortunately, there is still limited research focusing on how video can affect mothers' perception of the threat and efficacy of processed food, especially in rural areas with marginalized groups.

Therefore, this study aims to assess the impact of a health education video incorporating threat and efficacy messages on mothers' perceptions of children aged 6–23 months in rural areas.

The novelty of this study lies in its experimental examination of how short health education videos that simultaneously manipulate threat and efficacy messages influence mothers' perceptions of the risks of ultra-processed foods for children aged 6–23 months, a population and communication approach that remains underexplored.

METHOD

The study population comprises mothers of children aged 6-23 months in Malati and Wangungjaya Villages, Naringgul District. The total number of children in the population is 294. The study's sampling method employs purposive sampling, utilizing several inclusive and exclusive criteria. The inclusion criteria are mothers of children aged 6-23 months who can read and write and are Naringgul citizens. In contrast, the exclusive criteria are mothers who have seen this video before the experimental study. Researchers visited *Posyandu*, the center of integrated care, where mothers brought their children aged 0 to 59 months for height and weight measurements and to receive additional food. We then selected participants who met the inclusion criteria, including those with children aged 6 to 23 months who could read and write.

This study employs a post-positivist paradigm, which seeks to understand a phenomenon in light of existing theories while not fully accepting any one theory as definitive. This study used a 2-factor experimental design. The manipulated factors are threats (high and low) and efficacy (high and low). We visited four *Posyandu(s)*, with each having 11 participants and one with 15 participants, totaling 55 participants.

In this experimental study, we prepared two. Short videos: one containing a message with high threat and high efficacy, and another containing low-threat and low-efficacy messages. The video's format is a narration about mothers with two conditions. Both videos are 1 minute and 58 seconds long. To ensure that this content provides accurate information, we review the narration with a nutritionist and a public health expert from Universitas Indonesia and confirm that the messages are factual. A communication student from Padjadjaran University then narrates this video. The first video showed the condition of mothers who have children with a high risk of stunting, which can lead to future metabolic syndrome, and then being informed by health cadres in the *Posyandu* to change their feeding behavior. The mother then attempted to change her children's meals to more minimally processed foods, which improved their appetite and growth. Another video showed a mother with a lower risk of stunting and metabolic syndrome, but still being advised to prepare less UPF for her children. In this video, the mother found it hard to change the feeding practices and still had a problem addressing her issue with the child, who wanted to consume a lot of UPF. This message creation refers to another study by Ooms et al. (2015), which employed the same theory but was subsequently modified to align with the theme.

We showed both videos to the participants and then asked them to complete a multiple-choice questionnaire. To minimize the effect of one video on the other, we placed the demographic data between the two videos. We also randomized the first video to be shown in four places we visited to see the effect firsthand.

The questionnaire to understand participants' perspectives consists of four parts. In the threat perception section, there are questions about the perceived susceptibility and perceived severity of diseases related to UPF, such as obesity, diabetes mellitus, hypertension, and heart attack (16 questions). Meanwhile, the concept of perceived efficacy comprises perceived response efficacy and perceived self-efficacy, which asks participants how confident they feel about their ability to provide healthier foods and reduce UPF, as well as how effective they think reducing UPF and offering more minimally processed foods will be for the children's health (4 questions). The scale used in this research is ordinal, using a four-level Likert scale. This scale level is used to minimize the neutral answer, which is often used by those with lower educational status. Each measurement has been tested for validity and reliability, with both validity tests yielding Pearson correlation coefficients of 0.7 or higher and Cronbach's alpha scores of 0.66 for the efficacy scale and 0.8 for the threat construct. Meanwhile, the collected demographic data includes the mother's age, education, number of children, and the children's ages. We also collect data about whether they have been informed about UPF before and the source of the information.

Data collection took place over five days, from 8 February to 11, 2025. The survey was to be completed anonymously and willingly by the participants. No personal information, including names, phone numbers, or email addresses, was collected to protect the participants' privacy and anonymity. Furthermore, the non-response rate is not documented due to the survey's post-test-only design. The study's goal and the mothers' rights as volunteers were explained to them before they participated in the survey.

The collected data is then analyzed using SPSS version 23. First, we conducted a descriptive analysis to examine the participants' demographic data. The effect of the educational video on altering the mother's perception of UPF risk and its efficacy in reducing it was assessed using the Wilcoxon signed-rank test. Nonparametric analysis is used to compare two similar samples. (Bagkavos & Patil, 2021). Participants' perceptions were examined twice after viewing both of the videos. To ascertain whether the narration video significantly influenced participants' perceptions, we defined scores 1-2 as low perception and scores above two as high perception. We also measure the p-value and effect size from the test. Calculating the p-value helps us understand the statistical significance of the results. When the p-value is lower than 0.05, we interpret it as statistically significant, meaning the result is unlikely to have occurred by chance and is expected to occur less than 5% of the time.

This study calculated the effect size to measure the magnitude of change in participants'

perception after viewing the educational video. Effect size, expressed in standard deviation units, quantifies the strength of a treatment effect and offers insights into the extent of differences between groups or changes over time within a group. Unlike statistical significance tests, which only indicate the presence of an effect, effect size reveals the practical importance of findings by identifying small but meaningful changes that may otherwise be overlooked. (Patel, 2020). It can be reported as Cohen's d or the Standardized Mean Difference (SMD). Effect size is typically determined by dividing the absolute value of the standardized test statistic (t) by the square root of the sample size (n), as shown in Equation (1):

$$\text{Effect Size} = t \div \sqrt{n}.$$

Cohen's d, a widely used metric, is calculated by dividing the difference between two means by their pooled standard deviation. Based on conventional benchmarks, a d-value of 0.20 indicates a small effect, 0.50 a moderate effect, and 0.80 a substantial impact. A larger effect size suggests a more significant change in intention. In contrast, a more negligible effect reflects minimal change, offering a deeper understanding and better context for interpreting the study's results. This research is also part of a broader experiment that has been ethically approved by the Research Ethics Committee (KEP) of Padjadjaran University, as cited in KEP letter number 105/UN6.KEP/EC/2025.

RESULTS

We evaluate mothers' perceptions of threats and emotions. Table 1 presents the demographic data of 55 mothers who participated.

Table 1: Demographics of Respondents.

Demography	Frequency (N=53)
Age of Mothers in Year	31 (SD 7.23)
Number of children	2.36(SD 1.1)
Mother's last education	16.92 (SD 7.16)
Completed primary education	39.6% (21)
Completed lower secondary education	41.5% (22)
Completed higher secondary education	18.9% (10)
Completed higher education	0
Children's average age in months	
Informed about UPF	
Yes	67,9%
No	32,1%
Source of Information (n=37)	
Midwife	40,5%
Social media	48,6%
Television	10,8%

Source: Researcher's Collection, 2025.

Based on Table 1, the demographic data of 55 mothers who participated. These mothers come from the rural district in Cianjur and have mostly finished secondary school. The mean age of their children is 31 (SD 7.23), and they have an average of two children (SD 1.1). Meanwhile, the mean age of their children is 16.9 months, ranging from 6 to 23 months. 48% of mothers said they had been informed about UPF and its dangers, primarily from social media.

Table 2: The Difference in Mean of Threat and Efficacy Perception Score after Watching Different Videos.

Perception	Video type	Mean	SD	Z	p-value	Cohen's d
Threat Perception	Low threat	1.90	.57	-5.16	0.00	0.83
	High threat	2.40	.63			
Efficacy perception	Low efficacy	2.55	.40	-5.35	0.00	0.97
	High efficacy	2.98	.45			

Source: Researcher's Collection, 2025.

Table 2 shows the average perception score for each group after watching the two videos. There are differences in efficacy scores between low-threat, low-efficacy, and high-threat, high-efficacy videos. The average threat perception score for low-threat versus high-threat videos is 1.9 and 2.4, respectively, while the efficacy perception score for low- and high-efficacy videos ranges from 2.55 to 2.98. Additional statistical tests using the Wilcoxon signed-rank test show that the increase in the number from the low to the high group is statistically significant ($Z = -5.16$, $p < 0.05$). The efficacy score also yields the same statistically significant result ($Z = -5.35$, $p < 0.05$). We also measure the effect size using Cohen's d equation. The effect sizes for threat and efficacy are 0.83 and 0.97, respectively. As stated by Parvez et al. (2023), a score above 0.5 can be interpreted as indicating a high Effect.

DISCUSSION

The findings of this study demonstrate that video messaging is a potent tool for strategically altering key psychological predictors of behavior change. The statistically significant increase in threat perception among participants who viewed the high-threat video ($M = 2.40$, $SD = 0.63$) compared to the low-threat video ($M = 1.90$, $SD = 0.57$), supported by a large effect size (Cohen's $d = 0.83$, $p < 0.001$), confirms that audiovisual content can effectively heighten an audience's sense of susceptibility and severity. Crucially, the parallel finding regarding efficacy perception—where the high-efficacy video elicited a stronger response ($M = 2.98$, $SD = 0.45$) than its low-efficacy counterpart ($M = 2.55$, $SD = 0.40$) with an even larger effect size (Cohen's $d = 0.97$, $p < 0.001$)—provides robust empirical support for a core tenet of fear appeal theories like the Extended Parallel Process Model (EPPM) (Witte, 1992). Part of the theory explains that after individuals receive stimuli from the outside world, their perceptions or beliefs about the world might change, and so might their efficacy perspective.

Our results demonstrate that video messages can significantly alter perceptions of threat and efficacy, with substantial practical implications for public health nutrition campaigns. The challenge of reducing ultra-processed food (UPF) consumption provides a clear context for this need. Research shows that consumers, particularly young adults, often possess a solid understanding of the health threats posed by UPFs (high threat perception), yet continue to consume them regularly due to overwhelming barriers to efficacy. (Shannon & Avery, 2025). These barriers include perceptions of low self-efficacy (e.g., lack of time or cooking skills) and low response efficacy (e.g., beliefs that healthier alternatives are less affordable and convenient). Furthermore, the study by Ilieva et al. (2025) quantitatively confirms that general health consciousness is insufficient to change attitudes; instead, specific knowledge, social norms, and environmental concerns are the key drivers. This directly supports the value of our experimental approach: our high-efficacy video was designed to overcome these precise barriers by enhancing specific knowledge and modeling effective responses, thereby increasing both self-efficacy and response efficacy. The enormous effect size observed in efficacy perception (Cohen's $d = 0.97$) is particularly critical, as Ilieva et al.'s model establishes that attitude—which is heavily influenced by such efficacy beliefs—is a primary determinant of behavioral intention and, ultimately,

consumption. Therefore, our findings suggest that interventions aimed at reducing UPF consumption must move beyond simply scaring individuals about the threats and must instead focus on crafting messages that directly bolster efficacy by offering practical, affordable, and convincing solutions to the real-world barriers identified in consumer research.

This result also supports the idea that video and narration forms of health promotion might yield the expected effect, as shown by the calculated effect size. A high effect size is also observed in similar research. (Parvez et al., 2023). Another study focusing on the effect of educational videos on health behavior also supports the idea that educational videos emphasizing modeling behavior may increase the likelihood of altering the suggested behavior. (Tuong et al., 2014). Myrick and Oliver (2015) Noted that a public service announcement that evokes emotional responses may enhance individuals' beliefs and motivation. It also noted that different results might be seen from another educational video, but it explained that this hard acceptance is seen in behavior related to addiction. Since reducing UPF is not as hard as stopping alcohol or cigarette addiction, it is still possible for mothers to change their children's meals into more minimally processed foods.

In the context of mothers living in rural areas, this combination of a high perception of threat and efficacy serves as a crucial starting point for promoting healthier food options. This result underscores that message efficacy is not merely a complementary element but a powerful and independently manipulable component of persuasive communication. The fact that both constructs were successfully influenced in isolation suggests that health campaigns can be precisely engineered, moving beyond generic fear-based messaging to a more nuanced approach that strategically balances threats with empowering solutions.

However, these findings are tempered by the study's limitations, including the use of self-report measures and an immediate post-exposure design, which leave unanswered questions about the long-term behavioral impact. This study also employs an ordinal and quantitative approach, which does not provide a deeper understanding of how it affects mothers emotionally. It also focuses on seeing the effect of a video with a limited number of participants, so it is not meant for generalization. Future research should therefore investigate the longevity of these perception shifts and their ultimate translation into actual behavior. It can also incorporate a qualitative approach to explore the subjective experiences of mothers who receive threat and efficacy stimuli. Furthermore, a quantitative approach with a broader range of participants and variables may be beneficial in gaining a deeper understanding of the phenomenon.

Although this study has not directly measured the mother's acceptance by observing their intention or behavior, another study has supported the EPPM theory, suggesting that this high combination of both perceptions may result in behavioral change. (Carey & Sarma, 2016; Chen & Yang, 2019; Gharlipour et al., 2015; Parvez et al., 2023). This finding is important because, aside from threatening mothers with what might be lost in their children's future, it also emphasizes what mothers can do with their children's food. This message can also be replicated as part of a communication strategy by the healthcare provider or health promoter at a later time.

Some practical implications of this finding include tailored video campaigns and the development of localized, culturally appropriate videos that highlight the real-life consequences of UPFs (e.g., stunting, chronic diseases), using relatable visuals (e.g., comparisons between healthy and malnourished children). This study also suggests that, for maximum Effectiveness, public health messages must devote substantial effort not only to illustrating a threat but also, and perhaps more importantly, to clearly demonstrating tangible, achievable, and practical solutions to their audience. This includes simple, actionable steps, such as substituting UPFs with affordable, traditional foods like bananas or sweet potatoes for packaged snacks. Furthermore, we should include a community-based dissemination that partners with rural health workers to screen videos during *posyandu*.

Overall, these findings directly address the research objective by demonstrating that health education videos integrating threat and efficacy messages can significantly shape maternal

perceptions regarding ultra-processed food consumption in early childhood. From a global perspective, this study underscores the relevance of theory-driven, video-based health communication as a scalable strategy for improving parental perceptions, offering practical insights for designing effective nutrition communication interventions across diverse cultural and resource settings.

CONCLUSION

The rising consumption of ultra-processed foods (UPFs) among children under two years old poses significant health risks, including stunting, obesity, and metabolic disorders. To address this, health communication strategies based on the Extended Parallel Processing Model (EPPM) can be effective by shaping perceptions of threat and efficacy. This study examines the effect of educational videos on mothers' perceptions of threat and efficacy regarding UPF consumption in infants aged 6–23 months. Perceptions were measured using validated questionnaires assessing threat perception (severity and susceptibility of UPF-related health risks) and efficacy perception (self-efficacy and response efficacy in reducing UPF intake). Using an experimental design, participants were shown high-threat/high-efficacy videos, followed by post-intervention assessments. Wilcoxon signed-rank tests confirmed significant increases in both threat and efficacy perceptions, with large effect sizes. These findings demonstrate that targeted messaging can effectively alter maternal perceptions, providing a practical basis for future health campaigns to reduce UPF consumption among young children.

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