ORIGINAL ARTICLE

Rational, Humor, or Fear: User Acceptance of Oral Health Promotion through Different Social Marketing Appeals

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ABSTRACT

Introduction: Understanding user acceptance of social marketing appeals is crucial for effective health campaigns, particularly in promoting oral health prevention, such as oral cancer. This study evaluated the acceptance of oral health promotion media on oral cancer using three social marketing appeals. **Materials and Methods:** A randomised controlled trial was conducted to assess user acceptance of three social marketing appeals (rational, humour, and fear) for oral cancer prevention. Participants were randomly assigned to one of three video groups and completed a validated 23-item questionnaire using a five-point Likert scale, evaluating various aspects of user acceptance of digital oral health promotion. **Results:** This study examined user acceptance of three social marketing appeals (rational, humorous, and fear-based) for oral health promotion among 322 participants (51.2% male, 48.8% female). The videos were similarly rated for social interaction, intrusiveness, and informativeness. The humorous appeal was rated highest for presentation style ($p < 0.05$), while the rational appeal was most effective in raising awareness of the target health behaviour ($p < 0.05$). Although fear-based appeals had the highest ratings for help-seeking intention, this was not statistically significant ($p > 0.05$). Overall, humorous appeals were perceived as most effective in presentation, and rational appeals in raising awareness. **Conclusions:** The study found that humorous appeals excelled in social interaction, informativeness, and presentation style, while fear-based appeals were most effective in educating about oral cancer. Rational appeals received lower ratings, particularly in presentation and effectiveness, emphasizing the importance of engaging content in social marketing.
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INTRODUCTION

Oral health is an essential component of overall well-being, but it remains a significant public health challenge in Malaysia Recent studies highlight the significant oral health challenges facing Malaysia. A 2022 report by the World Health Organization (WHO) noted that oral diseases, including dental caries, periodontal diseases, and oral cancers, remain prevalent in Malaysia, posing significant public health challenges (1). These findings underscore the urgent need for enhanced public health initiatives and preventive measures to address oral health issues in Malaysia.

Oral cancer, in particular, poses a serious public health threat in Malaysia, but it is largely preventable by avoiding risk factors. Recent studies have identified several key risk factors contributing to the high incidence of oral cancer including tobacco smoking, alcohol consumption, HPV infection (2), and genetic predisposition (3). Recent studies indicate that awareness of oral cancer remains significantly lower compared to other types of cancer. For instance, a study found that only 52.9% of participants were aware of oral cancer, a rate considerably lower than the awareness levels reported in other countries, which range from 84.2% to 95.6% (4). Another study reported that 68.4% of individuals knew about the existence of oral cancer, with awareness significantly influenced by gender and higher education, but not by age (5).

This disparity in awareness underscores the need for

targeted educational initiatives to improve public knowledge about oral cancer. Many people lack knowledge about the high-risk behaviours, early symptoms, and preventive measures associated with oral cancer (6), with even dental school patients in Malaysia having only a moderate level of awareness (7, 8). In Malaysia, oral squamous cell carcinoma (OSCC) is responsible for 10.6% of hospital deaths (9) and 67.1% of cases are diagnosed at advanced stages, mainly due to insufficient awareness (6).

Given the unique risk factors and demographics in Malaysia, oral cancer remains a critical area for research and intervention. The core aspects of oral cancer, including risk factors, diagnosis, and treatment, remain constant, underscoring the importance of public education and awareness initiatives. Prevention remains the most cost-effective strategy for reducing cancer incidence and improving quality of life (10).

Therefore, implementing oral health education through mass media or targeted programs, particularly for specific groups such as students and young adults, can significantly raise awareness (6). In addressing this need, social marketing, a discipline that adapts commercial marketing strategies to promote social good, has emerged as a powerful tool for influencing health behaviours (11). These campaigns have the potential to increase public awareness, strengthen dental education, and encourage preventive behaviours (10). Through social marketing, it aims to create tailored campaigns that resonate with individuals and encourage them to adopt healthier behaviours. In the context of oral health promotion, social marketing can play a crucial role in motivating individuals to engage in regular oral hygiene practices, seek preventive dental care, and reduce behaviours that increase the risk of oral diseases (12).

The rise of digital technologies has significantly enhanced the potential of social marketing for public health. The widespread use of the internet, social media, and mobile devices has transformed these platforms into vital channels for health communication (13). Digital platforms facilitate the delivery of personalized and interactive messages to diverse audiences in real-time. For example, social media enables the sharing of health information through engaging formats such as videos and infographics, while mobile apps offer personalized reminders and educational resources to help users manage their oral health. Additionally, websites and online forums foster community engagement and peer support, reinforcing collective responsibility for oral health (14).

Despite these advantages, the effectiveness of digital oral health promotion is contingent upon the strategies used to engage and persuade users. Emotional appeals, example as humorous, and fear-based approaches, are particularly influential in capturing attention and driving behaviour change. These appeals leverage distinct psychological mechanisms to impact the audience, highlighting the need for tailored strategies to maximize the effectiveness of digital health campaigns (15).

Rational, humorous, and fear-based appeals are common strategies used in health communication to promote behaviour change. Rational appeals rely on clear, evidence-based information to persuade the audience by appealing to their logical reasoning, encouraging informed decision-making about oral health. Humorous appeals engage audiences through entertainment, making health messages more memorable and shareable, thus increasing their impact and reach (16). In digital oral health promotion, humor can break through informational clutter, capturing attention in a way that serious messages might not (17). Fear-based appeals, on the other hand, aim to motivate behaviour change by evoking concern about potential negative consequences, such as the risks of poor oral health. However, these must be used with caution to avoid overwhelming the audience, as excessive fear can lead to disengagement (18). Recent studies have highlighted the effectiveness of fear appeals in promoting health behaviour, showing their potential to increase risk perceptions and drive actions such as vaccination and screenings, especially when used with moderation (19, 20).

Despite the widespread use of different appeals in social marketing, there remains a limited understanding of how these appeals influence user acceptance, particularly in the realm of digital oral health promotion. User acceptance is a crucial determinant of the success of health communication campaigns, as it refers to the degree to which individuals are willing to engage with and adopt the conveyed messages. High levels of user acceptance are essential for driving actual behaviour change, rather than merely raising awareness (21, 22). Several key factors influence user acceptance, including the perceived relevance of the message, the emotional impact it generates, the credibility of the source, and the overall appeal of the content. For instance, a message that directly addresses an individual's personal health concerns is more likely to be accepted and acted upon(23). Similarly, messages that evoke strong emotional responses argument tend to be more persuasive and memorable.

Thus, this study evaluates user acceptance of rational, humorous, and fear-based appeals in digital oral health promotion for social marketing, offering insights to enhance public health campaigns and awareness related to oral cancer, ultimately encouraging more proactive health behaviours.

MATERIALS AND METHODS

Research Instruments

Three distinct videos were developed to disseminate

information on oral cancer through digital platforms. The integration of oral health education within these videos required the implementation of a digital storytelling framework, ensuring a structured and systematic approach to content development. This study adopted the digital storytelling process as conceptualized by Jason B. Ohler (2013), which consists of four key phases: pre-production, production, post-production, and performance & distribution (24, 25).

The videos were created using Canva, a user-friendly graphic design tool. The videos incorporated a combination of text animations, background music, and transitions to enhance engagement. After finalizing the design, the videos were exported as MP4 files to ensure compatibility across various devices, including laptops, tablets, and handphones, with each video designed to have a duration of less than four minutes. Example of storyboard using Canva Application shown in Figure 1 as well as video editing process in Figure 2.

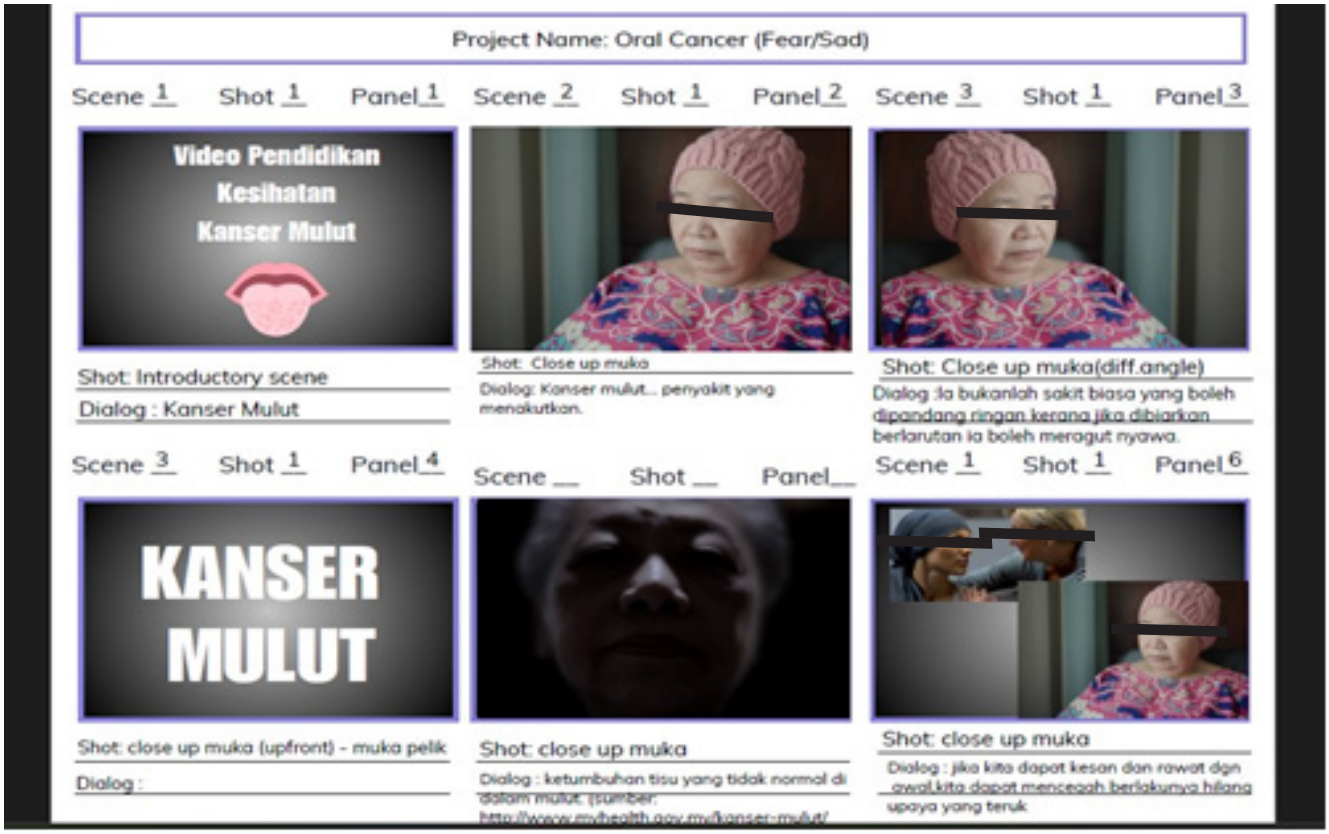

Figure 1: Example of Storyboard (Fear Appeal) using Canva Application

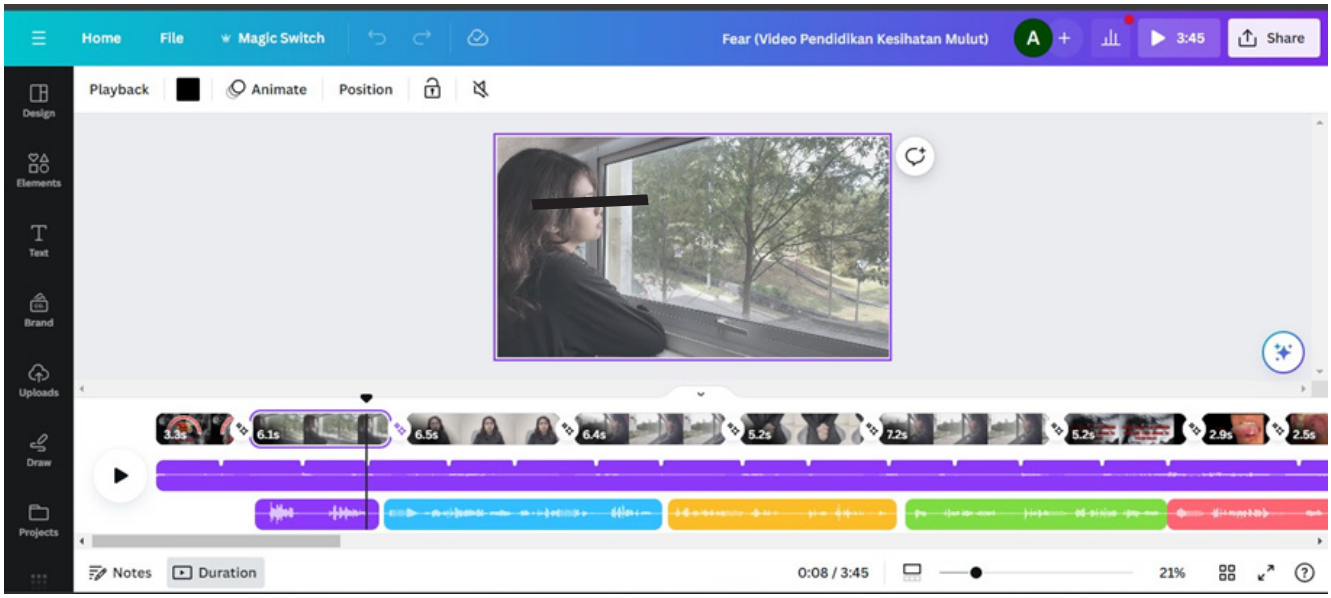

Figure 2: Production Phase -Video Editing using Canva Application

Video 1 utilized a rational appeal and served as the control group, Video 2 incorporated a humorous appeal, and Video 3 employed a fear-based approach. Expert consultations guided the development of the tone, music, and background colours for the oral health education video on oral cancer. The rational appeal featured an authoritative tone, calming music, and neutral colours such as blue to highlight factual information, while the humor appeal used a light-hearted tone, upbeat music, and vibrant colours such as yellows and oranges) to create an engaging atmosphere. The fear appeal adopted a sombre tone, melancholic music, and muted colours, greys, to emphasize the emotional impact of oral cancer, supported by real images to encourage proactive health behaviour.

The video integrated essential information on oral cancer, including its definition, location, risk factors, and oral self-examination. Each video was reviewed and validated by a panel of five experts from relevant fields, including oral and maxillofacial surgery, dental public health, and graphic arts and visual communication. The evaluation ensured content accuracy and clarity for the target audience using the Patient Education Materials Assessment Tool (PEMAT) (26).

Additionally, a questionnaire adapted from the extended Technology Acceptance Model (TAM) (27) was modified, translated into Bahasa Melayu, and Exploratory Factor Analysis (EFA) was conducted to assess the underlying structure and ensure the validity of the questionnaire items. Subsequently, it was validated by seven expert panels in relevant fields. This questionnaire was structured into distinct domains that capture essential factors such as perceived usefulness, perceived ease of use, intention to use, and overall satisfaction with the system. Each question in the survey is referred to as an 'item' (27). Total of 23 items were included in the questionnaire. Responses were recorded using a 5-point Likert scale, ranging from (1) Strongly Disagree to (5) Strongly Agree, providing a detailed assessment of user attitudes and perceptions.

Study Design

This study was designed as a randomised controlled trial (RCT), however, the trial was not previously registered as it did not involve clinical interventions requiring registration under applicable guidelines. The trial is not clinical in nature and does not fall under the scope of mandatory registration policies defined by major trial registries, which typically focus on health related interventions with medical or therapeutic implications.

Methods

The sample size was determined using G*Power 3.1.9.7, with a significance level of 0.05 and power of 0.95, resulting in a required sample of 328 participants across three arms, accounting for a 30% dropout rate. A total of 322 participants with diverse sociodemographic factors (gender, age, education level) were selected. Eligibility included participants aged 18 and above who understood Bahasa Melayu. Exclusion criteria included those not meeting the language requirement, diagnosed with oral cancer, having close family members with the condition, having learning or mental disabilities, or being healthcare workers.

Prior to the main study, a pilot study with 36 participants was conducted using the same inclusion and exclusion criteria as the main study. This preliminary phase was crucial for evaluating the feasibility of the research instruments, including both the videos and the questionnaires. It allowed for the refinement of video content clarity and helped identify potential issues related to participant engagement and comprehension. The insights gained from this pilot study were used to address any issues and enhance the methodology before proceeding with the main study.

For the main study, a three-arm randomized controlled trial (RCT) was conducted at an Urban Transformation Centre (UTC) in Klang Valley. A systematic sampling method was employed, selecting only participants with even waiting numbers to ensure a balanced representation across gender, age, and education level. Subsequently, a stratified random sampling approach was employed to assign participants to different digital oral health promotion videos. Twelve subgroups were established, each represented by a transparent mini storage box containing 27 or 28 folded papers labelled with the numbers 1 (rational), 2 (humor), or 3 (fear). Participants randomly selected a paper from their designated subgroup to determine their assigned video. Those who watched the non-emotional rational appeal video were considered the control group, in comparison to the groups exposed to emotional appeals of fear and humour. Participants were blinded to the type of video they were assigned to watch.

The participants were placed in a designated isolated location and provided with earphones to ensure minimal distractions, allowing them to focus entirely on the video presentation as shown in Figure 3.

Figure 3: Participant Placement: Isolated Location with Earphones

Data Analysis

Data was collected through surveys administered to participants using standardized instruments Data were recorded manually and entered into a digital database (Microsoft Excel® 365®). The data was then transferred to IBM SPSS Version 29.0 using double-entry verification to minimize errors. Each variable was labelled and formatted for analysis. The chi-square test was employed to assess associations between categorical variables.

RESULTS

A total of 322 participants watched videos with rational (34%), humorous (33%), and fear-based (33%) appeals (Table I). As shown in Table II, the study included 165 males (51.2%) and 157 females (48.8%), reflecting a nearly equal gender distribution. Participants were divided into three age groups: early adulthood (34.2%), middle adulthood (33.8%), and elderly (32.0%), demonstrating a relatively even spread across different life stages. Educational levels were also evenly distributed, with 50.0% of participants having completed high school or below and 50.0% having attained tertiary education or higher, indicating a balanced representation in terms of education.

Table I: Total Respondents for Pre and Immediate Responses (N=322)

Video	Number of participants	Percent (%)
Rational	108	34.0
Humour	107	33.0
Fear	107	33.0
Total	322	100.0

Table II: Total Respondents' Sociodemogprahic Characteristics (N=322)

Sociodemographic	Number (%)
Gender	
• Male	165(51.2)
• Female	157(48.8)
Age grouping	
• Early adulthood	110(34.2)
• Middle adulthood	109(33.8)
• Elderly	103(32.0)
Educational level	
• High school level & below	161(50.0)
• Tertiary level & above	161(50.0)

Statistical significance was established using a threshold of $p < 0.05$, with p-values below this level indicating statistically significant differences or associations.

All three appeals were positively received in terms of social interaction, with mean scores between 4.27 and 4.50, but no significant differences were found ($p > 0.05$). The fear appeal was slightly perceived as more bothersome compared to the rational and humorous appeals, yet this was not statistically significant either ($p = 0.300$). In terms of disappointment, the fear appeal had the highest mean score, followed by the rational and humorous appeals, with no significant differences observed ($p = 0.398$). All appeals showed nearly identical levels of irritation, and there were no significant differences ($p = 0.502$). For informativeness, the fear appeal was rated highest, but differences among the appeals were not significant ($p > 0.05$). The humour appeal was significantly preferred in terms of presentation style ($p = 0.025$). The significant different between the appeals in terms of perceived usefulness with p-value equals to 0.016. All appeals were deemed equally appropriate for various platforms and settings, with no significant differences in perceived ease of use ($p > 0.05$). Further user acceptance ratings of video presentations are shown in Table III.

Table III: User Acceptance Ratings of Video Presentations Across Different Items

Domain of user acceptance (Items) (N=322)	Appeal (Video)	Mean (SD)			p-value
		Rational appeal	Humor appeal	Fear appeal	
Social Interaction (To promote social interaction- in terms of getting help)	This video promotes me the opportunity to have lively, interesting, and engaging interaction with others	4.27(0.61)	4.41(0.63)	4.35(0.69)	0.400
	In general, I think that this video strongly facilitates social interactions	4.35(0.57)	4.50(0.60)	4.44(0.69)	0.216
	Overall, I am very satisfied with the social aspects of the video	4.39(0.58)	4.42(0.71)	4.38(0.68)	0.368
Intrusiveness	This video is an insult to one's intelligence.	1.88(0.75)	1.69(0.71)	1.82(0.80)	0.651
	This video is bothersome.	1.68(0.58)	1.55(0.54)	1.69(0.68)	0.300
	This video is disappointing.	1.57(0.58)	1.50(0.52)	1.65(0.66)	0.398
	This video is irritating.	1.57(0.58)	1.57(0.63)	1.60(0.60)	0.502
Informativeness (1) accuracy-credibility of content, and/or (2) scientifically correct information (3) evidence-based practices	This video is a good source of information for general health [oral cancer awareness]	4.53(0.62)	4.55(0.60)	4.56(0.66)	0.614
	This video is a good source of information for oral cancer [oral) cancer awareness]	4.52(0.54)	4.54(0.70)	4.62(0.58)	0.171
	This video is a good source of updated information	4.41(0.58)	4.45(0.68)	4.51(0.63)	0.189
Video attitude (Appropriateness)	The presentation style of this video is appealing.	3.93(0.78)	4.30(0.72)	3.97(0.86)	0.025
	The theme of this video is interesting.	4.02(0.77)	4.36(0.63)	4.14(0.78)	0.156
	This video fits well with my needs	4.12(0.71)	4.24(0.90)	4.12(0.81)	0.084
Perceived Usefulness	This video is likely to increase awareness of the importance of addressing [oral cancer]	4.55(0.50)	4.50(0.69)	4.55(0.52)	0.016
	This video is likely to increase knowledge/ understanding of oral cancer	4.48(0.60)	4.55(0.66)	4.59(0.53)	0.054
	This video is likely to change attitudes toward improving [positive health behavior]	4.34(0.70)	4.43(0.69)	4.51(0.59)	0.308
Perceived Ease of Use	This video is appropriate to be shown in social media	4.34(0.67)	4.41(0.70)	4.42(0.70)	0.556
	This video is suitable to be viewed on a handheld device (eg: handphone, tablet)	4.34(0.61)	4.43(0.63)	4.46(0.70)	0.340
	This video is suitable to be shown in healthcare facilities setting (eg: clinic waiting area)	4.47(0.54)	4.54(0.55)	4.54(0.60)	0.515
	This video is suitable to be shown in non-healthcare related setting (eg: public waiting area/malls)	4.19(0.83)	4.32(0.81)	4.28(0.83)	0.717
Help seeking intention	This video is likely to encourage further help seeking [oral cancer screening] (if it's required)	4.29(0.60)	4.36(0.66)	4.42(0.63)	0.418
	This video is likely to increase intentions/motivation to address [oral cancer screening]	4.33(0.64)	4.39(0.64)	4.49(0.57)	0.512
	I will recommend this video to others.	4.30(0.60)	4.33(0.76)	4.39(0.67)	0.297

*Video 1 = Rational, Video 2 = Humor, Video 3 = Fear

DISCUSSION

This study assessed user acceptance of three video appeals, rational, humorous, and fear-based within the context of social marketing for digital oral health promotion. The findings revealed that all three appeal types were positively received across most items, with only slight significant differences observed. This consistency indicates that each appeal is similarly effective in engaging users.

The humour appeal's higher score for presentation style highlights its significant role in health communication, particularly in capturing and retaining audience attention. Humour's effectiveness in engaging viewers can be attributed to its ability to create an enjoyable and relatable experience, which fosters a positive emotional response (28, 29). By incorporating humour, health messages become more approachable, reducing resistance and skepticism, which often accompanies health communication efforts (30).

Humor not only makes the content more engaging but is also perceived to enhance message retention as well as, humour can facilitate better recall of information by making the content more memorable and enjoyable. This is particularly important in health communication, where retaining and acting upon information can significantly impact health behaviours (31). The positive emotional experience elicited by humour helps overcome cognitive barriers and resistance to the message, making it more effective in persuading and educating the audience (32).

Moreover, humour's ability to reduce resistance to health messages aligns with its higher ratings in presentation style. By creating a relaxed and enjoyable atmosphere, humour mitigates the defensive responses that can hinder the effectiveness of health communication. This positive emotional engagement not only improves the reception of the message but also fosters a more open and receptive attitude towards health information. However, while humour improved engagement, its slightly lower perceived usefulness suggests that it may not have communicated the seriousness of oral cancer as effectively as the rational or fear-based appeals.

In contrast, the rational appeal was rated as more effective for raising awareness about oral cancer. This suggests that viewers value the factual and logical presentation of information when it comes to understanding the importance of health behaviours. Rational appeals, which emphasize evidence-based information and logical reasoning, can effectively convey the seriousness and importance of health issues, thereby fostering a deeper understanding among viewers. This approach is particularly valuable when addressing audiences who prioritize accuracy and evidence over emotional engagement. All videos were similarly rated for ease of use, this uniformity suggests that the format and content of the videos were generally accessible and well-received across all appeals. Given that oral cancer is a serious health issue, the rational appeal helps viewers recognize the urgency of adopting health behaviours.

Similarly, fear appeals were also recognized for their effectiveness in raising awareness about oral cancer. Fear appeals leverage the psychological mechanism of evoking concern or anxiety about potential negative outcomes associated with unhealthy behaviours. By highlighting severe consequences of inaction, such as the risks of oral cancer, fear appeals aim to prompt behavioural changes through increased urgency and perceived threat (33). This method can be powerful in motivating individuals to engage in preventive actions, as it effectively captures attention and instils a sense of urgency (34). However, the effectiveness of fear appeals can vary depending on the individual's tolerance for fear-inducing content and their psychological response to the presented threats (35). The study found that fear appeals raised awareness but did not always encourage a balanced emotional response, as viewers may be overwhelmed by the severity of the message.

As for humorous appeal, with a slightly lower mean score in comparison to the other two appeals shows that, while engaging and effective in creating a relatable viewing experience, may not have conveyed the same level of seriousness or urgency. Humor can enhance viewer engagement and message retention, but it may also dilute the perceived gravity of the health message (30). The lower usefulness rating for the humorous appeal suggests that while it succeeded in capturing attention and making the content enjoyable, it might not have communicated the critical importance of oral cancer as effectively as the rational and fear-based appeals.

These findings underscore the importance of balancing emotional engagement with the seriousness of the message in health communication efforts. Integrating these approaches suggests that health communication strategies must be tailored to both the audience's preferences and the desired outcome. A balanced approach that combines emotional engagement with factual content is crucial for achieving meaningful behaviour change. Effective health promotion materials should leverage humour to engage audiences while also providing clear, factual information to raise awareness and prompt action (34, 36). This dual approach can maximize the impact of health messages, ensuring they are both engaging and informative.

The limitations of the study include potential variability in participant perceptions over time and the influence of the viewing context. Despite these limitation, the study's strengths lie in its RCT design, which enhances the reliability and validity of the findings by minimizing bias and allowing for causal inferences regarding the

impact of different social marketing appeals. Moreover, the inclusion of a diverse sample, particularly with a balanced gender distribution, further strengthens the generalizability of the results. Future research should take these factors into account and employ mixed method approaches to provide a more comprehensive understanding of user responses and acceptance of digital oral health promotion.

Overall, selecting appropriate presentation styles is crucial for enhancing audience engagement and promoting effective health communication.

CONCLUSION

The study found that all three video appeals (rational, humorous, and fear-based) were well received in the context of digital oral health promotion for oral cancer awareness, demonstrating strong audience engagement across various dimensions such as social interaction, informativeness, and perceived usefulness. Humorous appeals were most effective in promoting social interaction and presentation style, while fear-based appeals were rated highest for educating viewers about oral cancer. Rational appeals, however, received lower ratings, particularly in terms of presentation style and effectiveness.

These findings highlight the need for a balanced approach in digital oral health promotion, where emotional engagement (such as humour) is integrated with factual content to raise awareness and encourage proactive health behaviours. Tailoring communication strategies to audience preferences is crucial for maximizing impact and motivating individuals to take action in preventing oral cancer.

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