Compendium of Oral Science

Marketing Match: How Sociodemographics Influence User Acceptance of Social Marketing Appeals in Oral Health Promotion

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ABSTRACT

Objective: This study aimed to evaluate how sociodemographic factors influence user acceptance of different social marketing appeals.

Materials and Methods: This study was designed as a three-armed randomised controlled trial, with the non-emotional (rational) appeal serving as the control group. We utilised an adapted, translated, and validated modified Technology Acceptance Model (TAM) questionnaire consisting of 23 items on a five-point Likert scale to assess user acceptance. Participants were randomly assigned to watch one of three intervention videos on oral cancer, each featuring a distinct appeal: rational (Video 1), humour (Video 2), and fear-based messaging (Video 3).

Results: A total of 322 participants viewed videos featuring rational (34.0%), humour (33.0%), and fear (33.0%) appeals. Gender distribution was 51.2% male and 48.8% female, with age groups comprising 34.2% in early adulthood, 33.8% in middle adulthood, and 32.0% in the elderly. Educational levels were evenly split between high school or below and tertiary education or higher, each at 50.0%. Overall, participants exhibited positive acceptance across all demographics for the videos, with no significant differences in gender,

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age, education level, smoking status, or marital status (p > 0.05). However, age demonstrated a significant relationship with user acceptance of humour appeal (p = 0.006), with mean scores ranging from 4.26 to 4.62.

Conclusions: The study revealed that most sociodemographic factors do not significantly impact the overall acceptance of social marketing videos, with age being a notable exception, suggesting the potential for generalised social marketing campaigns. Future research could explore how different demographic variables influence user acceptance in diverse health promotion media.

1. INTRODUCTION

Social marketing (SM), which applies commercial marketing strategies to promote positive behavioural changes for societal benefit, has emerged as an essential tool in addressing various public issues, from health promotion to environmental sustainability (Andreasen, 2018). In the realm of digital oral health promotion (OHP), particularly for oral health, social marketing provides a powerful platform to influence health behaviours on a large scale through online campaigns and multimedia content. With the rise of digital communication, oral health campaigns can now reach a broader audience more efficiently, making the design of these campaigns even more critical (Leventhal et al., 2016).

One of the primary challenges in digital social marketing is crafting appeals that resonate with diverse audience segments, particularly as digital campaigns target a broad population. Sociodemographic factors such as age, gender, and educational background could significantly influence how individuals respond to different marketing strategies, including those employed in digital health promotion (Lee & Kotler, 2011). For example, younger adults may respond more favourably to humor or interactive digital content, while older adults may prefer straightforward, rational messaging (Stanley & Turner, 2021). These factors are crucial in shaping the acceptance, engagement, and overall effectiveness of oral health campaigns, especially in the digital space, where content must appeal to a wide array of users.

Understanding how these sociodemographic variables drive the acceptance and effectiveness of different marketing appeals is essential for optimising campaign design and ensuring equitable access and engagement across diverse populations. Tailoring digital oral health promotion strategies to accommodate these differences can significantly enhance the ability to promote behaviour change and improve public health outcomes (Wakefield et al., 2010). As such, social marketing strategies in the digital age must be increasingly adaptive to ensure they meet the needs of all demographic groups, helping to reduce health disparities and improve overall community well-being (Ruiter et al., 2014).

Previous studies have emphasised that social marketing campaigns cannot adopt a "one-size-fits-all" approach (Andreasen, 2018; Lee & Kotler, 2011). Rather, they must be tailored to align with the values, beliefs, and preferences of various demographic groups (Andreasen, 2002). For example, older individuals may respond more positively to health-related campaigns that emphasise long-term benefits, whereas younger audiences might be more influenced by appeals that highlight social norms or peer behaviours (Peattie & Peattie, 2009). Similarly, socioeconomic status often dictates the level of receptiveness to environmental initiatives, with higher-income individuals more likely to adopt

sustainable practices, compared to lower-income groups who might prioritise immediate financial concerns (Gordon et al., 2011).

Furthermore, cultural context significantly influences how social marketing messages are perceived and acted upon. Research has shown that collectivist societies, which prioritise group harmony and interdependence, respond better to appeals that emphasise community benefits, while individualistic societies tend to favour campaigns that highlight personal responsibility and autonomy (Yan, 2022). By aligning social marketing efforts with the sociodemographic realities of target audiences, marketers can enhance the relevance and persuasiveness of their campaigns, leading to more effective behaviour change.

While previous studies have highlighted the importance of tailoring social marketing campaigns to align with the sociodemographic characteristics of target audiences, limited research has explored how specific types of appeals such as rational, humorous, or fear-based messaging impact the acceptance of digital oral health promotion campaigns among diverse groups.This gap underscores the need for a nuanced exploration of appeal strategies to better engage target groups and address disparities in health awareness and behaviour change.

Thus, the objective of this study was to evaluate sociodemographic factors that influence the user acceptance of different social marketing appeals in oral health promotion. Specifically, we seek to understand the interplay between demographic characteristics and various appeal strategies for health promotion, such as emotional, and non-emotional (humour and fear) appeals. By analysing this relationship, we provide insights for healthcare providers, marketers and policymakers on how to design more inclusive and effective social marketing campaigns that cater to the diverse needs of society.

2.   MATERIALS AND METHODS

2.1   Ethical Approval

The study received ethical approval from the UiTM Research Ethics Committee REC/04/2022 (PG/MR/80).

2.2   Study setting and design

It was a three-arm randomised controlled trial (RCT) conducted from April 2022 to January 2024 at the Urban Transformation Centre (UTC) in Selangor. One arm was set to be the control group which was non-emotional (rational) appeal.

2.3   Study samples and instruments

The sample size was calculated using the G*Power 3.1.9.7 Sample Size Calculator, which is particularly suitable for analysing multiple groups. A significance level of 0.05 and a power of 0.95 were established for the analysis. Additionally, to accommodate a 30% anticipated dropout rate, a total of 328 participants needed to be recruited across three arms, with each arm comprising approximately 109 to 110 participants.

The study included participants aged 18 and older who attended UTC Anggerik Mall and understood Malay language, as the intervention videos were produced in Malaysia's national language. Participants were selected using systematic sampling based on even waiting numbers. They were then divided into twelve subgroups, which were established based on age, gender, and education level using

stratified random sampling (Figure 1), ensuring balanced representation across demographic groups. This was a single-blind trial in which participants were unaware of which video they would be assigned to watch. The assignment process involved concealing group allocations by folding the papers twice and placing them in twelve separate plastic containers, each representing a subgroup, from which participants randomly selected their group.
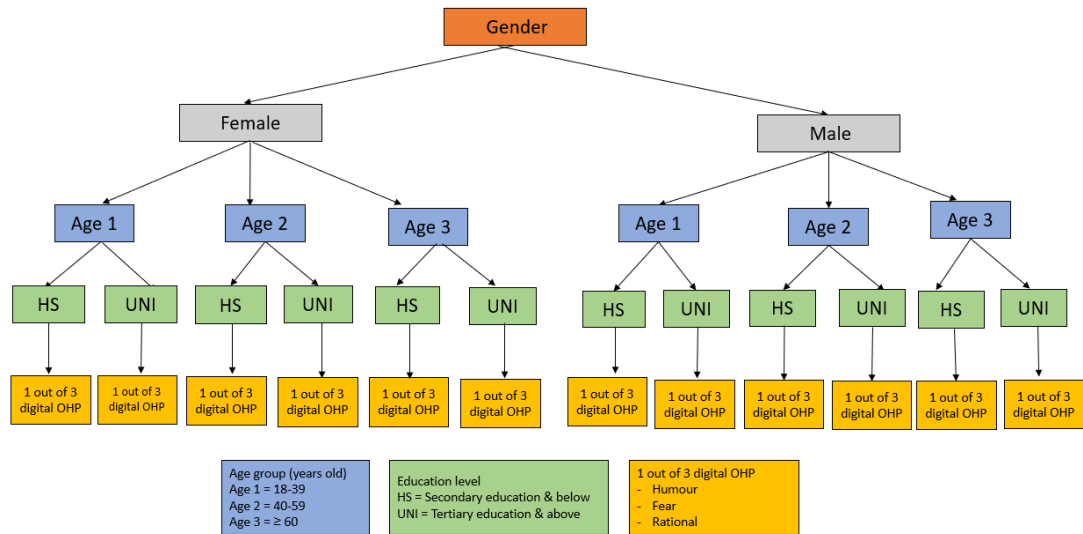

Fig.1 Stratified random sampling based on gender, age and educational level

For study instruments, a modified extended Technology Acceptance Model (TAM) questionnaire, comprising 23 items on a five-point Likert scale, was adapted, translated, and validated to evaluate user acceptance.

Participants were randomly assigned to view one of three intervention videos, all of which presented the same information on oral cancer but employed different appeals. Video 1 used a rational appeal, Video 2 featured a humor appeal, and Video 3 incorporated fear-based messaging (Figure 2). The topic of oral cancer was chosen because its content can be effectively presented using three different appeals, providing a suitable framework for comparative analysis. Subsequently, participants completed the hardcopy questionnaires immediately after viewing the intervention video.

Video 1 : Rational appeal

Video 2 : Humour appeal
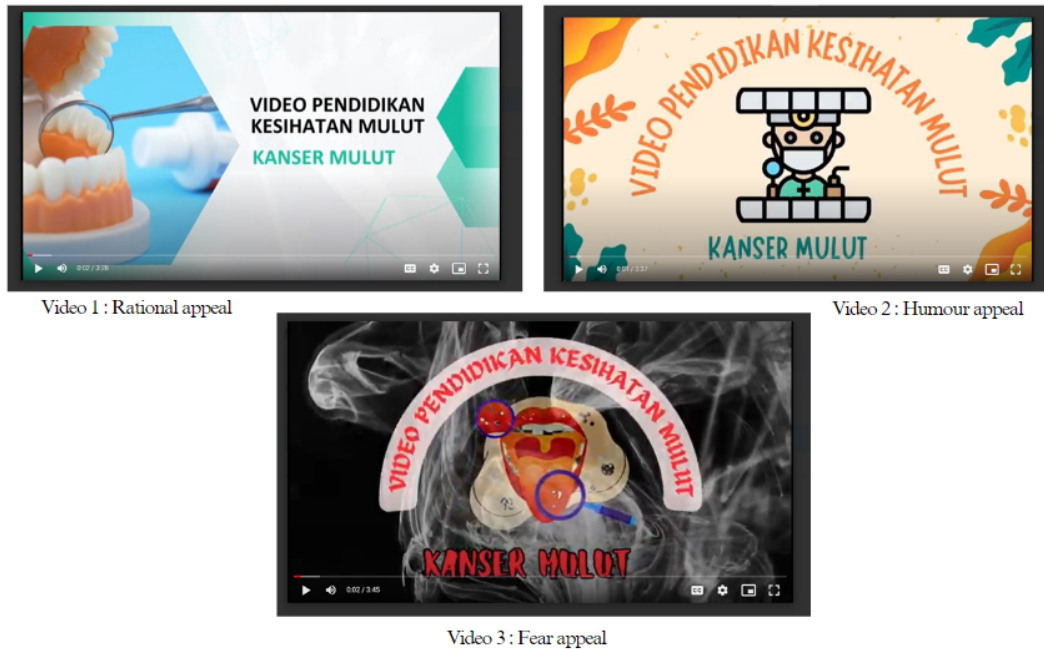

Video 3 : Fear appeal

Fig.2 Three intervention videos on oral cancer incorporating distinct appeals

2.4   Statistical analysis

Data collection involved surveys administered to participants using standardised instruments, with responses recorded manually for assessments. The data was then entered into a digital database using Microsoft Excel® 365® and subsequently transferred to IBM SPSS Version 29.0 through double-entry verification to minimise errors. Variables were appropriately labelled and formatted for analysis. Data analysis included descriptive and inferential statistics such as one-way ANOVA and two-way ANOVA were conducted.

3.   RESULT

The study achieved a response rate of 98.0%, with a total of 322 participants distributed across the three intervention groups: rational appeal (34.0%), humour appeal (33.0%), and fear-based appeal (33.0%). Gender distribution was 51.2% male and 48.8% female, with age groups comprising 34.2% in early adulthood, 33.8% in middle adulthood, and 32.0% in the elderly. Educational levels were evenly split between high school or below and tertiary education or higher, each at 50.0%. Further demographic data were summarised in Table 1.

Table 1. Total Respondents' Sociodemographic Characteristics by Number and Percentage (N=322)

Sociodemographic	Number (%)
Gender	
• Male	165(51.2)
• Female	157(48.8)
Age grouping	
• Early adulthood (18-39 years old)	110(34.2)
• Middle adulthood (40-59 years old)	109(33.8)
• Elderly (≥ 60 years old)	103(32.0)
Educational level	
• High school level & below	161(50.0)
• Tertiary level (university/college)	161(50.0)
Marital status	
• Single	86(26.8)
• Married	213(66.1)
• Divorced	10(3.1)
• In a relationship	13(4.0)
Smoking status	
• Non-smoker	242(75.2)
• Smoker	46(14.2)
• Ex-smoker	34(10.6)

Overall, participants demonstrated consistent positive acceptance across all demographic categories for all appeal types of videos, with no significant differences in acceptance based on these factors. The mean acceptance scores were uniformly positive where age (4.20–4.62), gender (4.31–4.46), education level (4.31–4.48), smoking status (4.12–4.46), and marital status (3.87–4.55), as presented in Table 2.

Table 2. The Influence of Sociodemographic Factors on User Acceptance towards Three Different SM Appeals

Appeal (Video)	User Acceptance			p-value
	Mean (SD)			
Sociodemographic profiles	Rational appeal	Humour appeal	Fear appeal	
Age				
• Early adulthood (18-39 years old)	4.38(0.42)	4.62(0.43)	4.49(0.40)	
• Middle adulthood (40-59 years old)	4.38(0.37)	4.38(0.48)	4.37(0.49)	0.458
• Elderly (≥ 60 years old)	4.20(0.39)	4.26(0.53)	4.31(0.39)	
Gender				
• Female	4.31(0.40)	4.37(0.52)	4.33(0.44)	0.674
• Male	4.33(0.41)	4.46(0.47)	4.45(0.42)	
Education level				
• High school and below	4.34(0.43)	4.48(0.44)	4.40(0.44)	0.706
• Tertiary (university/college)	4.31(0.37)	4.37(0.54)	4.39(0.43)	

Appeal (Video)	User Acceptance			p-value
	Mean (SD)			
Sociodemographic profiles	**Rational appeal**	**Humour appeal**	**Fear appeal**	
Smoking status (NHIS)				
• Non- smoker	4.34(0.38)	4.46(0.50)	4.40(0.44)	
• Smoker	4.35(0.43)	4.42(0.45)	4.38(0.36)	0.708
• Ex-smoker	4.23(0.45)	4.12(0.45)	4.33(0.50)	
Marital status				
• Single	4.35(0.45)	4.55(0.43)	4.43(0.42)	
• Married	4.34(0.38)	4.41(0.50)	4.38(0.45)	0.582
• Divorced	4.33(0.35)	3.87(0.80)	4.30(0.32)	
• In a relationship	4.04(0.25)	4.13(0.30)	4.34(0.49)	

Further multiple comparisons were conducted to assess user acceptance of each appeal in relation to sociodemographic profiles. No significant differences were observed for rational, and fear appeals across the sociodemographic factors. However, statistical analysis did reveal a significant relationship between humour appeal and age ($p = 0.006$) where early adulthood exhibited the highest mean acceptance.as shown in Table 3.

Table 3. The Influence of Sociodemographic Factors on User Acceptance towards Humour Appeal in SM for OHP

Sociodemographic profiles	**User Acceptance**	**p-value**
	Mean (SD)	
Age		
• Early adulthood (18-39 years old)	4.62(0.43)	
• Middle adulthood (40-59 years old)	4.38(0.48)	0.006
• Elderly (≥ 60 years old)	4.26(0.53)	
Gender		
• Female	4.37(0.52)	0.273
• Male	4.46(0.47)	
Education level		
• High school and below	4.48(0.44)	
• Tertiary (university/college)	4.37(0.54)	0.268
Smoking status (NHIS)		
• Non- smoker	4.46(0.50)	
• Smoker	4.42(0.45)	0.102
• Ex-smoker	4.12(0.45)	

Sociodemographic profiles	User Acceptance	p-value
	Mean (SD)	
Marital status		
• Single	4.55(0.43)	
• Married	4.41(0.50)	0.083
• Divorced	3.87(0.80)	
• In a relationship	4.13(0.30)	

Additionally, post hoc analysis (Table 4) confirmed a significant difference in acceptance of humour appeal (Video 2) between these two age groups (p = 0.005).

Table 4. POST HOC Analysis between Age Groupings

Multiple Comparisons
Dependent Variable: mean_useracceptance
Tukey HSD

(I) age_grouping	(J) age_grouping	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
early adulthood	middle adulthood	.24034	.11267	.088	-.0276	.5082
	elderly	.36605*	.11347	.005	.0962	.6358
middle adulthood	early adulthood	-.24034	.11267	.088	-.5082	.0276
	elderly	.12571	.11347	.511	-.1441	.3955
elderly	early adulthood	-.36605*	.11347	.005	-.6358	-.0962
	middle adulthood	-.12571	.11347	.511	-.3955	.1441

*. The mean difference is significant at the 0.05 level.

4.   DISCUSSION

To the best of our knowledge, this is the first three-armed randomised controlled trial to analyse the relationship of sociodemographic profiles against different types of appeals in social marketing for digital OHP. These results highlight the importance of tailoring social marketing strategies to fit the unique preferences of different demographic groups, particularly when using humour appeal.

The significant difference in humour acceptance between younger and older adults suggests that humour is not universally effective. Younger adults, who demonstrated the highest acceptance scores, may respond more positively to humour due to their cognitive flexibility, media consumption habits, and active engagement with humour-based content. Our findings align with previous research that suggests younger individuals often utilise humour for social bonding and identity formation, making it a compelling tool for shaping their attitudes and behaviours (Stanley & Turner, 2021). Additionally, contemporary studies emphasise the role of humour in fostering connections and enhancing engagement among younger audiences in various contexts (Banas et al., 2011).

Conversely, older adults exhibited lower acceptance of humour appeals, likely due to differences in cognitive processing and media preferences. Our findings are consistent with research

indicating that as individuals age, they tend to favour simpler and more direct forms of humour, as complex or fast-paced humour can be cognitively taxing (Greengross, 2013). Additionally, this aligns with studies showing that cognitive aging influences humour processing, prompting older adults to prefer straightforward humour that requires less cognitive effort. For instance, one study highlighted that older adults typically favour humour that relies on familiar themes and straightforward wordplay, as their cognitive processing speed and working memory may decline with age (Daniluk & Borkowska, 2017).

These age-related preferences suggest that social marketing campaigns utilising humour should be tailored to enhance accessibility and engagement for older audiences (Gonot-Schoupinsky & Garip, 2018). By simplifying humour or incorporating universally relatable themes, such as shared experiences or common life stages, campaigns can improve their effectiveness across diverse age groups. Our findings support the notion that integrating elements that resonate with older adults' life experiences such as health, family, or nostalgia can further boost engagement.

Moreover, using humour that aligns with the values and perspectives of older adults can foster a sense of connection and relatability, thereby enhancing the messaging's impact. For example, incorporating familiar cultural references or everyday scenarios can help bridge generational gaps, ensuring the intended message is effectively communicated. This reinforces the importance of a nuanced approach when designing humour-based content, taking into account the cognitive and emotional preferences of older adults to maximise engagement and promote positive health behaviours (Harm et al., 2014).

On the other hand, our findings align with previous research indicating that rational and fear appeals enjoy broad acceptance across various sociodemographic factors, including age, gender, education, smoking status, and marital status. This consistency suggests that such appeals address fundamental human concerns such as health, safety, and well-being that resonate universally (Hornik et al., 2017). Rational appeals, in particular, leverage logical arguments and factual information, providing clear and actionable insights that are relevant to a diverse audience. For instance, health campaigns that highlight the benefits of a smoke-free lifestyle or emphasise the importance of vaccinations effectively engage individuals by tapping into shared concerns about health and longevity (Lee & Kotler, 2011). The lack of significant differences across demographic groups indicates that rational content can be effectively utilised on a broad scale (Zhang et al., 2014) minimising the need for extensive customisation in campaign design.

Similarly, fear appeal, which emphasise the potential risks and consequences of harmful behaviours, seem to transcend demographic differences by tapping into a universal emotional response to perceived threats. Fear is a primal emotion that triggers a protective response, making fear-based messages effective across diverse audiences (Witte & Allen, 2000). Since fear appeals often aim to increase perceived susceptibility to risks and the severity of consequences, they are likely to resonate across various groups, as everyone can relate to the desire to avoid harm (Ruiter et al., 2014). The consistent acceptance of fear-based content suggests that these appeals can be used effectively in broad-based social marketing campaigns, without needing to tailor the message to specific sociodemographic characteristics.

In summary, while humour appeal requires careful tailoring to suit different age groups, particularly older adults, rational and fear appeals offer a more generalised approach to social marketing. Their broad resonance across diverse demographic categories means that campaigns using these strategies can achieve widespread acceptance without significant modifications. This adaptability enables healthcare providers and social marketers to design more efficient and cost-effective digital

campaigns that can effectively reach a wide audience, ultimately promoting positive behavioural outcomes in oral health awareness and practices.

STRENGTHS AND LIMITATION

This study's strengths lie in the RCT design, which enhances both the reliability and validity of the findings by reducing bias and enabling causal inferences between different social marketing appeals (Hariton & Locascio, 2018). Additionally, the sociodemographic characteristics of the participants, particularly the balanced gender distribution, reflect the Malaysian population, thus increasing the generalisability of the results (DOSM, 2024).

However, as a limitation, the single exposure to the intervention videos captures only immediate responses, without accounting for the cumulative effects of repeated exposure over time, limiting insights into how acceptance may evolve.

Nonetheless, the findings highlight the need to tailor digital health promotion strategies to different demographic groups when using rational, fear, or humour-based appeals. Future research should consider longitudinal designs with multiple video exposures to better understand how user acceptance of social marketing messages develops over time, refining strategies for broader, long-term effectiveness.

6.   CONCLUSION

The findings of the study substantiate those sociodemographic factors, including gender, age, and education level, do not significantly impact user acceptance of social marketing appeals. However, the data reveal that age plays a crucial role in the effectiveness of humor-based appeals, with younger adults demonstrating a higher level of acceptance compared to older individuals. This highlights the importance of age-specific considerations when designing humour-driven campaigns, while rational and fear-based appeals can be more universally applied across different demographic groups. Therefore, it is recommended that future research delve deeper into how various demographic variables influence user acceptance across diverse health promotion media.

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AUTHORS' CONTRIBUTIONS
Conceptualisation: RNA, BAS and NMM; Data curation: RNA; Formal analysis: RNA and BAS; Investigation: RNA; Methodology: RNA, BAS and NMM; Project administration: RNA; Supervision: BAS, NMM and HR; Writing original draft: RNA; Writing, review & editing: BAS, NMM and HR. All authors have read and agreed to the published version of the manuscript.

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CONFLICT OF INTEREST

The authors also declare no conflicts of interest related to this work.

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7. APPENDIX

A. About the Authors

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