

Using Social Marketing to Optimise Media Channels for Healthcare Public Service Advertisements (PSAs): Exposure, Attention, and Accessibility Among Adults.

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ABSTRACT

Purpose – To investigate the extent to which type of media used affects the efficiency of health-focused PSAs by applying social marketing principles and evaluating exposure, attention and accessibility as three main factors influencing consumer engagement.

Research Design/Methodology- An explorative study was completed using a mixed methodology that included both quantitative and qualitative methods. Quantitative data were collected from a cross-section of 278 adults through the use of a survey questionnaire supplemented by qualitative data collected through semi-structured interviews with 20 participants. Statistical data analysis for the quantitative data included ANOVA and multiple regression, and thematic analysis for the qualitative data to achieve a greater understanding of the pattern of consumer engagement.

Findings - The analysis indicated that digital media performed better, particularly with respect to consumer attention. It was also found that consumer socio-demographics had a significant impact on both exposure and attention, with gender showing the strongest relationship with attention. Qualitative data provided insight into how consumer engagement was affected by their media habits, perceived credibility and presentation of the ads and how accessibility was a factor across all media channels.

Practical Implications – These results suggest that an integrated media strategy that combines both digital and traditional channels will be effective as well as create segmentation strategies to target audiences based on their media use and access.

Originality/Value – This study developed an integrated framework that included all three components of engagement, thereby providing empirical support for improving the selection of media channels to use within health communication campaigns.

Keywords: Social marketing; Healthcare; Public service advertisements; Media channels; Attention; Exposure; Accessibility; Healthcare communication...

INTRODUCTION

Governments and health organizations commonly use advertisements to inform the public about the importance of health and to try to influence people's health-related behaviours (Kanchan and Gaidhane, 2024; Smile Foundation India, 2025). The principles behind international health communication include the concept that using an integrated approach will provide the best opportunity for reaching and influencing your target audience with public service advertisement messages in the community (Task Force on Community Preventive Services, 2010; The Compass for SBC, 2022). For example, the Compass for SBC states how different media

platforms provide great opportunities to reach all different groups of people with information contained in PSAs (The Compass for SBC, 2022). PSAs can be delivered through a wide variety of means, including television, radio, newspapers, internet sites, and social media. As consumers continue to splinter their consumption of media into many different types and sources, the challenge many organizations face is knowing which type(s) of media will provide the best opportunity to attract the attention of, and deliver their PSA message to, adult audiences.

The recent trends show a move to providing health communication that is more consumer focused and multi-platform, especially within developing countries like

India. However, many public service advertising campaigns are still utilizing uniform strategies, which could cause some groups of people to be overwhelmed by the messages as well as others not reach at all (Maurya and Kumar, 2024; Elareshi et al., 2024). As there has been an increase in movement toward data driven insights about how to choose between media channels during this transition, there is a lack of empirical evidence regarding the comparative effectiveness of these different channels in delivering the key outcomes of exposure, attention and access. Therefore, practitioners do not have clear information on how to align their media strategies with their audience(s).

Social marketing provides an alternative way to resolve this problem by leveraging commercial marketing strategies to advocate for social causes. Social marketers utilize their knowledge and experience regarding consumers to identify targets, evaluate desired behaviours and plan campaigns (French and Blair Stevens, 2007; Evans, 2006). Public health professionals and marketers have identified best practice benchmarks for conducting audience (target) research to select the right channels and increase the success of campaigns. Likewise, health communication frameworks have identified the importance of matching media selection to target audience attributes (OLCreate, 2020; The Compass for SBC, 2022). However, research evaluating how social marketing principles influence media selection for PSA campaigns is limited. Historically speaking, PSA campaigns have not consistently used consumer-centred techniques which has resulted in insufficient evaluations of their successes (Cooper et al., 2014, 2015).

This study attempts to address this gap in knowledge by applying the principles of social marketing to analyse the influence of the various media selected to increase the effectiveness of health-focused PSAs. The study measures participant engagement by looking at three factors; exposure, attention and accessibility. These factors measure participant engagement and therefore will allow us to understand the need for more comprehensive methods of measuring how effective media are for health communication (OLCreate, 2020). The study compares the level of engagement experienced by users across television, radio, print, web and social media based on survey data and socio demographic factors of the users. The analytical framework of the study draws together the various factors into one structure, which assists with providing an improved understanding of how various media channels perform and provide valuable insight into improving PSA strategies.

To address these gaps, this study adopts a social marketing perspective to examine how media channel selection and socio-demographic characteristics jointly influence PSA effectiveness among adults. Specifically, the study aims to (1) compare the effectiveness of different media channels in attracting attention to healthcare public service advertisements and (2) analyse the influence of socio-demographic characteristics on exposure and attention across media channels. By integrating exposure, attention and accessibility within a unified framework, this study contributes to a more

nuanced understanding of media optimisation in healthcare social marketing.

Literature Review

Social Marketing Foundations and Media Strategy

Social marketing gives a clear and structured route to planning and measuring health communication efforts for voluntary behaviour change. It has a very strong focus on understanding your audience and researching different segments of the target population, then tailoring strategies to meet the many needs and situations found in each group (French and Blair Stevens 2007). In the context of health and healthcare communication, this approach is imperative to maximise effectiveness of public service advertisements fixed across multiple media platforms. The selection of a media channel is a strategic factor that directly impacts the overall effectiveness of a specific campaign. Evans (2006) notes that successful campaigns revolve around aligning the media channels used with the characteristics of the audience; however, many campaigns still follow uniform strategies. Several systematic reviews show that no single communication strategy will consistently work for all audiences (Ceretti et al., 2022). Rather, the effectiveness of communication strategies is dependent upon how well the chosen channels are congruent with the audience's habits and access to the media, thereby highlighting the necessity of understanding the complexities of effective media strategies.

Healthcare PSA Effectiveness: Exposure and Attention as Distinct Constructs

PSAs related to health care are generally evaluated based on awareness or behavioural change, however, new research shows that distinguishing between exposure and attention to a message is critical. Exposure refers to whether or not someone encountered the message, while attention represents the amount of cognitive processing you used for that message. Studies show that there is no guarantee for someone to change their behaviour based on simply being exposed to the message. For example, in their work, Brown & Basil (1995) show that exposure will influence the outcome indirectly (i.e., through increases in knowledge and involvement); and that based on the work of Cantrell et al. (2022), exposure will lead to better recognition but not improved engagement with a message. At this time, attention has not been consistently defined and is typically measured as recall, which may not adequately reflect the actual amount of cognitive processing someone used. For example, while some studies consider attention as an outcome of exposure, others link attention to how well a message was designed or what context it was presented in (ex. setting). The ambiguity regarding exposure and attention makes it difficult to evaluate the effectiveness of PSAs and suggests the need for additional research to develop clearer communication models through differentiating between exposure and attention.

Media Channel Optimisation and Differential Effects

As the world of health communications continues to evolve with advancements in digital media, how consumers access and receive health-related messaging

has also changed dramatically. Traditional media such as television, radio, and print remain viable in terms of their total reach and established credibility; however, the rise of digital platforms allows for much more interactive and engaging forms of communication with consumers. Recently, researchers have turned their attention to the comparison of how well these different media perform. For example, according to Allom et al. (2018), "digital platforms generally result in more significant engagement levels than do traditional media." However, evidence shows that traditional media continues to be critical in creating awareness, which implies that both can work well together and provide value to the consumer. And yet, there are many instances where traditional media perform as well as digital types. For instance, Ceretti et al. (2022) note, "the nature of the platform used, as well as the characteristics of the audience, are both influential in determining the results of a communication." Furthermore, the results of studies examining channels of communication in isolation fail to deliver a comprehensive understanding of their collective impact, even though preliminary work suggests that developing integrated approaches may be beneficial.

Accessibility of Health Information Across Media Channels

Accessibility is a critical aspect of health communications that lacks sufficient examination. Exposure and engagement focus on how long an audience sees or reads a specific piece of information through delivery methods; however, the concept of accessibility considers whether individuals are able to acquire and use information from one type of media to another (i.e. from traditional to digital). Digital media platforms increase accessibility by offering users access to information on demand, as well as giving users flexibility in the way they use information; thus, encouraging a communications model based around the user. However, access is not equal due to variations in the availability of the Internet, variations in the level of digital literacy, and differences in socio-economic status (SES) among groups. As noted in Allom et al. (2018), while online health campaigns may generate a high level of user engagement, they may not reach all audiences due to accessibility issues. Traditional forms of media, such as television and radio, typically provide greater access because they tend to have a wider reach than digital media. Accessibility is, therefore, determined by both social conditions and technology; in spite of its significance, it is still under-researched; integrating accessibility into research will provide additional insight into the impact of communication on health.

Socio-Demographic Determinants of Exposure and Attention

Demographic and social background influence an individual's media consumption as well as their reactions to health communications. Different exposures occur between different demographic groups based on age, gender, education level, and the geographic location of residence of the individual. An individual who is younger generally uses and accesses digital media more than an individual who is older, as older individuals tend not to have the same access to and level of familiarity with these

channels. The educational background of an individual helps determine his or her capacity to interpret health-related information. The greater the education level, the greater the amount of engagement with health communications. An individual in an urban area generally will have greater access to electronic media than one in a rural area, who relies on more traditional forms. Although these variables are critical in communications, they are usually included in the analysis as control variables. Communication effectiveness will be enhanced for diverse populations when a greater emphasis is placed on segmentation in order to provide targeted strategies to improve effectiveness through diverse groups within the population.

Hypothesis Development

This study analyses the impact of media channel selection and audience characteristics on healthcare public service announcements from a social marketing perspective. To accomplish this goal, two specific objectives are defined. The first objective is to compare the effectiveness of different media channels in attracting adults' attention to healthcare public Service advertisements within a social marketing framework. Among media channels, it appears that digital channels are more likely to produce engaged audiences than traditional channels due to the ability of digital channels to allow interactivity, personalization and on-demand access; therefore, the Elaboration Likelihood Model and Interactive Media Engagement Theory state that interactivity supports greater processing and sustained attention.

The second objective is To Analyse socio demographic characteristics influencing exposure to and attention toward healthcare public service advertisements across media channels, informing social marketing campaign optimisation, the way in which an individual interacts with various media channels may depend upon their sociodemographic; thus, there would be significant differences between the levels of attention and exposure amongst various demographic groups. The hypotheses are mentioned below:

H1: Digital media channels will attract greater attention to healthcare public service advertisements than traditional media channels.

H2: Socio-demographic characteristics will be positively associated with both exposure to and attention toward healthcare public service advertisements across media channels.

Theoretical Integration and Conceptual Framework

This study pulls together several different theoretical frameworks to thoroughly explain how well PSA works. Specifically, it utilizes hierarchy of effects model, elaboration likelihood model, and information exposure theory.

The hierarchy of effects model describes a sequential link between exposure and attention as the basis for both the first hypothesis (H1), and second hypothesis (H2). Attention is a measure of the cognitive depth at which a person is processing a message, while exposure represents the stage of communication where someone has simply viewed a media message.

The elaboration likelihood model builds on the concept of attention and provides a means of understanding how attention also determines how deeply an individual will engage with a message by processing the message through one of two routes (central or peripheral) based on the person's level of attention at the time the message was viewed (Slater, 1999). The characteristics of the media channel a message is delivered through serve as mediating variables in determining the conditions under which people pay attention, and therefore provide support for first hypothesis (H1).

Information exposure theory is based on the idea of selective exposure, which means that individuals select the media channels they want to view depending on their own personal preferences and needs (Donohew & Lorch, 1998). This theory offers a basis for testing the second hypothesis (H2) since socio demographic factors have an impact on how people select media channels and therefore how they are exposed to messages.

According to the theoretical underpinnings, the conceptual model places media as the main independent predictors affecting attention—this aligns with our first hypothesis (H1). Digital channels should produce greater amounts of attention due to their interactive capabilities. The second hypothesis (H2) posits that socio-demographic characteristics can serve as predictors of both exposure and attention.

Exposure has been perceived to be an antecedent to attention and accessibility to be a supporting factor for attention and exposure. Therefore, the combined model will analyse the two perspectives, exposure and attention, so that researchers can distinguish between these elements; additionally, the inclusion of both the accessibility variable and the relationship between organizational resources' (media channel) effect and socio-demographics within the social marketing discipline has not been previously addressed in the literature. Media channel, exposure, attention and accessibility have been incorporated into a unifying framework of social marketing in the form of Figure 1.

Conceptual Framework

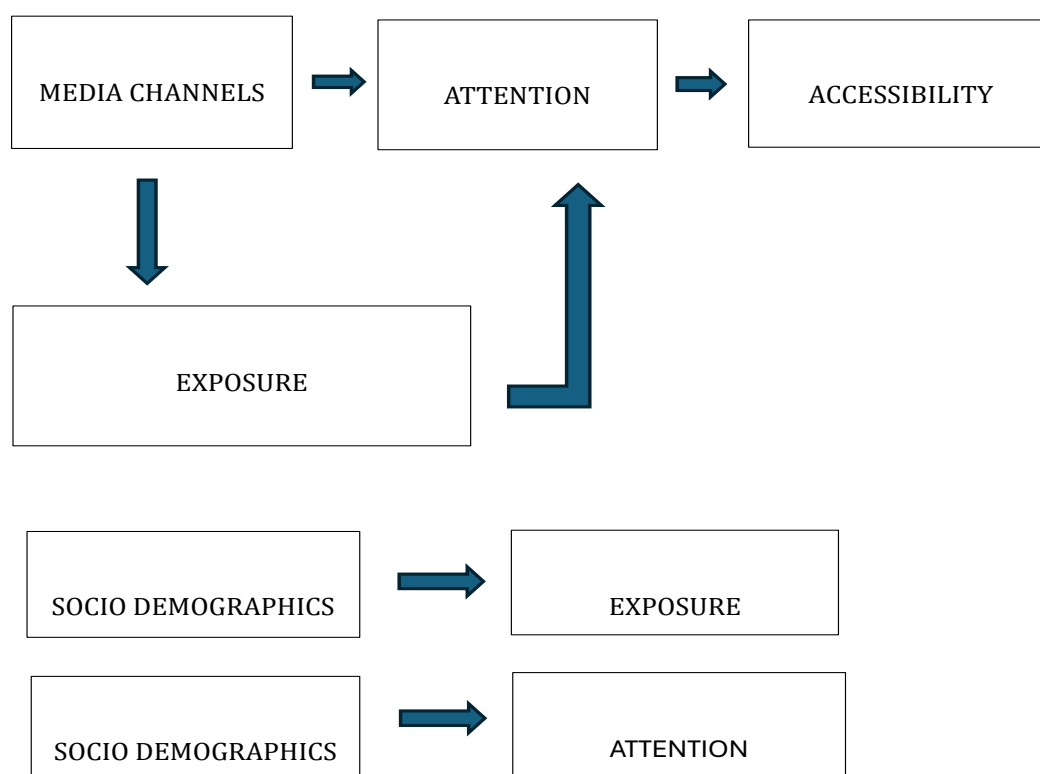


Fig. 1 - Conceptual framework of media channel optimisation for healthcare public service advertisements based on social marketing theory

Methods

A mixed-methods design was adopted, reflecting a social marketing perspective that foregrounds audience insight and channel segmentation, an approach widely used in health communication research to combine statistical analysis with contextual understanding (Allom et al., 2018; Brown & Basil, 1995). The study combined a quantitative survey of adults with qualitative interviews,

enabling both statistical testing and in-depth understanding of PSA engagement. The quantitative component utilised a cross-sectional online questionnaire, while the qualitative component involved follow-up interviews with selected respondents. Ethical approval was obtained from the institutional review board, and all participants provided informed consent.

Participants and Data Collection

A total of 278 adults (aged 18+) from Tripura (India) completed the survey. Participants were recruited using convenience sampling via social media and community networks. Four respondents did not report their place of residence, resulting in 274 valid responses for the

residence variable. Table 1 presents the distribution of respondents by residence. The survey link was shared online and began with an information sheet outlining the study's purpose, ensuring voluntary participation and anonymity. After removing incomplete responses, 278 cases were retained for statistical analyses. Because inferential analyses in SPSS use all available cases for variables included in each model, the regression and

ANOVA analyses were conducted on the full sample of 278 respondents. The dataset used in this study was originally collected as part of a broader investigation into media consumption and health communication. The current study represents a focused secondary analysis aligned with social marketing objectives, allowing for the examination of media-channel optimisation through existing validated measures. Such secondary analytical approaches are well-established in communication and marketing research for theory extension and model testing (Cugelman et al., 2011). Distribution of the respondents is illustrated by their places of residence (Table 1).

Table 1. Distribution of respondents by place of residence

Place of residence	Frequency	Percentage (%)
Urban	179	65.3
Rural	95	34.7

(Note. Percentages are calculated using valid responses (n = 274). Four respondents did not report residence information; the total survey sample was N = 278)

Data were collected via a structured, self-administered questionnaire. The survey included closed-ended items to measure media usage, PSA exposure, attention, and accessibility, as well as socio-demographics. A subset of participants (n=20) was later invited for semi-structured telephone interviews to explore their experiences and preferences in greater depth.

Measures

The survey consisted of multiple sections that measured various key variables. Respondents indicated how often they used television (TV), radio (radio), print, Internet media, and social media for obtaining health related information (the media measure), and a total media exposure score was created by aggregating the usage of these media, representing the total amount of exposure to public service announcements (PSAs). This measurement illustrates Theme 1, digital media's important role in daily engagement.

Respondents rated how much they noticed and remembered health advertisements from the media using a five-point scale (the level of attention). An average score was created for this section for the purpose of linking the results measured in this section to the themes related to message design and engagement.

Respondents rated how easy it was to obtain health information from the various media sources (the measure of access) by providing their answers for the various media sources (the measure of access). Many respondents expressed concern about the accessibility of health-related information and expressed further concern about the digital divide experienced by certain population segments as exemplified by demographic and socio-economic characteristics.

Various demographic characteristics (age, gender, education, and place of residence) were used to look for differences in response to the various audience segments

in relation to the themes on how demographic factors influence audience response.

All of these measures had good reliability as represented by reliability coefficients (Cronbach alpha) of 0.80 or greater. Overall, these measures provide a simple and unified method of assessing media behaviour, engagement and access, thus producing usable outcome measures in a format that is easily understood.

Data Analysis

Quantitative data was analysed using SPSS to provide standardised analysis for both trends and patterns. Summaries of sample characteristics were compiled using descriptive statistics including means, standard deviation and frequency distributions. One-way ANOVA was then used to test H1 by analysing attention levels over various media preference groups such as television, radio, print, and Internet/social media. Post hoc tests provided details on the specific differences among groups, and chi-square facilitated to determine the distribution of attention responses among the audience clusters. Since the analytic samples were characterised by present audience preference rather than controlled exposure, the resultant findings indicate varying distributions of audience preference segmentations rather than any direct cause/effect relations.

For H2, multiple regression analysis was performed to assess how age, gender, education and residence influenced exposure and attention among the audience. Two independent models were developed, one assessing the relationship between exposure and the other measuring the association between attention, and the results were analysed using standard statistical measures.

Qualitative data were analysed through thematic analysis, which produced similar themes in the quantitative analysis and, as such, contributed to explaining the quantitative results. Themes included the dominance of

digital media, people's daily routines, types of messaging, message credibility, trust signals, and accessibility.

Results

Sample Profile and PSA Engagement

The examined population consisted of 278 individuals age 18 or older ($M=34.2$ years of age). Of the population, 54% were females, and 46% were males; most respondents were from urban areas (65.3%, $N=179$), while the remaining respondents were from rural areas (34.7%, $n=95$), as presented in Table 1. The occurrence of respondents from both urban and rural areas establishes a fair representation of the entire population, allowing for the exploration of how various socio demographic characteristics impact PSA behaviours.

Respondents reported multiple media sources through which they had been exposed to health-based PSAs; with 80% accessing health-based PSAs weekly through television, while reported use of other types of media sources included 60% of respondents who accessed PSAs weekly via social media; 55% accessed PSAs weekly via

radio; and 40% accessed PSAs weekly through print media. The mean level of exposure (15.2) with a standard deviation (4.1) suggests that participants have experienced moderate levels of exposure overall.

Moderate engagement with health-based advertisements, resulting in a mean level of attention (3.4) with a standard deviation (0.8), suggests that the level of engagement among respondents varies, obtaining further evidence that there are significant differences among individuals regarding their level of attention to PSAs.

The results of the reliability analysis demonstrate strong evidence of internal consistency; Cronbach alpha values were (0.85) and (0.79) for both attention and exposure, respectively. Findings from the item level analysis do not appear to contain significant concerns and therefore, are acceptable in supporting the use of the constructs in subsequent statistical analyses. Sample characteristics for each respondent are either presented or collected from the group of respondents; this is presented within Table 2.

Table 2. Sample characteristics (N=278)

Characteristic	Category	Frequency	%
Gender	Male	126	46.0
	Female	148	54.0
Education	<Undergrad	142	51.8
	≥Undergrad	132	48.2
Residence	Urban	179	65.3
	Rural	95	34.7
Mean (SD): Age	—	34.2 (10.5)	—

(Note. Residence frequencies are based on valid responses ($n = 274$) due to four missing values.)

Media Channels and Attention (H1)

Hypothesis 1 predicted that digital media would receive more attention than traditional media for public service announcements related to health. The first step in testing this hypothesis was to categorize participants according to their preferred source of health-related information; this resulted in five categories of preferred sources consisting of respondents from television ($n = 80$), radio ($n = 48$), print ($n = 35$), internet ($n = 60$), and social media ($n = 51$). These categories represent a way for the audience to categorize their preferred media sources; however, they do not reflect the causal effect of exposure to the type of media source they prefer.

The analysis used an analysis of variance (ANOVA) to compare the means of the attention indices by media source. The analysis found a significant main effect, $F(4,$

$273) = 9.28, p < .001, \eta^2 = .12$ (see Table 2). This indicates that there are significant differences in the means of the attention indices for the different media sources.

The post hoc comparisons using the Tukey HSD indicated that individuals who used social media ($M = 3.80$) had significantly greater attention compared to those who watched television ($M = 3.20, p < .01$) or read print ($M = 3.00, p < .01$) for health-related public service announcements. Also, individuals who used the internet ($M = 3.60$) had significantly greater attention to health public service announcements than those who watched television ($p < .05$). There were no further significant comparisons between the means. Chi-square test results (Goodness-of-Fit) are presented in respect to data contained within Tables 2a.

Table 2a. ANOVA for Attention to PSAs by Preferred Channel (H1)

Source	SS	df	MS	F	p	η^2
Between groups	32.777	4	8.194	9.278	<.001	.12
Within groups	241.097	273	0.883			
Total	273.874	277				

These findings lend support to H1 and suggest that individuals drawn to digital media channels place a greater degree of attention on health-related public service announcements (PSAs). The size of that effect ($\eta^2 \approx .12$) indicates a moderate level of influence, which accounts for approximately 12% of variance in attention as a function of preferred media channel type. From a social marketing perspective, these results suggest that multi-channel PSA marketing campaigns may better facilitate recall or engagement by emphasising a digital platform. The increased attention to PSAs by individuals with a higher level of engagement in digital media environments underscores the need for alignments between the channel marketing strategy and the audience's media consumption habit.

It is also worth noting that, while the users who preferred digital media exhibited higher levels of attention, the TV and radio media-preferring participants still displayed moderate levels of attention to PSAs. Thus, it can be concluded that traditional media should not be completely disregarded by PSA campaign managers; rather, campaign managers need to strategically integrate multiple channels as part of their media strategy. For example, combining TV campaigns with online support will capitalise on the advantages of either reach (through television) or engagement (through online) media. Further support for these findings is provided by participant's comments (from in-depth interviews) made subsequent to the collection of quantitative data (Qualitative Themes). Chi-square test results (Goodness-of-Fit) are presented in respect to data contained within Tables 2b.

Table 2b. Chi-square goodness-of-fit test for attention to social media health advertisements (H1)

Response Category	Observed n	Expected n	Residual
Strongly Disagree (1)	9	55.6	-46.6
Disagree (2)	22	55.6	-33.6
Neutral (3)	60	55.6	4.4
Agree (4)	125	55.6	69.4
Strongly Agree (5)	62	55.6	6.4
Total	278		

[Note. χ^2 (4, N = 278) = 147.07, $p < .001$. Expected frequencies were equal across categories. No cells had expected counts less than 5, satisfying assumptions for the Chi-square test.]

To confirm the robustness of the results, a nonparametric Chi-square goodness-of-fit test was performed on the attention variable. The Chi-square test was used because the attention measure contains Likert-scale responses that are by nature ordinal and because parametric assumptions for ANOVA would not be fully met with the attention item. The results of the Chi-square test indicated a statistically significant distribution of responses (χ^2 (4) = 147.07, $p < .001$) that are heavily skewed toward high levels of agreement with attention to social media-based health advertisements. Thus, the results indicate that attention as a variable is significantly skewed toward high levels of agreement; however, the Chi-square test does not measure differences between the media preference groups as such and should be interpreted only as providing descriptive data in support of engagement levels across socio-demographic characteristics of participants, but not as an inferential test of whether there are significant differences based on these participant characteristics (i.e., age, gender, education and geographic region) between groups regarding the independent and dependent variables.

Socio-Demographics, PSA Exposure and Attention (H2)

Hypothesis 2 (H2) proposed that socio-demographic characteristics (i.e., age, gender, education level, live location) would be positively related to PSA exposure and attention levels across all media channels studied. Two multiple regression analyses were used to test H2, one model predicting exposure to PSA and second model predicting attention to PSA, with all independent variables entered simultaneously into each model.

Exposure Model (H2a)

In the first model, the dependent variable was the *composite Exposure* score. Predictors were age (in years), gender (0=male, 1=female), education level (0=<Undergrad, 1= $\geq$ Undergrad), and residence (0=rural, 1=urban). The model was significant: F (4,273) = 8.65, $p < .001$, with $R^2 = .113$. This indicates that approximately 11.3% of the variance in PSA exposure was explained by these demographics, representing a modest but meaningful level of explanatory power commonly observed in survey-based communication research. The relatively modest R^2 values are consistent with prior

research in media and communication studies, where individual-level psychological and contextual factors beyond demographics often account for substantial variance.

Table 3 displays the regression coefficients. Age had a small but significant negative effect ($\beta = -0.24, t = -2.20, p = 0.028$), indicating that younger respondents reported slightly higher exposure. Gender was significant ($\beta = -0.31, t = -5.15, p < 0.001$): males had higher exposure scores than females. Residence was a significant predictor ($\beta = -0.137, p = .018$), indicating that

respondents from rural areas reported higher exposure compared to urban respondents. Finally, higher education was positively related ($\beta = 0.22, t = 3.50, p < 0.001$). All four predictors contributed uniquely (no multicollinearity issues were detected).

Although the model explains a relatively modest proportion of variance, this level of explanatory power is typical for demographic predictors in media and health communication research.

Table 3. Regression Predicting PSA Exposure (H2a)

Predictor	B	SE	β	t	p
Age	-0.043	0.019	-0.132	-2.262	.024
Gender	-1.410	0.353	-0.230	-3.995	<.001
Residence	-1.018	0.429	-0.137	-2.375	.018
Education	1.467	0.478	0.179	3.068	.002

Some of the results support H2. A negative correlation between age indicates that younger people generally reported greater exposure to PSAs than older populations, possibly due to the younger generation using more media (e.g., online). Higher levels of exposure for men may reflect differences between men and women with respect to the manner in which they seek out information or consume media. Finally, those with higher levels of education had more PSA exposure than those with lower levels of education. Higher education may also be related to higher levels of attention to health-oriented content, and/or the ability to access more media.

The finding that urban residents have experienced more exposure to PSAs makes sense because urban areas tend to have more media available and PSAs are distributed more often in cities.

From a social marketing perspective, the model illustrates that different demographic segments (age, gender, residence) have very different baseline levels of exposure to health PSAs and therefore need to be considered when planning campaigns. For example, because rural and older populations are less likely to have been exposed to PSAs, interventions (e.g., local radio) will need to be implemented in those areas in order to reach the rural population. Conversely, the younger, urban, highly educated male populations most likely have had exposure to the PSAs via the channels that they prefer to use (e.g., social media, internet).

Attention Model (H2b)

A second regression analysis addressed the hypothesis of H2b using the same predictor variables with an Attention Index as the outcome. The model was statistically significant ($F(4,273) = 10.79, p < 0.001$) with an R^2 value of .137 (Adjusted $R^2 = .124$). This indicates only a small amount of variance in attention could be explained by the model. As with past research in media and communication studies, the relatively low R^2 values here indicate the many psychological and contextual factors important at the individual level that are not related to demographics account for a significant amount of variance in attention. Although demographics, particularly gender, were statistically significant to attention, a large proportion of the variability in attention could not be explained. Therefore, it is likely that other variables, not related to demographic characteristics (such as message design, media context and psychological engagement) could be more important than demographics in predicting attention to PSAs.

Only one of the predictor variables was found to be statistically significant in predicting attention to PSAs: gender. Males had higher attention scores than females ($\beta = -0.35; t = -6.10; p < 0.001$). Once gender was included in the model, age, education, and residence were not statistically significant. Therefore, a significant amount of the variance in attention is explained only by male gender (see Table 4).

Table 4. Regression Predicting PSA Attention (H2b)

Predictor	B	SE B	β	t	p
Age	-0.004	0.006	-0.06	-0.67	0.502
Gender (female=1)	-0.431	0.071	-0.35	-6.10	<.001
Education	0.102	0.084	0.07	1.21	0.227
Residence (urban)	0.095	0.096	0.06	0.99	0.322

(Note. Model statistics: $F(4,273) = 10.79$, $p < .001$, $R^2 = .137$, Adjusted $R^2 = .124$.)

From a statistical standpoint, the only predictor to exhibit significance in this study was gender—no demographic characteristic other than those related to sex strongly affected how much adult’s paid attention to PSAs (Public Service Announcements) once they became aware of such messaging. Male respondents tended to have higher levels of attention compared to females and this may be due to their greater media literacy or interest in health-related messages or possibly their greater "exposure" (as previously mentioned in the literature). The absence of a statistically significant age effect (in relation to exposure) indicates that age alone will not predict how much attention a respondent will pay to a PSA following being exposed to that same PSA. Furthermore, educational attainment and geographic location—all demographic-related characteristics—did not demonstrate a significant correlation with attention paid to PSAs, indicating that these factors were tied to levels of exposure rather than attention.

Together, the regression analyses conducted in this study support the conclusion that sociodemographic provide partial explanatory power for both reach and/or engagement with Public Service Announcements. Therefore, H2 (the hypothesis posited in this research study) receives partial empirical support; namely that individuals' gender and geographic location/urbanicity may be statistically significant predictors of who is exposed to PSAs, as well as statistically significant predictors of the level of attention received once exposed to the PSA, but other demographic-related variables played less of a role than did gender and urbanicity. Thus, the conclusion can be drawn that differences in sociodemographic segmentation should be factored into the design of PSAs as it relates to how “who” the target audience is may impact both how the message is distributed (reach) and how much they engage with the message (attention).

Qualitative Themes and Integration

The findings were expanded upon using thematic analysis of interview data. Interview data produced 7 themes that signify the way adults view health PSAs, and interact with them:

Sovereignty of Digital Media and Health Content’s Integration into Digital Life: Participants stated that they use social media and internet content more than any other form of media in their daily lives and often see health messages when viewing (i.e., “I see those ads all the time on Facebook”). Because Digital Preferred (DP) participants have far more opportunities to see health

content, they will have higher levels of attention and exposure (H1).

Attention-Driven Economy & Daily Habit Patterns: Respondents indicated that they receive many stimuli throughout each day and desire to have convenience. For example, respondents indicated their willingness to have attention when there is a need (e.g., “I only pay attention when it pops or I am looking for a health information”). The inability to disengage from one offer/activity to focus on health PSAs replicates the finding from regression analysis of younger urban adults (H2a) who receive more exposure to PSAs due to the multiple online tasks they are completing.

Various interviewees indicated emotional or visually based PSAs (e.g., videos and infographics) would be more

memorable: For instance, one individual stated: "the ones with catchy music and/or shocking images stay in my mind." Therefore, data support the premise that content characteristics can enhance attention (not merely exposure). The quantitative data also show that males reported higher attention levels, and many males indicated in the interviews that dynamic content aligns well with their media consumption habits, indicating content type may have demographic influences.

Participants indicated throughout interviews that although social media can be heavily used for advertising: it is often full of misleading information. Several participants indicated that traditional media (TV and newspapers) generally feel more credible ("I trust something I see on a news channel more than I do on YouTube"). Thus, while the results from this study indicated greater attention to digital media, credibility still plays an important role in determining effectiveness. As a result, urbanization was found to have a significant impact on exposure but not necessarily on attention when examining regression results.

Building Trust through Authority Signals: A common theme across all interviews was that reputable signals, like logos and endorsements, enhance impact. Participants stated that by seeing a logo or trusted NGO logo it gave credibility to the information being communicated. This was true across different mediums, whether it's a TV PSA or a Facebook PSA. The presence of a clear source name helped sustain participants' attention in those cases. This information also provides rationale for using a known entity in the design of PSAs, in addition to the choice of medium.

The Effectiveness of Message Design: Through the interviews that we conducted, simple, actionable messages were the most effective. One attendee was comparing two advertisements: one that they found "very confusing", and another with a tagline – "Eat Healthy!" – that they remembered. This again demonstrates how design affects final attention/recall of messages. It suggests that the amount of attention given to a message may also be contingent on how clearly the message is constructed. While not included in our quantitative modelling, attendees' comments suggest that in order to optimise engagement, social marketers must address the content of their messages along with the channels used to deliver them.

Digital Divide and Hybrid Media Strategies: Several interviewed individuals shared that some groups (i.e., older people or people from the countryside) are less engaged with some types of digital media than others. For instance, one rural person said, "I don't really use smartphones; they'll send you ads via the radio". This statement again confirmed the earlier leading to findings that rural residents have lower overall engagement with the advertisement. Therefore, reaching these segments of the population may be more effective by using a combination of channels; for example, combining radio with digital channel (social media).

The findings reveal a strong relationship between qualitative and quantitative data, leading to high levels of confidence in the conclusions drawn. The first theme from the qualitative research supports the quantitative finding that digital channels lead to increased levels of attention through the assertion that digital media dominate one's everyday life. The credibility and trust themes illustrate the value of traditional media as providing an increasing level of engagement for some participants and provide a compliment to the use of digital channels. The themes associated with age and geographic location highlight the fact that younger urban participants experience a greater degree of exposure than older and rural audience segments, who rely more on traditional media.

The second theme, as well as the seventh theme both identify daily habits and types of access as having an impact on exposure patterns. Themes three through six provide more specific insights as to how message development including design, emotional impact, signals of credibility and clarity impact on improving attention. Collectively, the final findings suggest that in order to be successful, PSAs need to be developed around proper channel selection and content of interest to targeted audiences.

ANOVA and regression analysis provide statistical support for the findings and are consistent with the qualitative data collected. The finding that media selection, audience segmentation and message development act in concert to improve the success of PSAs validates that multiple methods of measuring results can provide reliable information to understand the effectiveness of communication efforts and assist in optimizing media strategies within the area of social marketing.

Discussion

Interpretation of Findings

This research demonstrates how critical selecting media channels can be in creating successful health public service advertisements and how the media environment and characteristics of the audience affect how the intended message is conveyed through all three areas of exposure, attention, and accessibility. The research shows that digital media (through the use of interactivity, immediacy, and user controls) create more attention than traditional means, and therefore provide increased levels of cognitive involvement. While the number of exposures creates greater levels of attention, it is not just a matter of frequency of exposure. That is, the characteristics associated with the selected media channels (e.g., time of day, types of media) create different levels of attention received by the audience. The socio-demographic make-up of an audience creates some restrictions on exposure to PSAs; however, they create fewer restrictions on levels of attention received. Therefore, the effectiveness of PSAs varies greatly among different types of audiences due to how actively audiences are involved with the media channels (preferences, access, and social norms) versus passively receiving the intended messages. The context within which the media was used and the socio-demographic make-up of the audience will influence how effective PSAs are within a multi-stage engagement process across multiple media channels. Access to media and the level of digital and print literacy greatly restrict those from engaging with the media when the media channels represent unequal access to content.

Theoretical Implications

This research extends social marketing theory and health communication through three unique avenues. The first is that it expands on the hierarchy of effects model and shows how a viewer's transition from exposure to attention is not an automatic occurrence, but accomplished through the interaction of media channel characteristics; thus, to interpret engagement as occurring linearly from one activity to another we must also account for contextual or environmental conditions associated with a person's environment when determining how they are engaged.

Second, the result of this research confirms (with empirical data) parts of the elaboration likelihood model, i.e., a digital media environment enables greater cognitive processing of the message, due to the higher level of attention, thus suggesting a higher probability that processing will occur via the central route. Conversely, traditional forms of media are primarily conducive to peripheral route processing due to their relatively passive characteristic; hence, the study supports an existing theoretical framework regarding how various media environments will impact message processing.

Third, this research expands on the idea of information exposure theory based on how different socio-demographic characteristics shape people's ability to access and use various types of media channels. That is, individuals engage with different types of media channels based on their preferences, what they have access to, and any other contextual constraints in order to stay true to themselves. This underscores the need to include the

differences among audiences when developing theoretical models of communication effectiveness.

In addition to this, the research adds to previous frameworks of communication effectiveness that have primarily focused on the constructs of exposure and engagement by incorporating an analysis of accessibility into their conceptualization. By viewing accessibility as an element that influences both the exposure and attention given to a PSA, the researchers provide a broader conceptualization of the effectiveness of PSAs from a social marketing perspective.

Practical Implications

This research has some useful lessons for social marketers and policymakers. The authors suggest that attention should be viewed as an important indicator of how effective a communication effort is, and that campaign design should create engagement with audiences, mainly through interactive digital platforms. In addition, differences between audience segments in terms of their socio demographic characteristics affect the campaign outcomes, and therefore segmentation of audiences should account for media habits, access, and media preferences. Relying on one media type may not be sufficient; using both digital and traditional channels creates greater reach and engagement. Digital channels provide interaction and easy access, while traditional channels create a perception of credibility and reach. Access issues should be taken into account, in terms of digital literacy and infrastructure, to ensure that campaigns are equally accessible for all individuals. Overall, this research reinforces the need to use established theories and evidence-based methods when developing public service communication strategies that provide targeted and effective service delivery.

Methodological Implications

This research contributes to social marketing method by using both qualitative (i.e. contextual) and quantitative (i.e. statistic evaluative) data to evaluate the effectiveness of public service announcements (PSAs). This paper's results show that self-report measures of attention or exposure to a PSA may not reflect actual attention or exposure, which indicates the need to use additional objective methods (i.e. digital analytical tools) and experimental design in future research studies to increase the accuracy of measured PSA effectiveness. Additionally, results of this study support the segmentation of audiences for evaluating the media effectiveness; however, such segmentation will make it more challenging to establish causal relationships, thus future studies should focus on creating an appropriate balance between the real-world relevance and strong causal inference in their research designs.

Conclusion

The present study offers a theoretical foundation, as well as empirical evidence support, for an understanding of the effectiveness of public service announcements (PSAs) for healthcare within the context of social marketing. By combining exposure, attention and access, this research shows that the effectiveness of communication is determined by not only the ability to reach an audience but

also the ability to engage the audience in particular media environments.

Digital media were determined to have a greater role than traditional media (e.g., television) in generating attention. However, traditional media were noted to still provide significant reach and credibility. The influence of demographic characteristics on communication strategies reinforces the need for audience segmentation and context-sensitive approaches to communication.

In accordance with these findings from previous research into PSAs, we would like to emphasize that we have developed more comprehensive and nuanced theories concerning the ways in which PSAs function within our daily lives, through the combination of quantitative evidence with qualitative data from audience members' experiences with PSAs. Additionally, we have provided practical considerations in designing health communications so they will aid in (1) capturing the attention of individuals; (2) creating a means by which individuals can connect with the message; and (3) creating a healthy population.

Limitations and Future Research

The study does have limitations, as all studies do, (1) Use of a cross-sectional design limits the ability to determine causality, (2) Because of the use of convenience sampling, generalizability of findings to populations outside of the

study neither supported nor refuted ; (3) Self – reported media use is an indicator of what participants perceived to be their exposure to media campaign; therefore, self-report may not accurately represent actual exposure to campaign materials; (4) Attention and accessibility may be subject to either positive or negative bias in response; (5) Accessibility has primarily been assessed through perception(eg, participant reported)which fails assess some structural characteristics (e.g., digital infrastructure, digital literacy) that may affect accessibility ; (6) Future studies should consider longitudinal or experimental design, utilize objective measures of exposure, and gather more varied data. (7) Future studies should develop multidimensional measures of access and investigate different cultural contexts and media efficacy.

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