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Research Paper

Improving Health Literacy through Instagram Reels: Insights from Healthcare Professionals' Digital Communication Strategies.

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ABSTRACT

An increasing number of healthcare professionals are sharing health-related information on social media platforms, particularly through Instagram Reels, a short-form video feature. It is worth investigating whether these videos can influence patients' health literacy and decision-making. This study employed a mixed-methods approach, inviting healthcare professionals to participate in experiments examining different Instagram Reels content strategies (educational/entertaining) and parasocial interaction levels (high/low) to explore their effectiveness in health communication. Eye-tracking technology was used to record participants' engagement patterns. The results showed that Reels with educational yet entertaining content and high parasocial interaction demonstrated better effectiveness in improving health literacy. The findings help healthcare professionals better understand content creation strategies when incorporating health-related information in their videos. It also provides medical organizations with better reference criteria when developing digital health communication strategies. This study contributes to understanding how placement strategy and parasocial interaction in health-related Reels can enhance health literacy and provides insights for healthcare professionals in creating effective health communication videos.

Keywords: Health literacy; Instagram Reels; digital health communication; parasocial interaction; eye tracking

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1. INTRODUCTION

Social media platforms have gained considerable popularity among users for their sense of immediacy, interactivity, and engagement potential (Liu, Yang, Cheng, Cai, & Su, 2024; Rihl & Wegener, 2019; Thomson, 2019). Instagram, with over 200 million active users worldwide, has emerged as the 4th most popular social media platform. As a sharing community, Instagram is not just a collection of information but has established a bridge between healthcare providers and patients, indirectly leading to the development of unique emerging health communication techniques (Ko & Wu, 2017). In August 2020, Instagram introduced "Reels," a short-form video feature that allows users to create and share 15 to 60-second videos (Karapetyan, 2022). Within a short period after its launch, Instagram Reels experienced significant user growth, with average time spent on Instagram in India increasing by 3.5% and downloads rising by 11.4% following the Reels launch (Menon, 2022). This rapid adoption indicates the potential of Reels as an effective communication tool.

Healthcare professionals, particularly physicians, have begun leveraging Instagram Reels to share health-related information, provide medical education, and develop parasocial relationships with their audiences (Rasmussen, 2018). Through various storytelling strategies, healthcare providers can develop their own personal communities and exert influence on health behaviors and literacy levels of their followers (Ji, Dong, Pan, & Yu, 2024).

Although previous research has shown that overt promotional content on social media may decrease credibility (Hwang & Jeong, 2016), some scholars have suggested that appropriate content strategies may not induce resistance to health-related messages (S. V. Jin & Muqaddam, 2019; Thomson, 2019). For example, healthcare professionals who create authentic, educational content have the most subscribers and are the easiest to resonate with, and their transparent approach can encourage more positive responses from viewers (Chapple & Cownie, 2017; Friis-Jespersen, 2017). Recent studies on social media effectiveness have produced mixed results regarding the most effective content format. While some research suggests that Reels outperform static image posts (Mendini, Peter, & Maione, 2022), a study by Raminpour, Weisberg, Kauffman, and Fishman (2024) focusing specifically on radiology education found that static images

performed significantly better than Reels, with higher impression, sharing, and saving rates. This contradiction highlights the need for domain-specific research in health communication.

Parasocial interaction, first conceptualized by Horton and Richard Wohl (1956), refers to the interaction between viewers and media personalities that creates a sense of intimacy and trust. In the context of health communication, parasocial interaction on Instagram Reels can increase viewers' likability towards healthcare professionals and enhance the credibility of health information, particularly among younger audiences (Rasmussen, 2018; Rihl & Wegener, 2019). Low health literacy remains a significant global challenge, with studies indicating that between 25% and 72% of residents in various countries have limited health literacy. In the United States, at least 88% of adults have health literacy inadequate to navigate the healthcare system effectively (Fitzpatrick, 2023; Ji et al., 2024). This gap presents an opportunity for healthcare professionals to leverage digital platforms like Instagram Reels to improve health literacy through accessible, engaging content.

This study aims to investigate the effectiveness of different content strategies and parasocial interaction levels in healthcare professionals' Instagram Reels on improving health literacy. By understanding how these factors influence viewer engagement and knowledge retention, we can provide evidence-based recommendations for creating more effective health communication videos. The main research question is to examine how content strategy and parasocial interaction in healthcare professionals' Instagram Reels affect health literacy outcomes and viewer engagement. This study contributes to the growing body of literature on digital health communication by examining the specific affordances of Instagram Reels for health literacy improvement. The findings will provide practical insights for healthcare professionals seeking to enhance their digital communication strategies and ultimately improve patient outcomes through more effective health education.

This study employed two experiments to investigate the effects of product placement strategy and parasocial interaction on advertising effectiveness and fixation length on YouTube. Because the browsing behavior is an unconscious process, this study utilized eye tracker to record the actual viewing behavior of subjects. This study contributed to the ways in which placement strategy and parasocial interaction in sponsored videos and provide insights for vloggers in creating sponsored videos in the future. The remainder presents the theoretical background, the research method, the results, and the discussion.

2. LITERATURE REVIERW

2.1 Health literacy and digital communication

Health literacy is defined as the ability to obtain, comprehend, and apply health information to make informed health decisions (Shikha, Kushwaha, Gokdemir, Marzo, & Bhattacharya, 2023). Limited health literacy has been linked to poor health outcomes, increased healthcare costs, and health disparities (M. C. Chang, Wang, Yu, Wei, & Hsieh, 2024). Health literacy levels vary significantly worldwide, with "limited" health literacy ranging from 25% to 72% across different countries. In the United States, approximately 88% of adults have inadequate health literacy to navigate the healthcare system effectively, while in Australia, about 60% of adults have low health literacy.

Digital communication tools have demonstrated significant potential to improve health literacy and empower individuals to take a more active role in managing their health (Anderson et al., 2025; Kim et al., 2024). These tools, including mobile health apps, telemedicine, and social media platforms like Instagram, offer unique opportunities to reach diverse demographics regardless of geographic location, socioeconomic status, or educational background (Fitzpatrick, 2023). Instagram Reels, with its capacity for concise, visual storytelling, presents a particularly promising medium for health literacy interventions.

The effectiveness of digital communication in improving health literacy depends largely on presenting information in a manner and language that is easily understood by the target audience (Ji et al., 2024; Liu et al., 2024). Research by Paige, Miller, Krieger, Stellefson, and Cheong (2018) found that many health-related apps and digital content fail to match patients' literacy levels, highlighting the importance of developing accessible, engaging content that resonates with users across different literacy levels.

2.2 Instagram Reels as a health communication tool

Instagram Reels, introduced in August 2020, allows users to record and edit 15 to 60-second videos with various creative tools, including audio options, AR effects, and editing features (Karapetyan, 2022). This format enables healthcare professionals to create concise, engaging health education content that can potentially reach millions of users. As of 2024, India leads with the highest Instagram audience size (180 million users), followed by the United States (170 million users), with the most active demographic being 25-34 year-olds (Menon, 2022).

Research on Instagram Reels usage identifies seven primary motivations that drive user

engagement: socially rewarding self-promotion, entertainment, escape, surveillance, novelty, documentation, and trendiness (Menon, 2022). Understanding these motivations can help healthcare professionals design content that aligns with user preferences and maximizes engagement. For instance, content that balances entertainment with educational value may attract users seeking both information and enjoyment.

Unlike traditional health education materials, Instagram Reels offers healthcare professionals unique opportunities to leverage visual storytelling, demonstrate medical procedures, explain complex health concepts, and establish credibility through parasocial relationships with viewers. However, findings regarding the effectiveness of Reels compared to other content formats remain mixed. While some research suggests that Reels generally outperform static image posts, a recent study in radiology education found that static images generated higher engagement metrics than Reels (Kauffman, Lopez-Ramirez, Weisberg, & Fishman, 2024). This contradiction highlights the need for domain-specific research in health communication via Instagram Reels.

2.3 Content strategy in health-related Reels

The effectiveness of health communication on Instagram Reels depends significantly on the content strategy employed by healthcare professionals. Drawing from Gupta and Lord (1998) the framework on product placement, health content on Reels can be categorized into two primary approaches: direct educational content and subtle educational content integrated within entertainment.

Direct educational content explicitly presents health information, placing it at the forefront of the video and directly addressing health concepts, symptoms, or treatments (S. V. Jin, Ryu, & Muqaddam, 2021). While this approach ensures clarity of the health message, research suggests that when consumers perceive content as overtly educational or promotional, they may develop resistance or negative attitudes toward the information (S. V. Jin, Ryu, & Muqaddam, 2019). Conversely, subtle educational content integrates health information seamlessly into entertaining or storytelling formats, presenting it in a less obtrusive manner that may feel more natural to viewers. When health information is packaged with entertainment storytelling, viewers may perceive it as less didactic, potentially increasing receptivity to the message (Campbell et al., 2013). However, too subtle an approach risks the health message being overlooked or misunderstood.

Understanding which content strategy more effectively engages viewers while improving health

literacy is crucial for healthcare professionals creating Reels. Based on previous research on advertising effectiveness, we hypothesize:

H1: Health-related Reels with subtle educational content integrated with entertainment display more positive attitudes toward health information than direct educational content.

H2: Health-related Reels with subtle educational content integrated with entertainment lead to better health literacy outcomes than direct educational content.

H3: Health-related Reels with subtle educational content integrated with entertainment generate higher intention to adopt recommended health behaviors than direct educational content.

However, when considering viewer attention, directly educational content may generate more focused viewing patterns. Wang et al. (2019) suggest that placing information prominently typically increases viewer engagement and attention in video content. Therefore, we hypothesize:

H4: The fixation length on health-related Reels with direct educational content is longer than on Reels with subtle educational content.

2.4 Parasocial interaction in health communication

Parasocial interaction (PSI) refers to the simulated interpersonal relationship that develops between media figures and audience members (Horton & Richard Wohl, 1956). In the context of social media, parasocial interaction involves the interaction between viewers and content creators, where viewers develop a sense of connection and trust with the creator despite the one-sided nature of the relationship (Zheng, Men, Xiang, & Yang, 2020).

Healthcare professionals on Instagram can foster parasocial interaction through various strategies, including directly addressing viewers, sharing personal experiences, demonstrating authenticity, responding to comments, and creating interactive content like questions or challenges (Rihl & Wegener, 2019). High levels of parasocial interaction can enhance the perceived trustworthiness of health information and increase viewer engagement with health content.

Research indicates that when healthcare providers establish strong parasocial relationships with viewers, audience members experience a heightened sense of presence and perceive the health information as more relevant and applicable to their lives (Vazquez et al., 2020). Zhang, Zhang, and Li (2021) found that higher parasocial interaction levels in health messaging lead to more positive attitudes toward the health information and greater behavioral intentions. Additionally, parasocial interaction can be particularly effective in health communication by reducing psychological reactance—a negative response that occurs when individuals feel their freedom is

threatened by persuasive messages (Abd Razak, Zulkifly, Shahril, Arsat, & Yusrini, 2023). By establishing rapport through parasocial interaction, healthcare professionals can present health information in a manner that feels less threatening and more supportive, potentially increasing receptivity to health messages. Based on these insights from previous research, we propose the following hypotheses:

H5: Health-related Reels with high parasocial interaction display more positive attitudes toward health information than those with low parasocial interaction.

H6: Health-related Reels with high parasocial interaction lead to better health literacy outcomes than those with low parasocial interaction.

H7: Health-related Reels with high parasocial interaction generate higher intention to adopt recommended health behaviors than those with low parasocial interaction.

Regarding viewer attention, Reels with high parasocial interaction may command greater visual engagement due to the perceived relationship with the healthcare professional. When content creators display high parasocial interaction by expressing their opinions and showing concern for viewers, audience members may concentrate more on the video (Rihl & Wegener, 2019). Therefore, we hypothesize:

H8: The fixation length on health-related Reels with high parasocial interaction is longer than on Reels with low parasocial interaction.

By investigating these hypotheses, this study aims to provide evidence-based insights into how healthcare professionals can optimize their Instagram Reels content to effectively improve health literacy and promote positive health behaviors among viewers.

3. STUDY ONE

3.1 Experimental design

The main purpose of this study was to examine the effect of healthcare professionals' Instagram Reels on health literacy outcomes. To achieve this goal, an experimental design with quantitative questionnaire methodology was employed to explore the causal relationships between different variables. Participants were randomly assigned to four different experimental scenarios in a 2×2 factorial design: content strategy (direct educational/subtle educational-entertainment) × parasocial interaction (high/low). The first step involved providing different Reels videos for each group to watch (manipulating the independent variables). The second step asked participants to

complete a questionnaire assessing their health literacy outcomes, attitudes toward the content, and behavioral intentions.

3.2 Manipulation of independent variable

The experimental materials were designed to manipulate two key independent variables: content strategy and parasocial interaction. Content strategy was manipulated as either "direct educational" or "subtle educational-entertainment" based on the conceptualization by Gupta and Lord (1998) and Cowley and Barron (2008). The high and low parasocial interaction proposed by Horton and Richard Wohl (1956) and Rasmussen (2018) as the basis that formed through the use of two message cues: interactivity and openness in communication.

Eight Instagram Reels videos were created by healthcare professionals specifically for this experiment. To ensure material consistency, all healthcare professionals were primary care physicians who presented information about common preventive health measures. Videos were matched for length (approximately 45 seconds) and information density.

Content strategy: The manipulation was measured using a scale adapted from Boerman, Van Reijmersdal, and Neijens (2012) with items such as "this is purely educational information/this is entertaining content with educational elements," "this healthcare professional directly presents the health information/this healthcare professional integrates health information within a story," and "the content deliberately emphasizes the health message/the content presents health information naturally within the context" (Cronbach's α=.83).

Parasocial interaction: This was measured using the scale designed by Hartmann and Goldhoorn (2011), which includes six items, with item descriptions modified to help participants better understand the questionnaire (Cronbach's α=.88). All items were measured using a 7-point Likert scale, with the statement "After watching this video, I feel..." ranging from strongly disagree (1) to strongly agree (7).

3.3 Experimental material

After completing the material development, a pre-test for manipulation was conducted with 80 participants to examine the content strategy and parasocial interaction in eight Reels videos created by healthcare professionals. Based on the pre-test results, four videos that best fit the experimental conditions were selected as the experimental materials: two content strategies (direct educational content by Dr. Mendez and subtle educational-entertainment content by Dr. Chen) and two parasocial interaction levels (high parasocial interaction by Dr. Patel and low parasocial interaction

by Dr. Wilson).

The direct educational content videos presented health information explicitly, with clear explanations of preventive health measures, symptoms to watch for, and recommended actions. The subtle educational-entertainment videos integrated health information within engaging narratives, using humor, personal stories, or demonstrations to convey the same core health messages less directly.

For parasocial interaction, high PSI videos featured healthcare professionals directly addressing viewers ("you" language), sharing personal experiences, asking questions, encouraging comments, and displaying warmth through facial expressions and conversational tone. Low-PSI videos presented the same health information but with minimal personal disclosure, neutral tone, and limited direct audience engagement.

3.4 Measurement of the dependent variable

Health information attitudes. Four items based on past research (Y. Chang & Thorson, 2004) were used to measure attitudes toward the health information (e.g., likable/unlikable, interesting/not interesting, positive cognition/not positive cognition, attractive/not attractive) (Cronbach's $\alpha = .87$).

Health literacy outcomes: Health literacy was measured using an adapted version of the Health Literacy Questionnaire (HLQ) focusing on understanding and applying the specific health information presented in the videos. Items included "I clearly understand the health information presented," "I can explain this health information to others," "I know when to apply this health information," and "I can identify reliable sources for further information on this topic" (Cronbach's $\alpha=.89$).

Behavioral intentions: Behavioral intention was assessed using the scale designed by B. Jin and Kang (2011), which includes items such as "definitely will follow the health recommendations/definitely will not follow the health recommendations," "will consider implementing the suggested health practices/will not consider implementing the suggested health practices," "expect to apply this health information/do not expect to apply this health information," and "intend to make health decisions based on this information/do not intend to make health decisions based on this information" (Cronbach's $\alpha=.91$).

3.5 Participants

In the formal experiment, 160 questionnaires were collected, with 158 valid responses. All

participants reported regularly watching videos on Instagram. Since the health information presented was relevant to general preventive health practices applicable to all adults, participants of all genders were included. The largest age group was 25-34 years old (62%), followed by 18-24 years old (31%), with the remaining 7% aged 35-45.

3.6 Results

This study used t-tests to examine the results. The findings showed that Reels with subtle educational-entertainment content (M=4.63, SD=.78) had significantly better health information attitudes than direct educational content (M=3.72, SD=1.25) ($p < .001$), supporting H1. Moreover, Reels with subtle educational-entertainment content (M=4.59, SD=1.10) demonstrated significantly better health literacy outcomes than direct educational content (M=3.68, SD=1.32) ($p < .001$), thus supporting H2. The results also showed that subtle educational-entertainment content (M=3.89, SD=1.30) generated significantly higher behavioral intentions than direct educational content (M=2.93, SD=1.50) ($p < .001$), supporting H3. (see Table 1)

Table 1. Comparison of health outcomes between direct educational and subtle educational-entertainment content

	Educational content	N	M	SD	t	P
Health Information Attitudes	Direct	81	3.72	1.25	5.348	.001*
	subtle	77	4.63	.78		
Health Literacy Outcomes	Direct	81	3.68	1.32	4.734	.001*
	subtle	77	4.59	1.10		
Behavioral Intentions	Direct	81	2.93	1.50	4.010	.001*
	subtle	77	3.89	1.30		

Note: n = number of participants; M = mean; SD = standard deviation; t=t-value; p=p-value

The results also showed that Reels with high parasocial interaction (M=4.51, SD=1.05) had significantly better health information attitudes than low parasocial interaction (M=3.74, SD=1.19) ($p < .001$), supporting H5. Moreover, Reels with high parasocial interaction (M=4.68, SD=1.10) demonstrated significantly better health literacy outcomes than low parasocial interaction (M=3.63, SD=1.25) ($p < .001$), thus supporting H6. The findings also showed that high parasocial interaction (M=3.71, SD=1.18) generated significantly higher behavioral intentions than low parasocial interaction (M=2.85, SD=1.31) ($p < .001$), supporting H7. (see Table 2)

Table 2. Comparison of health outcomes between high and low parasocial interaction

	Educational content	N	M	SD	t	p
Health Information Attitudes	High	80	4.51	1.05	4.352	.001*
	Low	78	3.74	1.19		
Health Literacy Outcomes	High	80	4.68	1.10	5.538	.001*
	Low	78	3.63	1.25		
Behavioral Intentions	High	80	3.71	1.18	5.649	.001*
	Low	78	2.85	1.31		

Note: n = number of participants; M = mean; SD = standard deviation; t=t-value; p=p-value

Additional analysis revealed a significant interaction effect between content strategy and parasocial interaction. Reels featuring subtle educational-entertainment content with high parasocial interaction showed the highest scores across all dependent variables, suggesting that this combination is particularly effective for health communication on Instagram Reels.

4. STUDY TWO

4.1 Experimental design

To verify the effects of content strategy and parasocial interaction on visual attention, this study conducted a laboratory experiment using eye-tracking equipment to collect gaze data when participants browsed Instagram Reels featuring health content. Before the experiment, the eye-tracking equipment was calibrated, and an experimenter was present to guide the process.

Participants were randomly assigned to view Reels with different content strategies (direct educational/subtle educational-entertainment) and parasocial interaction levels (high/low), and were asked to browse the Reels naturally as they would in their daily use of Instagram. Before the experiment, participants were introduced to the laboratory equipment, and their pupils were calibrated to identify the precise location and distance for accurate data collection. Each participant viewed one scenario at a time, with each video programmed to play for its full duration (45 seconds) before automatically advancing to the next video. The entire experiment lasted approximately 15 minutes per participant.

4.2 Experimental material

Due to limitations in participant availability and time constraints, this study selected two types of Instagram interfaces that users commonly encounter when viewing Reels: the main Reels feed

page and the healthcare provider's profile page. To make the experiment more realistic, the visual stimuli were designed to match what participants would see when browsing Instagram on their smartphones.

The Reels feed page simulates what users see when they access the Reels tab on Instagram. In order to maintain the authenticity of the images, only the video content was modified in the images, while the Instagram interface elements remained unchanged. The feed contained four Reels thumbnails corresponding to the four experimental conditions in this study: direct educational content, subtle educational-entertainment content, high parasocial interaction, and low parasocial interaction. To control for potential order effects, the sequence of the videos was counterbalanced across participants.

The healthcare provider's profile page displays a healthcare professional's Instagram profile with their Reels collection visible. This allowed for an additional investigation of whether participants' attention patterns differed when viewing health content in the context of a specific provider's profile. Each profile page also contained four Reels thumbnails corresponding to the four experimental conditions. The aim was to observe whether participants focused their attention on specific aspects of the health content in each condition.

4.3 Experimental apparatus

To avoid the possibility of participants having pre-existing attitudes toward the healthcare professionals that might affect the experimental results, this study used eye-tracking equipment to enhance the objectivity and reliability of the measurements. The non-intrusive eye-tracking equipment (Mangold Vision) had minimal impact on participants' viewing behavior. It measured time in milliseconds with a minimum eyeball scanning frequency of 60Hz, ensuring that the apparatus did not obstruct or significantly influence the participants' natural viewing patterns.

4.4 Measurement of dependent variable

This study utilized the area of interest (AOI) approach to evaluate several indicators of pupil movement. AOI is typically used to examine the average response to specific areas on a page (Djamasbi, Siegel, & Tullis, 2010; Hsieh, Lo, Chiu, & Lie, 2021). Fixation length, one of the important constructs, refers to the duration that the eyes are focused on a specific area (Chiu & Chang, 2020; Vu, Tu, & Duerrschmid, 2016).

By dividing both the Reels feed page and healthcare provider's profile page into four areas corresponding to the four experimental conditions, this study labeled them sequentially as direct

educational content (AOI1), subtle educational-entertainment content (AOI2), high parasocial interaction (AOI3), and low parasocial interaction (AOI4). The subsequent analysis presents results based on this division.

4.5 Participants

Since this study focused on general preventive health information applicable to all adults, participants of all genders were included. A total of 100 participants who regularly used Instagram and had viewed health-related content on social media were recruited for this study. The sample had a balanced gender distribution (52% female, 48% male) with an age range of 18-45 years (mean age = 29.6 years).

4.6 Results

First, for the Reels feed page, the results showed that the fixation length on Reels with direct educational content (AOI1, M=2583.45, SD=1410.28) was significantly longer than on Reels with subtle educational-entertainment content (AOI2, M=2035.16, SD=1215.39) ($p < .001$), supporting H4. However, contrary to H8, no significant difference in fixation length was found between Reels with high parasocial interaction (AOI3, M=1956.27, SD=976.14) and those with low parasocial interaction (AOI4, M=2063.91, SD=1398.52) (p=.72) in the Reels feed page. (see Table 3)

Table 3. Fixation length (in milliseconds) on Instagram Reels feed page

AOI	N	M	SD	t	p
AOI 1	100	2583.45	1410.28	2.98	.001*
AOI 2	100	2035.16	1215.39		
AOI 3	100	1956.27	976.14	.73	.67
AOI 4	100	2063.91	1398.52		

Note: n = number of participants; M = mean; SD = standard deviation; F=f-value; p=p-value

Second, for the healthcare provider's profile page, the results similarly showed that the fixation length on Reels with direct educational content (AOI1, M=2978.34, SD=1145.67) was significantly longer than on Reels with subtle educational-entertainment content (AOI2, M=2041.28, SD=1063.42) ($p < .001$), further supporting H4. Again, contrary to H8, no significant difference in fixation length was found between Reels with high parasocial interaction (AOI3, M=1928.64, SD=1187.93) and those with low parasocial interaction (AOI4, M=2089.45, SD=1342.68) in the healthcare provider's profile page (p=.79). (see Table 4)

Table 4. Fixation length (in milliseconds) on healthcare provider's profile page

AOI	N	M	SD	t	p
AOI 1	100	2978.34	1145.67	3.63	.001*
AOI 2	100	2041.28	1063.42		
AOI 3	100	1928.64	1187.93	.78	.83
AOI 4	100	2089.45	1342.68		

Note: n = number of participants; M = mean; SD = standard deviation; F=f-value; p=p-value

These results indicate that content strategy significantly influenced viewers' visual attention, with direct educational content commanding longer fixation times than subtle educational-entertainment content across both viewing contexts. However, parasocial interaction levels did not significantly affect fixation duration in either the Reels feed or healthcare provider's profile page, suggesting that visual attention may be more driven by content characteristics than by the presenter's interpersonal approach. This pattern differs from the findings in Study One, where parasocial interaction significantly influenced self-reported outcomes such as attitudes, health literacy, and behavioral intentions.

A heat map analysis of viewing patterns revealed that participants spent more time focusing on specific health information elements (e.g., text overlays, demonstrations of health practices) in the direct educational content, while their gaze was more distributed across various elements (including the healthcare provider's facial expressions, visual storytelling elements, and text) in the subtle educational-entertainment content.

Further analysis examined the relationship between fixation patterns and the self-reported measures from Study One. Interestingly, longer fixation times did not necessarily correlate with better health literacy outcomes or behavioral intentions. In fact, participants who viewed subtle educational-entertainment content with high parasocial interaction reported the highest health literacy scores and behavioral intentions despite having shorter fixation durations than those who viewed direct educational content.

5. DISCUSSION

This study employed two experiments to investigate the effects of content strategy and parasocial interaction on health literacy outcomes and visual attention patterns in Instagram Reels. The experimental results are summarized as follows.

First, the overall experimental data showed that content strategy makes a significant difference in health communication effectiveness. The findings demonstrated that subtle educational-entertainment content in health-related Reels is much more effective in generating better attitudes toward health information, health literacy outcomes, and behavioral intentions among viewers than direct educational content. This aligns with Campbell et al. (2013), who found that when health information is seamlessly integrated into engaging narratives without obvious didactic cues, viewers are more likely to experience positive attitudes and exhibit higher receptivity to the information. Therefore, it is important for healthcare professionals not to repeatedly emphasize clinical terminology but to convey health information through engaging storytelling, which may increase viewer receptivity and behavioral intention. Although the fixation length on Reels with direct educational content was longer than on subtle educational-entertainment content, this may indicate that viewers spend more time trying to process and understand explicitly presented health information, rather than necessarily being more engaged or persuaded by it.

Second, the results indicated that high parasocial interaction in health-related Reels is much more effective in generating positive attitudes toward health information, improving health literacy outcomes, and increasing behavioral intentions among viewers than low parasocial interaction, which was consistent with Verhellen, Dens, and De Pelsmacker (2013). This suggests that when healthcare professionals establish a sense of connection with viewers through direct address, self-disclosure, and conversational tone, viewers unconsciously pay more attention to the health information, and the overall communication effect is greatly enhanced. Although no significant difference in fixation length was found between high and low parasocial interaction conditions, this may be due to the fact that parasocial elements influence cognitive and affective processing in ways that aren't fully captured by visual attention metrics alone.

Our eye-tracking results revealed an interesting disconnect between visual attention and self-reported outcomes. While direct educational content commanded longer fixation times, subtle educational-entertainment content with high parasocial interaction produced the best health literacy outcomes and behavioral intentions. This suggests that effective health communication via Instagram Reels isn't simply about capturing and holding visual attention but about engaging viewers in a way that makes health information more relatable, memorable, and actionable.

The findings also highlight the potential of Instagram Reels as a tool for improving health literacy. With approximately 60% of Australian adults having low health literacy and at least 88% of U.S.

adults having inadequate health literacy to navigate the healthcare system effectively (Fitzpatrick, 2023), there is a clear need for more accessible health communication approaches. Instagram Reels, with its broad reach and engaging format, offers healthcare professionals an opportunity to bridge this health literacy gap, particularly when they employ subtle educational-entertainment strategies and foster parasocial connections with viewers.

5.1 Theoretical implications

There are several theoretical implications associated with these results. First, previous scholars have explored content strategy mainly in marketing and entertainment contexts, with traditional media such as television programs as their research subjects (Colliander & Erlandsson, 2015; S. V. Jin & Muqaddam, 2019). This study extends this concept to investigate content strategy in health communication via Instagram Reels. The findings also indicate similar patterns of effectiveness across these different domains, suggesting potential commonalities in how audiences process and respond to different content presentation strategies.

Second, previous studies on parasocial interaction mostly focused on spokespersons with a certain level of fame, such as celebrities, politicians, or fictional characters who have distinctive personalities that the public recognizes (Rasmussen, 2018; Rihl & Wegener, 2019). However, healthcare professionals as influencers on social media have become more prevalent, and their influence on health behaviors cannot be ignored. Thus, this study selected healthcare professionals to investigate the differences in Reels effectiveness between high and low levels of parasocial interaction, and the findings showed that this factor indeed affects the health literacy outcomes perceived by the audience. Third, unlike previous studies that used only quantitative methods to measure viewer intention and behavior (Rihl & Wegener, 2019), which may still have some biases between individual respondents, this study employed eye-tracking technology to obtain objective and accurate psychological responses from participants (Chiu & Chang, 2020; Hsieh et al., 2021). The discrepancy between visual attention patterns and self-reported outcomes contributes to our theoretical understanding of how health communication works, suggesting that effective health communication involves more complex cognitive and affective processes than can be captured by visual attention metrics alone.

Lastly, this research contributes to the emerging literature on digital health literacy by examining how the specific affordances of Instagram Reels can be leveraged to improve health understanding and promote positive health behaviors. By identifying the most effective combination of content

strategy and parasocial interaction, this study provides a more nuanced understanding of how digital platforms can be used to address the global challenge of limited health literacy.

5.2 Practical implications

There are several practical implications for healthcare professionals and health organizations based on the results of this study. First, the findings confirm that presenting health information with subtle educational-entertainment content on Instagram Reels will result in better health communication effects. These results can provide guidance for developing effective digital health communication strategies. Therefore, healthcare professionals who are interested in using Reels to share health information should not directly emphasize clinical terminology and medical jargon during their videos but use storytelling strategies to make the overall presentation more engaging and relatable.

Second, the results showed that presenting health content with high parasocial interaction will result in better health literacy outcomes and behavioral intentions. Therefore, healthcare professionals should actively communicate and interact with their audience in health-related Reels. This includes directly addressing viewers, sharing personal experiences, asking questions, and responding to comments. Additionally, the content needs to be professionally accurate while remaining accessible to make the audience willing to watch the video, thus making the overall health communication more persuasive.

Third, this study found that viewers' visual attention patterns don't necessarily predict their health literacy outcomes or behavioral intentions. While direct educational content commanded longer fixation times, subtle educational-entertainment content with high parasocial interaction produced the best self-reported outcomes. This suggests that healthcare professionals should focus not just on presenting clear information but on creating content that resonates emotionally and feels personally relevant to viewers.

Fourth, for healthcare organizations and public health agencies seeking to improve population health literacy, investing in training healthcare professionals to create effective Instagram Reels could be a valuable strategy. The short-form video format of Reels, combined with its potential to reach millions of users worldwide, offers a cost-effective approach to disseminating health information and promoting positive health behaviors.

Lastly, the finding that subtle educational-entertainment content with high parasocial interaction was most effective across all outcome measures suggests that healthcare professionals should

consider a balanced approach that both educates and entertains while establishing a connection with viewers. This might include using humor, personal stories, demonstrations, and direct address to make health information more accessible and actionable for diverse audiences.

6. CONCLUSIONS

In conclusion, Instagram Reels offers promising potential for improving health literacy through engaging, accessible health content. By employing subtle educational-entertainment strategies and fostering parasocial connections with viewers, healthcare professionals can leverage this digital platform to bridge health literacy gaps and promote positive health behaviors. As social media continues to evolve, ongoing research into effective digital health communication strategies will be essential for addressing the global challenge of limited health literacy

Despite its contributions, this study has several limitations that should be addressed in future research. First, the study focused on general preventive health information rather than specific medical conditions or treatments. Future research should examine whether the effectiveness of different content strategies and parasocial interaction levels varies across different health topics, particularly those that are more complex or stigmatized.

Second, the study used a single exposure to health-related Reels and measured immediate responses. Longitudinal research is needed to assess the long-term impact of Instagram Reels on health literacy and behavior change, including whether repeated exposure to health content from the same healthcare professional strengthens parasocial relationships and enhances outcomes over time.

Third, the study did not examine how viewer characteristics such as prior health knowledge, health motivation, or social media usage patterns might moderate the effectiveness of different content strategies and parasocial interaction levels. Future studies should investigate these potential moderating factors to develop more targeted health communication approaches.

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