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Original Research

Over-the-Counter Medicine Advertising and Behavioral Responses in the South Korean Context: Roles of Health Consciousness, Attention, Attitude, and Subjective Health Knowledge

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ABSTRACT

In South Korea, the market for over-the-counter drug advertising (OTCA) has been increasing in recent years; however, research on OTCA has received scant attention from a psychological perspective. Identifying the antecedents and underlying mechanisms of behavioral responses to OTCA helps us understand how consumers engage in health-related decisions. This study focused on a notable theoretical framework that determines behavioral responses to OTCA. Specifically, this study examined the sequential relationship between health consciousness, attention to OTCA, attitude toward OTCA, and behavioral responses to OTCA. It also tested the boundary conditions of the effect of attitude toward OTCA on behavioral responses by examining the moderating role of subjective health knowledge. A nationwide online survey was conducted. The results showed significant dual mediating effects of attitude and attention on behavioral responses. However, subjective health knowledge did not significantly moderate the sequential relationship between attitude toward OTCA and behavioral responses. These findings have implications for strategy, policy, and practice in both public health fields and the advertising industry. Advertising practitioners and healthcare professionals can gain valuable insights into how to enhance consumers' health-related decision-making for sustainable health promotion.

KEYWORDS

over-the-counter medicine advertising, health consciousness, attention, attitude, subjective health knowledge, direct-to-consumer advertising

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South Korea's market for over-the-counter drug advertising (OTCA), including TV commercials, has risen in recent years, surpassing the level before the COVID-19 pandemic (Kim, 2022). This indicates the relative importance of over-the-counter (OTC) drugs in the healthcare marketplace, as more money is spent on OTCA in the country. The South Korean government agency prohibits direct-to-

consumer prescription drug advertising (DTCA), and prescription drugs can only be promoted by medical professionals and not by stakeholders including TV, radio, newspaper, and social media advertising practitioners. However, OTC drugs can be advertised directly to the public once government agencies and healthcare professionals approve them. OTCA helps consumers make informed decisions about self-medication options, product ingredients and functions, and raises awareness of health conditions and symptoms (Lee et al., 2022). This suggests that OTCA can serve as a powerful channel for providing valuable information and increasing consumer awareness of health issues. Beneficial outcomes of OTCA include disease prevention, empowerment of preventive healthcare, and promotion of healthy behaviors (DeLorme et al., 2010; Koinig et al., 2017; Lee et al., 2022).

Most research on pharmaceutical advertising has focused on DTCA, and little is known about OTCA (DeLorme et al., 2010; Huh et al., 2016; Lee et al., 2015). Specifically, a substantial body of literature on DTCA primarily addresses attitudinal and behavioral outcomes (Jin, 2015). For example, Jiang (2018) found that a positive attitude towards DTCA significantly affects behavioral outcomes, such as the likelihood of talking to a doctor about the advertised drug, medical conditions, health concerns, or treatment changes. Aikin et al. (2021) explored the relationship among exposure, behaviors, and attitudes related to DTCA. Moreover, recent research on OTCA investigated the impact of brand cues and price on purchase intentions in a European context (Aufegger et al., 2021). An exploratory study (Srivastava & Wagh, 2018) also examined various factors that affect purchase behavior in the emerging Indian OTC market.

Although some DTCA studies have explored the opinions of South Korean consumers and healthcare providers (Oh et al., 2015), little systematic research has been conducted on OTCA in South Korea, particularly from a psychological perspective. Therefore, this study is an initial attempt at examining how South Korean consumers respond to pharmaceutical advertisements. The purpose of this study is to examine the relationships between psychological and communication factors in the context of OTCA, specifically focusing on the mediating and moderating roles of health consciousness, attention, attitude, behavioral responses, and subjective health knowledge. The study addresses a gap in the extant literature by offering a comprehensive analysis of how these variables affect consumer behaviors. In doing so, the study provides new insights into the psychological processes underlying consumer responses to OTCA. The findings of the study enhance theoretical understanding of the antecedents of responses to OTCA and offer practical implications for designing more effective health communication strategies. Given the positive roles of OTCA in public health, such as disease prevention, empowerment of preventive healthcare, and promotion of healthy behaviors (DeLorme et al., 2010; Koinig et al., 2017; Lee et al., 2022), the study will inform public health policies and advertising practices to improve the impact of OTCA on consumer behavior.

The HOE Model: Antecedents of Behavioral Responses to OTCA

Behavioral responses to OTCA refer to the behaviors demonstrated by consumers in reaction to OTCA. Engaging in behavioral responses to OTCA entails various actions, such as brand-oriented actions and health care–oriented actions (Huh et al., 2016). Specifically, these include discussing an advertised OTC drug with healthcare providers or other people, searching for drug information, or using the product (Lee et al., 2022). Accordingly, behavioral responses include any observable actions or choices made by consumers resulting from exposure to OTCA. To identify the antecedents of these behavioral

outcomes, recent research has conceptualized several models of DTCA and OTCA effectiveness based on the hierarchy-of-effects (HOE) framework (Huh & Becker, 2005; Huh et al., 2016; Lee et al., 2015; Menon et al., 2004; Oh et al., 2015). Among the various theoretical frameworks that have been used to test the effectiveness of DTCA, Lee et al. (2015) highlighted that the HOE model is particularly prominent.

This model describes a sequence in consumer decision-making: starting from unawareness, moving to awareness, understanding the product, developing positive attitudes, forming a preference, feeling convinced about the purchase, and finally making the purchase (Lavidge & Steiner, 1961). These steps are categorized into three advertising functions: cognition (awareness and knowledge), affection (liking and preference), and conation (conviction and purchase). This perspective articulates the stages individuals undergo during their experiences of shaping attitudes and facilitating behavior. The HOE model specifies the relationships between the key factors influencing the cognitive, affective, and behavioral outcomes of DTCA and OTCA. Research on pharmaceutical advertising has revealed that the type and order of effects depend on the processing conditions, with the behavioral outcome influenced and mediated by various cognitive, affective, and other intervening factors (Huh et al., 2016).

In particular, the HOE model can function as an insightful framework to explain how consumers respond to OTCA by identifying the relationships among the antecedents of behavioral responses, such as communication with healthcare professionals, drug information seeking, and drug trials. Huh et al. (2016) proposed a model of consumer response to OTCA by examining several antecedents and influencing factors. These include socioeconomic status, efficacy, product involvement, advertising involvement, advertising attention, advertising utility, advertising skepticism, advertising trust, and advertising attitude. Although their model highlights important elements that are logically and theoretically connected to responses to OTCA, it needs to be refined to be more parsimonious. Lee et al. (2015) also examined the factors affecting consumer responses to both DTCA and OTCA based on the HOE model. This study proposed a model starting from consumer demographics and health-related variables (e.g., health consciousness), progressing through exposure and attitudinal responses, and resulting in behavioral outcomes. The study performed several hierarchical regression analyses to test direct relationships between independent and dependent variables. However, this approach does not fully capture the sequential and mediating relationships that are better addressed through path analysis.

Given the HOE model that describes a sequence in consumer decision-making includes the cognitive, affective, and behavioral factors of DTCA and OTCA, this study focuses on the relationships between health consciousness, attention, attitude, and behavioral responses to OTCA. In particular, the study also investigates the moderating role of subjective health knowledge as an underlying factor that can affect the direct relationship between attitude and behavioral responses to OTCA. Based on the HOE model, little research has examined the role of moderators that can affect the sequential relationship.

Attitudes toward advertising in general

In the HOE model, one of the critical factors leading to OTCA behavioral outcomes included individuals' general attitudes toward OTCA. Attitude is defined as an individual's affective or evaluative response toward a stimulus object or performing a certain behavior (Fishbein & Ajzen, 1975). It is conceptualized as the amount of positive or negative evaluation or appraisal of an object while directly predicting an individual's behavioral intention. Specifically, attitudes

toward advertising in general also serve as a critical predictor of behavioral outcomes (Jin & Lutz, 2013). It is more likely to result in various outcomes at the cognitive or behavioral level, such as perceptions of the advertised brand (Mackenzie & Lutz, 1989), recall of more advertisements (Donthu et al., 2000; Mehta, 2000), consumers' level of involvement or engagement with advertisements during exposure (James & Kover, 1992), and purchase intention (Mitchell & Olson, 1981).

The general attitude toward advertising is defined as "a learned predisposition to respond in a consistently favorable or unfavorable manner toward advertising in general" (Mackenzie & Lutz, 1989, pp. 53-54). Notably, it should be distinguished from the attitude toward a specific advertisement (An, 2007), given that the former tends to provoke individuals' responses to the latter (Andrews, 1989; Lutz, 1985; Mackenzie & Lutz, 1989; Muehling, 1987). In other words, attitudes toward advertising in general have been suggested as underlying predictors of attitudes toward specific advertisements (Lutz, 1985).

While research (An, 2007; Herzenstein et al., 2004; Huh et al., 2006, 2016; Lee et al., 2007, 2022) has examined the antecedents and/or consequences of the general attitude toward DTCA and/or OTCA, this study also focused on the general attitude to evaluate their overall effect toward OTCA. Few studies have explored the relationship between overall attitudes and behavioral intentions (An, 2007; Huh et al., 2016; Lee et al., 2015; Menon et al., 2004). An (2007) found that those with positive views of DTCA tended to inquire about or request an advertised drug to which they were exposed. This finding is in line with the study by Lee et al. (2015), which revealed that DTCA- and OTCA-prompted behavioral outcomes (e.g., communication with doctors and friends or relatives and advertised drug information seeking) are determined by the general attitude toward DTCA and OTCA. Thus, based on the findings of considerable research, it seems evident that attitudes toward OTCA in general serve as the key predictor of behavioral outcomes. Therefore, this study proposed the following hypothesis:

H1. Individuals' attitudes toward OTCA in general will be positively related to their behavioral responses to OTCA.

Attention to OTCA

To gain insight into the functioning of advertising, it is essential to emphasize the concept of attention paid to advertisements. In the context of advertising, attention is defined as "the amount of conscious thought allocated to an advertisement at a given time" (Alonso Dos Santos et al., 2017, p. 348). Individuals' attention to advertisement messages can enhance their comprehension (McGuire, 1978). Measuring attention to advertisements is the first step in evaluating advertising effectiveness (Lavidge & Steiner, 1961). Advertising attention is unlikely if consumers actively ignore advertisements (Duff & Faber, 2011). This also means that mere exposure to advertisements may not produce adequate effectiveness; however, individuals' attention can play a pivotal role in assessing advertising effectiveness.

Despite its importance, attention to advertisements has rarely been used to measure advertising effectiveness in DTCA research (Menon et al., 2004) until recent studies have examined its relationship with attitudinal and behavioral outcomes. For example, Lee et al. (2015) tested a model that included the perceived amount of attention paid to the DTCA and OTCA. They reported that this was the most significant direct antecedent of attitudes toward DTCA and OTCA. This finding indicates that those who pay considerable attention to the OTCA are more likely to have a positive view of it. Furthermore, they revealed that individuals' attention to OTCA positively and significantly

leads to behavioral responses. Another study (Huh et al., 2016) also found that attention to OTCA for analgesic drugs tends to directly affect attitudes toward OTCA or has an indirect influence via perceived advertising utility and skepticism.

Empirical evidence of the relationship between attention and attitude/behavioral intentions can be articulated theoretically by the HOE model. The HOE advertising model delineates the sequential stages that consumers undergo when shaping or changing their attitudes and purchase intentions. For example, the HOE model of advertising (Smith et al., 2008) depicts a sequence spanning cognition (e.g., attention), affect (e.g., attitude), and intention (e.g., purchases). In other words, this is the process of learning about a product/brand, acquiring knowledge, forming an attitude, and finally taking action. Relevant studies (Bellman et al., 2019; Menon et al., 2004; Puskarevic et al., 2016; Yang et al., 2020) indicate that attention is necessary for consumer response processing, including attitudes toward advertising or behavioral intentions. Based on these relevant research findings and the theoretical framework, the following hypotheses were proposed:

H2. Individuals' attention to OTCA will be positively related to their attitudes toward OTCA in general.

H3. Individuals' attention to OTCA will be positively related to their behavioral responses to OTCA.

Health Consciousness

This study also focused on health consciousness, another influencing factor that can lead to behavioral responses to OTCA. Despite no consensually definitive statement of this construct, prior research (Hong, 2009, 2011) conceptualized it from various disciplines, defining it as "a comprehensive mental orientation toward health, consisting of self-health awareness, personal responsibility for one's health, and health motivation" (Hong, 2011, p. 345). Centering more on an individual's healthy lifestyle, it is also described as "the degree to which health concerns are integrated into a person's daily activities" (Jayanti & Burns, 1998, p. 10). Importantly, the construct of health consciousness is multifaceted and includes three constituents: (1) self-health awareness, (2) personal responsibility for one's health, and (3) health motivation (Hong, 2011). Specifically, individuals with high self-health awareness will likely be attentive to their health conditions through active self-monitoring. Second, health-conscious people participate in health-oriented activities with a high level of active personal responsibility (Dutta-Bergman, 2004). Finally, those with a high level of motivation tend to improve and maintain their quality of life by engaging in healthy behaviors (Dutta-Bergman, 2006; Kraft & Goodell, 1993). Thus, health consciousness reflects an individual's readiness to continuously improve or maintain her health and quality of life.

Health consciousness may affect attention to OTCAs as a consumer characteristic and predisposing factor. The primary factor influencing attention is consumers' perception of the importance of OTC drugs, regardless of how engaging the advertising for OTCA may be (Huh et al., 2016). Perceived importance can be amplified by personal relevance, which refers to "the perceived linkage between an individual's needs, goals, and values and his/her product knowledge (i.e., product attributes and benefits)" (Celsi & Olson, 1998, p. 211). Specifically, individuals consider a message personally relevant when it holds inherent importance, carries emotional weight, or has a major impact on their personal lives (Kuzmičová & Bálint, 2019). Experimental evidence (Petty & Cacioppo, 1979) suggests that individuals pay more attention to personally meaningful messages and that increased levels of personal relevance increase the scrutiny and attention paid to messages.

Due to the health consciousness of individuals predisposed to actively monitoring their health (Hong, 2011), they are more likely to perceive their heightened motivation to respond to the importance of and personal relevance to OTC drugs. For example, consumers tend to respond only to DTCA, which describes health conditions that are either pertinent to them or could become relevant in the future (Menon et al., 2004). This suggests that consumers with a high level of health consciousness perceive OTC drugs as important based on their perceived relevance. Given that attention is selective and limited by factors related to ability and motivation (Ball & Hollin, 2022), health-conscious consumers can focus on the OTCA. Therefore, the following hypothesis was proposed:

H4. Individuals' health consciousness will be positively related to their attention to OTCA.

Empirical research examining the relationship between health consciousness and health-related outcomes at the cognitive, attitudinal, and behavioral levels has yielded mixed findings. Previous studies reported that health consciousness tends to increase the likelihood of communicating about health with others (Gould, 1990), seeking relevant health information (Dutta-Bergman, 2005), coping with health messages (Iversen & Kraft, 2006), and shaping positive attitudes towards organic products (DiPietro et al., 2016). However, other studies have yielded inconsistent results, showing that it is not significantly related to response efficacy (Jayanti & Burns, 1998), perception of food quality to dine out (DiPietro et al., 2016), or purchase intention of organic produce (Michaelidou & Hassan, 2008). Lee et al. (2015) found that health consciousness did not significantly affect attitudes toward DTCA but OTCA. Furthermore, it failed to significantly affect DTCA/OTCA-prompted behavior. Based on these mixed results and the paucity of OTCA-specific research in South Korea, further investigation is required to identify the influence of health consciousness. Therefore, the following research questions are proposed:

RQ1. To what extent does individuals' health consciousness relate to their attitudes toward OTCA in general?

RQ2. To what extent does individuals' health consciousness relate to their behavioral responses to OTCA?

Moreover, in addition to examining the direct links between the variables mentioned, this study investigates how health consciousness indirectly affects behavioral responses to OTCA through the mediating roles of attention and attitudes. Understanding these mediating factors is important because it can uncover the pathways through which health consciousness influences behavioral responses, providing valuable insights for health communication strategies. Given insufficient empirical evidence supporting specific hypotheses on this dual mediation effect, this study presents the following research question:

RQ3. How do individuals' attitudes toward OTCA in general and attention to OTCA mediate the relationship between their health consciousness and behavioral responses to OTCA?

Moderating Effect of Subjective Health Knowledge

As reviewed earlier, attitudes toward DTCA or OTCA are expected to positively affect prompted behavioral outcomes. It is also critical to investigate the underlying factors that can affect the relationship because not all attitudes always have the same influence on perception and behavior change (Fazio, 1989). This study pays attention to subjective health knowledge as

one of the underlying factors that may occupy a role in exerting an influence on the relationship. Individuals' knowledge comprises two constructs: objective knowledge and subjective knowledge (Park & Lessig, 1981; Park et al., 1994). Subjective knowledge is "people's perceptions of what or how much they know about a product class" (Park et al., 1994, p. 71). It is different from objective knowledge, which refers to "accurate information about the product class stored in long-term memory" (Park et al., 1994, p. 71). The former reflects what consumers think they know, whereas the latter represents what consumers know (Alba & Hutchinson, 2000). In the information search and decision-making processes, subjective knowledge is considered a critical construct (Pieniak et al., 2010) and is more important in affecting behaviors than objective knowledge (Feick et al., 1992). Individuals are often more likely to employ or depend on subjective knowledge because they cannot recall all available information stored in their memory to guide their decision-making.

Health knowledge is defined as 'the extent to which consumers have enduring health-related cognitive structures" (Moorman & Matulich, 1993, p. 210), representing their storehouse of information about preventive healthcare behaviors (Jayanti & Burns, 1998). Accordingly, subjective health knowledge can be seen as perceived self-confidence, self-judgment, and familiarity with how well an individual knows about health issues and information. Existing research on the moderating effect of subjective health knowledge presents mixed findings. An (2007) reported that the positive relationship between attitudes toward DTCA and behavioral outcomes tends to be greater among consumers with a high level of subjective health knowledge. Specifically, those with sufficient subjective health knowledge were more willing to inquire about or request the advertised drug from their doctors than those with low knowledge. This suggests that knowledge gained via direct behavioral experience is expected to be held with greater certainty and subsequently affects the strength of the relationship between attitude and behavior (Fazio & Zanna, 1981; Nabi et al., 2008). Moreover, individuals' confidence or knowledge in processing messages can moderate this relationship (Petty & Cacioppo, 1981; Petty & Krosnick, 1995). By contrast, Fu and Elliott (2013) found no significant moderating effect of subjective knowledge on the relationship between product use attitude and purchase intention. Moreover, B. Jin and Park (2023) revealed a significant moderating effect of subjective health knowledge on the sequential relationship between attitude and behavioral intention regarding donating hematopoietic stem cells. However, this relationship was more significant in the group with lower than in the group with higher levels of subjective health knowledge. Based on the inconsistent findings of these studies, the moderating role of subjective health knowledge may differ depending on contingent conditions. Therefore, this study addressed the following research questions:

RQ4. Does subjective health knowledge moderate the relationship between attitudes toward OTCA in general and behavioral responses? If so, to what extent does subjective health knowledge moderate the relationship?

METHOD

Procedures

Given the widespread adoption of smartphones among South Korean adults, which stands at 97% as of 2023 (Gallup Korea, 2023), conducting an online survey was a reasonable decision. A cross-sectional online survey was conducted to collect data from a nationwide research agency in South Korea between October 13th and 16th, 2023.

A national quota sample (gender and age) was drawn from 3,630 pre-recruited panelists via email and invitation. Of these, 519 individuals accessed the survey. Of those who accessed the survey, 81 individuals were screened out because they had not seen any drug advertisements on television, radio, newspaper, magazine, outdoor advertising, or the Internet/mobile phone in the past year. The rationale behind the screening criterion was to ensure that all participants had recent exposure to drug advertising. This exposure was a basic aspect of the study's focus on behavioral responses to OTCA. This study was conducted in accordance with ethical standards. Respondents were instructed that their participation was voluntary and that their information and responses would remain anonymous.

Measurements

The survey questionnaire measured the following key variables: (a) behavioral outcomes, (b) health consciousness, (c) attention to OTCA, (d) attitude toward OTCA, and (e) subjective health knowledge. Except for the screener (OTC advertising exposure) and control variables (sex, age, education, monthly income, and perceived health status), all items were measured using a Likert scale from 1 (strongly disagree) to 5 (strongly agree).

To measure individuals' behavioral outcomes, the following five items adopted and modified from previous research (Lee et al., 2022) were used: "After seeing, reading, or hearing ads for drugs, I have talked with a doctor about an advertised drug," "I have talked with a pharmacist about an advertised drug," "I have talked with my friends or family about an advertised drug," "I have searched for more information about an advertised drug," and "I have ever bought an advertised drug" ($\alpha = .849$, $M = 2.970$, $SD = 0.792$). Health consciousness was gauged with five items from previous research (Lee et al., 2015): "Living life in the best possible health is very important to me," "Eating right, exercising, and taking preventive measures will keep me healthy for life," "My health depends on how well I take care of myself," "I actively try to prevent disease and illness," "I do everything I can to stay healthy" ($\alpha = .789$, $M = 4.006$, $SD = 0.510$). Attention to OTCA was measured by asking participants a single item modified from previous research (Huh et al., 2016): "I pay attention to drug ads in general that I encounter" ($M = 3.200$, $SD = 0.851$). Attitude toward OTCA in general was measured with four items from previous research (Lee et al., 2015): "I feel that drug ads are good/favorable/positive/pleasant" ($\alpha = .824$, $M = 3.154$, $SD = 0.568$). Subjective health knowledge was assessed using a single item from prior research (An, 2007): "I think that I have much knowledge about health or medicine" ($M = 2.970$, $SD = 0.885$). The control variables included perceived health status (1 = poor to 5 = excellent) and several demographic items (sex, age, education, and monthly income) because they were found to influence behavioral outcomes (Huh & Becker, 2005).

Analytical Methods

Descriptive, correlational, dual mediation, and moderation analyses were performed. SPSS (version 26.0) and PROCESS macro 4.1 (Hayes, 2018) were used for the dual mediation and moderation analyses. Model 6 of PROCESS macro 4.1 was selected to test the dual mediation effect (H1, H2, H3, H4, RQ1, RQ2, and RQ3), while Model 1 was chosen for the moderation effect (RQ4). To test the mediation effect, this study used bootstrapping with 5,000 samples. This method was employed to test the significance of mediation effects, which were confirmed if the 95% confidence interval (CI) of the indirect effect value did not include zero (Hayes, 2018). For moderation effect analysis, the independent and moderating variables were mean-centered and entered into the analysis.

RESULTS

Participants

Of the 3,630 people who received an invitation e-mail, the final 270 responses (N = 270) were used for data analyses after excluding those filtered out by the screening question (exposure to OTCA), as well as incomplete responses and untrustworthy responses (completion times being either too short or too long). The final sample consisted of 69.3% females and 30.7% males, and was distributed across the following age ranges (M = 40.89 years; SD = 12.985; Min = 20; Max = 69): 20–29 (25.2%), 30–39 (25.2%), 40–49 (24.8%), 50–59 (12.6%) and over 60 (12.2%), and across the following levels of education: less than a high school diploma (14.1%), college students (7.4%), bachelor's degree (69.6%), and graduate degree (8.9%); the majority (34.1. %) of the monthly house income was between 3 to 5 million KRWs (approx. USD 2,300 to 3,900); and the majority of the health status indicated 51.1% not bad.

Correlation Analysis

The correlation matrices for all the observed variables are presented in Table 1. All correlations between behavioral responses and major variables (health consciousness, attention, attitude, and subjective health knowledge) were significant (p < 0.05, two-tailed).

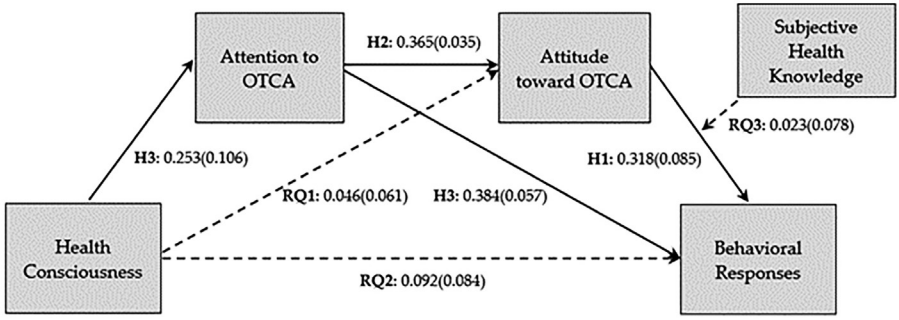
Direct Effects

This study predicted that individuals' attitudes toward OTCA in general would positively affect their behavioral responses to OTCA (H1) and that individuals' attention to OTCA would positively affect their attitude (H2) and behavioral responses (H3). The study also posited that individuals' health consciousness would positively affect their attention to OTCA (H4) while addressing whether health consciousness can positively affect attitudes (RQ1) and behavioral responses (RQ2). As shown in Figure 1, after controlling for covariates (i.e., sex, age, education, monthly income, and health status), the direct effect of attitude on behavioral responses was positive and significant [p < .001, b = 0.318, SE = 0.085, 95% CI= (0.151, 0.485)]. Therefore, H1 is supported. Attention also showed a positive and significant direct effect on attitude [p < .001, b = 0.365, SE = 0.035; 95% CI = (0.295, 0.434)] and behavioral responses [p < .001, b = 0.384, SE = 0.057; 95% CI = (0.271, 0.497)], respectively. Therefore, H2 and H3 are supported. The direct effect of Health consciousness was positively

Table 1. *Correlation Analysis*

	1	2	3	4	5	6	7	8	9
1. Sex (male=0)	-								
2. Age	-.291***	-							
3. Education	-.048	-.183**	-						
4. Monthly income	-.020	.081	.221***	-					
5. Health status	-.051	-.109	.162**	.045	-				
6. Health consciousness	-.159**	.245***	-.088	.035	.192**	-			
7. Attention to OTCA	.022	.174**	.040	.036	-.018	.164**	-		
8. Attitude toward OTCA	.036	-.103	-.006	.015	.115	.110	.509***	-	
9. Subjective health knowledge	-.074	.111	-.099	-.039	.162**	.381***	.165**	.139*	-
10. Behavioral responses	.027	.083	.052	.016	.032	.151*	.547***	.441***	.276***

Figure 1. *Mediation and Moderation Model of Antecedents of Behavioral Responses to OTCA*



Note. Values outside parentheses = unstandardized coefficient; values in parentheses = standard error. Significant paths are denoted by solid lines. Nonsignificant paths are denoted by dashed lines.

Table 2. *Indirect Effects*

Paths	Coefficient (*SE*)	95% CIs
health consciousness → attention to OTCA → behavioral responses	0.097 (0.046)*	[0.027, 0.257]
health consciousness → attitude toward OTCA → behavioral responses	0.015 (0.022)	[-0.025, 0.063]
health consciousness → attention to OTCA→ attitude toward OTCA → behavioral responses	0.029 (0.015)*	[0.003, 0.064]

*$p < .001$.

related to attention [$p = .018$, $b = 0.253$, $SE = 0.106$; 95% CI = (0.044, 0.462)], supporting H4. Finally, health consciousness was not significantly related to attitude [$p = .453$, $b = 0.046$, $SE = 0.061$; 95% CI = (-0.075, 0.167)] or behavioral responses [$p = .276$, $b = 0.092$, $SE = 0.084$; 95% CI = (-0.074, 0.258)].

Indirect Effects

This study also addressed how individuals' attitudes toward OTCA in general and attention to OTCA mediate the relationship between their health consciousness and behavioral responses to OTCA (RQ3). The study tested the indirect effects of the dual mediation model (Table 2). The magnitude of the total indirect effect was 0.141, which was statistically significant because the 95% CI bootstrapping lower bound (0.027) and upper bound (0.257) did not include zero. Next, by testing the significance of two simple indirect effects, the study found that the first indirect effect of "health consciousness → attention to OTCA → behavioral responses" was statistically significant (coefficient = 0.097; $SE = 0.046$) because the 95% confidence interval bootstrapping lower bound (0.027) and upper bound (0.257) did not contain zero. The second indirect effect of "health consciousness → attitude toward OTCA → behavioral responses" was not statistically significant [(coefficient = 0.015; $SE = 0.022$), 95% CI = (-0.025, 0.063)]. Finally, the magnitude

of the indirect effect of "health consciousness → attention to OTCA → attitude toward OTCA → behavioral responses," which indicates a dual mediation effect, was statistically significant [coefficient = 0.029, *SE* = 0.015, 95% CI = (0.003, 0.064)].

Moderating Effects of Subjective Health Knowledge

RQ4 addressed whether subjective health knowledge was more likely to moderate the relationship between attitudes toward OTCA in general and behavioral responses. The results indicated that the moderating effect was not statistically significant (interaction term: $b = 0.023$, $SE = 0.078$, $p = .771$) after controlling for demographic characteristics, health consciousness, and attention to OTCA. Therefore, subjective health knowledge does not tend to show any significant moderating effect on the relationship between attitudes toward OTCA and behavioral responses.

DISCUSSION

By identifying the critical antecedents of behavioral responses to OTCA in South Korea, this study examined how health consciousness, attention to, and attitude toward OTCA in general lead to consumer behavioral outcomes through a dual mediation analysis. Moreover, it tested the moderating role of subjective health knowledge on the impact of attitudes toward OTCA on behavioral responses. The findings demonstrate that consumers' health consciousness is more likely to generate significant behavioral responses to OTCA through two mediating variables: attention and attitude. In addition, consumers' subjective health knowledge did not significantly moderate the relationship between attitudes toward OTCA and behavioral responses. These findings have important implications in addressing consumers' health-related decisions and OTCA practices for sustainable health behaviors.

Attitude toward OTCA in general was found to be a significant predictor of behavioral responses. This finding corroborates prior research (Huh et al., 2016; Lee et al., 2015), which found the impact of attitude on behavioral outcomes. By advancing the research on attitudes toward OTCA, this study contributes to the extant literature on attitudes toward OTCA and behavioral change, which have been relatively less explored than DTCA research. Attitudes toward OTCA serve a vital role in the stages consumers go through during their experience of facilitating health decision-making. Moreover, given that attitudes toward advertising in general have been considered an underlying predictor of attitudes toward specific advertisements (Lutz, 1985), those with favorable views of OTCA in general could accept a specific OTC positively, which predicts health decisions. Thus, the theoretical strength of OTCA's attitude in general lies in its utility in explaining consumers' sustainable health behaviors via OTCA, such as consultations with healthcare professionals, health-related communication with others, health information seeking, and purchase behavior.

The significant influence of attention to OTCA on attitudes toward and behavioral responses to it provides insights into its psychosocial processes and effects. This study parallels other studies that have revealed its impact on attitude, perceived utility, skepticism, OTCA-prompted behaviors, and information search (e.g., Huh et al., 2016; Lee et al., 2015). This finding contributes to the existing literature on HOE advertising models that delineate sequential stages spanning cognition (attention), affect (attitude), and intention (purchases). Attention to OTCA can be deemed a crucial antecedent of health behavior changes, such as healthcare decision-making and assessing its effectiveness. Moreover, given the dearth of relevant research in South Korea, this study adds

an important dimension to OTCA research by examining the sequential relationship between attention, attitude, and health behavior changes.

The indirect influence of consumer health consciousness on the behavioral outcomes of OTC is also noteworthy. Despite its crucial theoretical implications, extant research has rarely examined the role of health consciousness in understanding the psychological processes of OTCA or DTCA effects, with only a few exceptions (e.g., Lee et al., 2015). As a consumer characteristic and predisposing factor, it can serve as an antecedent to facilitating self-health awareness, personal responsibility for one's health, and health motivation (Hong, 2011). This suggests that health-conscious consumers are more likely to ensure their readiness to promote their health, which will increase their attention to health-related information such as OTCA. As indirect effects on the behavioral outcomes of OTC were found, health consciousness generated behavioral outcomes via two different routes: first, through the simple mediating role of attention, and second, through the serial mediating role of attention and attitude toward OTCA in general. Although there was no significant direct relationship between health consciousness and the outcomes, the two mediation effects were significant. These findings imply that OTCA-related factors, such as attention and attitude, should be acknowledged in understanding the underlying process of the impact of health consciousness and orientation on health-related decision-making.

Notably, this study revealed that consumers' subjective health knowledge did not significantly moderate the relationship between attitudes toward OTCA in general and behavioral responses. Among the mixed findings on its moderating role in prior research, this study suggests that subjective health knowledge is unlikely to serve as a moderating variable or a potential boundary condition in that sequential relationship. This finding is inconsistent with previous studies on DTCA (An, 2007). An alternative explanation could be that its moderating effect was tested in different contexts, such as OTCA versus DTCA and South Koreans versus U.S. citizens. Thus, this finding builds upon extant health-related research on the moderating role of subjective health knowledge. Despite its insignificant effect, the role of subjective health knowledge cannot be disregarded because it is still significantly and positively correlated with behavioral responses.

This study also has practical implications for the advertising industry for OTC drugs and public health professionals aimed at promoting sustainable health behaviors and decision-making. As attention and attitude can positively influence health-related behaviors, OTCA practitioners should attempt to design advertising strategies to (1) attract consumers' attention to OTCA and (2) shape their favorable views of OTCA. For example, OTCA practitioners must use persuasive strategies that appeal to cognition and affection, such as making consumers believe that consuming OTCA information can help them prevent specific diseases. Moreover, OTCA practitioners and healthcare professionals can help consumers accept OTCA as a public communication or health education channel. Finally, identifying the levels of health consciousness among potential OTCA consumers will help practitioners segment target audiences more specifically.

This study has a few limitations. First, cross-sectional analyses may preclude insights into the causal relationship between the independent variable, mediating variables, and behavioral responses. In this respect, future research could benefit from an experimental study or an approach based on a longitudinal panel study to make stronger causal claims. Second, quota sampling, like non-random sampling methods, may pose challenges in generalization of the study findings. The study also used a self-reported online survey, which might have hindered the measurement of how consumers respond to

OTCA in real situations. Moreover, scholars may wish to investigate other predictors of behavioral responses, including involvement with drugs or amount of exposure to OTCA as cognitive factors, in addition to skepticism toward OTCA as an affective factor. Additionally, specific OTCA, instead of OTCA in general, can be considered to examine their effects based on the HOE frameworks.

CONCLUSIONS

As the findings of this study unfold, it becomes evident that their implications deepen our understanding of the factors that influence sustainable health behaviors via OTCA. The theoretical and practical implications highlight its potential to serve as a cornerstone for future investigations in psychology and communications. Specifically, in South Korea and other cultural contexts, little research has been conducted to examine the sequential relationship between consumers' health consciousness and behavioral responses to OTCA by identifying mediating factors such as attention and attitude. As we navigate the practical implications of this study, it becomes clear that its impact promises to inform strategy, policy, and practice in public health fields and advertising industry. Advertising practitioners and healthcare professionals for sustainable health promotion can benefit from understanding the underlying process of antecedents and their relationships to improve consumers' health-related decision-making.

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