

Investigating Sharing Intentions for Online Public Health Education Games

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ABSTRACT

Insomnia has become an important public health issue, affecting physical and mental health while increasing the misuse of sedative and hypnotic medications. Recent studies have shown that both hypnotic use and non-medical use (NMU) in Taiwan continue to rise, highlighting the importance of Health Education regarding the proper use of hypnotics. However, most current Health Education campaigns still rely on one-way information dissemination and lack interactivity and entertainment, making it difficult to encourage public engagement and health information sharing. As Social Platforms have become important channels for health communication, promoting Health Education through more attractive approaches has become an important issue. Therefore, this study used the online game. The Nap Master's Odyssey, developed by the Food and Drug Administration of Taiwan, to explore the relationships among Perceived Usefulness, Perceived Enjoyment, and Sharing Intentions among users of different genders. The game combines narrative scenarios, interactive quizzes, and instant feedback to teach proper knowledge regarding sedative and hypnotic medications, while also providing personalized guardian characters, sharing interfaces, and recommended medication information. A total of 202 questionnaires were collected, of which 196 were valid. The results showed that both Perceived Usefulness and Perceived Enjoyment had significant positive effects on Sharing Intentions, while males scored significantly higher than females in Perceived Enjoyment and Sharing Intentions. This study confirms that combining personalized results, character-based design, and sharing functions may further enhance users' willingness to share health information and improve the dissemination effects of Health Education games. The findings may serve as a reference for future digital Health Education and health communication design.

Keywords: Health education, Social platforms, Game ending interface, Sharing intentions, Perceived usefulness, Perceived enjoyment

INTRODUCTION

In recent years, the overall usage rate and non-medical use (NMU) of sedative and hypnotic medications in Taiwan have continued to increase, particularly among adolescents and women (Tsay, 2024). In addition, about one-fifth of community-dwelling elderly in Taiwan have experience using sedative sleeping pills, with approximately 5% using them without medical advice (Tseng et al., 2018). As the risks associated with inappropriate use of sedative and

sleeping pills continue to emerge, promoting correct medication knowledge has become an important public health issue. Although the government has promoted Health Education through pharmacists, lectures, and promotional activities (Hung & Hung, 2018), this one-way approach often fails to reach people who do not actively seek information and may even reduce message acceptance (Pan et al., 2024). Therefore, Kuncoro and Kusumawati (2021) suggested adopting more diverse and interactive communication approaches to improve public engagement and reduce resistance. In recent years, the use of serious games and social media for health knowledge dissemination has gradually gained attention (Anwar et al., 2020). Serious games use interactive and gamified processes to deliver knowledge, which can enhance learning motivation, learning outcomes, and continuous participation (Caliston, 2025; Facchino et al., 2025; Stofella & Fadel, 2022).

On the other hand, social media demonstrates strong potential for the dissemination of health information, not only promoting the exchange of health knowledge among the public but also gradually changing the way medical information is conveyed (Arif et al., 2024). For individuals, social media provides instant, low-threshold health messages, enabling the public to actively search for, understand, and share health content relevant to their own lives (Kim et al., 2023). For the government and medical institutions, social platforms have also become important tools for health education and promotion (Wang & Lin, 2023). According to Wei Hanning et al. (2022), the Taiwan-ese government actively used new media such as Facebook, LINE, and YouTube during the COVID-19 pandemic to conduct health education and risk communication, thereby increasing information reach and enhancing public knowledge of epidemic prevention. Additionally, Wei Mixiu et al. (2023) pointed out that medical institutions can improve public health literacy and bridge the gap between medical professionals and the public through posts, videos, and interactive content. Over-all, social media offers real-time communication and can enhance public interaction and participation, making it an important tool for promoting health education. To ensure that the public is not troubled by insomnia and to prevent further harm, Taiwan's Ministry of Health and Welfare Food and Drug Administration announced in 2024 the 'Establishment of a Correct Usage of Sedative and Hypnotic Drugs Online Game Educational Program'. Subsequently, they launched an educational online game called 'The Nap Master's Odyssey' which is designed to promote the proper use of sedative and hypnotic medications. Simply by opening this online game on a computer or mobile phone, users can participate. The aim is to develop an online educational game that makes it easier for the public to access, while also helping them understand the correct knowledge for using sedative and hypnotic drugs, the importance of following doctors' or pharmacists' instructions, and to prevent misuse and the diversion of these medications.

Based on this, the present study uses the online serious game 'The Nap Master's Odyssey', developed by the Food and Drug Administration of the Ministry of Health and Welfare, as an example to explore whether there are significant differences between different genders in their perceptions of the actual learning benefits and entertainment value after experiencing this game. Additionally, it examines whether the perception that the game

effectively combines educational content on the correct use of sedatives and sleep aids influences their intention to share the game results on social media platforms. Furthermore, the study investigates whether the enjoyment derived from the game process encourages individuals to voluntarily share their game outcomes on social media, thereby enhancing the effectiveness of health promotion and dissemination. Therefore, this study establishes the following research objectives:

(1) To explore whether there are significant differences in perceived usefulness and perceived enjoyment after playing ‘The Nap Master’s Odyssey’ across different genders. (2) To examine the impact of perceived usefulness on sharing intention after playing ‘The Nap Master’s Odyssey’. (3) To investigate the influence of perceived enjoyment on sharing intention after playing ‘The Nap Master’s Odyssey’.

FACTORS INFLUENCING COMMUNITY SHARING ON SOCIAL MEDIA

In addition to serious games being used as educational tools, social media has become the most direct and convenient channel for users to acquire health knowledge and share health content, thereby further promoting the dissemination of health information. Exploring the factors that influence users’ intention to share has become an important issue. Past research has often used the Technology Acceptance Model (TAM) as the theoretical basis, attempting to explain users’ information-sharing behavior on social platforms (Lee et al., 2025).

In the context of health information sharing, perceived usefulness is regarded as an important predictor that encourages users to share; that is, when users believe that health information has value and can enhance their own or others’ health knowledge, they are more likely to have the intention to share (Xiang et al., 2023).

Explaining user behavior solely from a functional perspective today is considered to overlook the entertainment aspect inherent in the game itself (Linares et al., 2021). Therefore, perceived enjoyment (PE) is often introduced as a supplementary construct to address TAM’s explanatory limitations regarding entertainment and to more comprehensively examine users’ adoption and behavioral mechanisms toward specific systems (Abdalla, 2024). Perceived enjoyment is regarded as an important factor influencing information-sharing behavior and is often defined as the degree of pleasure and enjoyment users experience when using a system, regardless of external rewards or negative impacts (Venkatesh, 2000). The systematic review by Hu and Noor (2024) also indicates that enjoyment is a key factor in promoting the intention to share knowledge, and Cai et al. (2021) further confirmed that when users experience a higher level of enjoyment during social interactions, their intention to share knowledge also increases. It can be seen that perceived enjoyment has become an important motivation for users to engage in sharing behavior. In terms of game usage behavior, if the aim is to enhance user engagement, ‘fun’ is also a key factor (Linares et al., 2021).

Therefore, both studies on health information sharing and gaming behavior indicate that perceived usefulness and perceived enjoyment significantly affect users' engagement and sharing. The former represents an evaluation of functional benefits, while the latter reflects the entertainment aspect of fun. Together, they form the core basis of users' behavioral intentions. Consequently, this study focuses on perceived usefulness and perceived enjoyment as the main dimensions, analyzing the public's intention to share serious games. The intention to share is heightened when health information within the game provides educational value, and users can also experience enjoyment.

THE NAP MASTER'S ODYSSEY

The research material used in this study was The Nap Master's Odyssey, an online game developed by the Food and Drug Administration of the Ministry of Health and Welfare. The game can be played directly on computers and mobile devices without downloading. Its main objective is to promote the correct use of sedatives and hypnotics through a gamified learning approach (see Figure 1).



Figure 1: The Nap Master's Odyssey main page, the left image is the computer version, and the right image is the mobile version (taken from: <https://nightkeeper.net/questionnaire>).

The gameplay lasts approximately 10–20 minutes and adopts narrative storytelling and interactive Q&A design. The game includes questions related to sleep habits and the correct use of sedative and hypnotic medications. The question design incorporates the “Five Core Competencies for the Correct Use of Sedatives and Hypnotics,” allowing players to learn medication knowledge during gameplay.

In addition, the game ending provides personalized guardian creature results and medication suggestions based on the player's responses and performance. The ending screen also includes a sharing function that allows players to share their results on social platforms such as Facebook, Threads, and LINE, thereby enhancing interactivity and the dissemination of health education information (see Fig. 2).

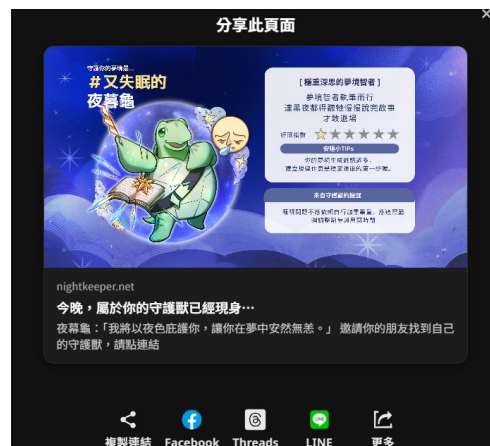


Figure 2: The Nap Master's Odyssey Game Ending Sharing Screen (taken from: <https://nightkeeper.net/questionnaire>).

RESEARCH HYPOTHESES

In learning contexts, males tend to find gamification tools more enjoyable and useful than females (Eppmann et al., 2018), but Subhash and Cudney (Subhash & Cudney, 2018) found no significant difference in perceived usefulness, suggesting that the design of gamified software appeals to both genders, though personal factors may also play a role. Regarding perceived enjoyment, females generally report lower enjoyment of gamification tools than males, and in nongamified situations, gender does not significantly relate to enjoyment (Mellado et al., 2024). Therefore, the influence of gender on perceived usefulness and enjoyment in gamified environments remains inconclusive, though most studies indicate potential differences in user experience. Consequently, this study further investigates gender differences in perceived usefulness and enjoyment within the context of serious games and proposes the following hypotheses:

H1: Users' gender significantly affects perceived usefulness.

H2: Users' gender significantly affects perceived enjoyment.

In systematic reviews of social media knowledge sharing, perceived usefulness is considered a key factor influencing users' sharing intentions (Hu & Noor, 2024). When users perceive health information as valuable and capable of enhancing their own or others' health knowledge, they are more likely to share proactively (Xiang et al., 2023). Additionally, in gaming contexts, enjoyment is also a crucial psychological factor influencing participation. Linares et al. (2021) identified perceived enjoyment as a critical factor in increasing user engagement in games and suggested that, along-side perceived usefulness, it can explain users' intentions and behaviors regarding game use. When users experience both practicality and entertainment during gameplay, they are more inclined to share health information conveyed through the game (Hu & Noor, 2024). Therefore, this study proposes the following hypotheses:

H3: The higher the perceived usefulness, the greater the sharing intention.

H4: The higher the perceived enjoyment, the greater the sharing intention.

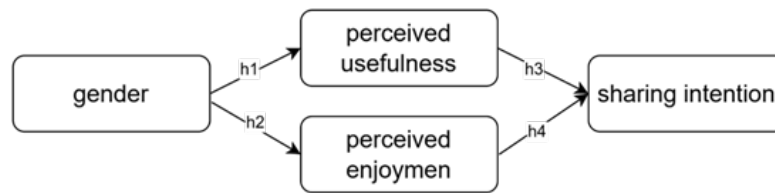


Figure 3: Research framework diagram.

Questionnaire Design

This study's questionnaire consisted of three dimensions: perceived usefulness, perceived enjoyment, and sharing intention, with a total of 12 items measured using a five-point Likert scale. Higher scores indicated stronger agreement with each construct. Perceived usefulness measured whether participants considered the health education content in *The Nap Master's Odyssey* to be practical and valuable. Perceived enjoyment assessed the level of enjoyment experienced during gameplay and interaction. Sharing intention evaluated participants' willingness to share game-related health education information on social media platforms (see Table 1).

Table 1: Measurement scales and sources of the questionnaire.

	Question	Author
Perceived Usefulness	1. After using the 'Correct Use of Sedative Sleep Medication Game', I can correctly answer knowledge questions related to sedative sleep medications; 2. Compared to traditional reading materials, I find learning through the 'The Nap Master's Odyssey' more efficient; 3. The interactive levels and quizzes in the 'The Nap Master's Odyssey' help me understand the correct usage of sedative sleep medications; 4. The quiz content in the 'The Nap Master's Odyssey' helps me remember the methods and precautions for using sedative sleep medications.	Alnuaim (2024)
Perceived Enjoyment	1. The storyline of 'The Nap Master's Odyssey' made me feel very interested; 2. I felt happy when completing the interactive mini-games within 'The Nap Master's Odyssey'; 3. New challenges or characters appearing in 'The Nap Master's Odyssey' made me feel excited; 4. The visuals, sound effects, and control methods of 'The Nap Master's Odyssey' made me feel relaxed and happy during gameplay.	Linares et al. (2021)

(Continued)

Table 1: Continued.

	Question	Author
Sharing Intentions	1. After I complete ‘The Nap Master’s Odyssey’, I am willing to share my game results (personalized animal avatar and scores) on social media;	Xiang et al. (2023)
	2. If I see others sharing health information or game results related to this game, I would be willing to for-ward it to friends or post it on social media;	
	3. I believe that sharing ‘The Nap Master’s Odyssey’ online game on social media is a good way to share;	
	4. I am willing to recommend this game to others and encourage them to share their char-acter results on social media to discuss and exchange ideas.	

This study employed a convenience sampling method, collecting data through an online questionnaire. Recruitment posters were disseminated via social media to attract participants to experience the game and complete the questionnaire. The questionnaire was distributed and collected using Google Forms, with participants accessing the form through links in the recruitment posters. The primary recruitment platforms were Facebook, supplemented by Dcard.

Results

A total of 202 questionnaires were collected in this study. After removing invalid responses, 194 valid questionnaires remained for analysis. Among the respondents, 56.7% were female and 43.3% were male. In terms of age distribution.

Independent samples t-tests were conducted to examine Hypotheses H1 and H2. The results are presented in Table 3. The Levene’s test results for perceived usefulness and perceived enjoyment yielded F-test of 0.139 and 0.254, respectively, with significance levels greater than 0.05, indicating that the assumption of homogeneity of variances was satisfied. For perceived usefulness, the t-value was 1.352 with a significance level of 0.178 ($p > 0.05$), indicating that H1 was not supported. For perceived enjoyment, the t-value was 2.156 with a significance level of 0.032 ($p < 0.05$), indicating that H2 was supported (see Table 2).

Table 2: Independent samples t-test.

	Levene’s Test for Equality of Variances		Paired-Samples T Test	
	F-test	p-value	T-value	Sig. (2-tailed)
Perceived Usefulness	0.139	0.710	1.352	0.178
Perceived Enjoyment	0.254	0.615	2.156	0.032

* $P < .05$

As shown in Table 4, the adjusted R^2 was 0.198, indicating that perceived usefulness explained 19.8% of the variance in sharing intention. The F-value was 48.534, with a significance level below 0.05, suggesting that the regression model was statistically significant. Furthermore, the t-value was 6.967, with a p-value of 0.000 ($p < 0.001$), indicating that perceived usefulness had a significant effect on sharing intention. The standardized regression coefficient ($\beta = 0.449$) suggests that perceived usefulness had a moderate effect on sharing intention. Therefore, Hypothesis H1, which states that “the higher the perceived usefulness, the higher the sharing intention,” was supported (see Table 3).

Table 3: Simple regression analysis of perceived usefulness.

Model	Unstandardized Coefficient		Standardized Coefficient	T-value	p-value
	B	Standard Error	β		
Perceived Usefulness	0.582	0.084	0.449	6.967	.000
F value	48.534***	R2	0.202	Adj-R2	0.198

* $P < .001$

According to Table 5, the adjusted R^2 was 0.265, indicating that perceived enjoyment explained 26.5% of the variance in sharing intention. The F value was 70.554, with a significance level below 0.001, showing that the regression model was statistically significant. The t-value was 8.400, with a p value below 0.001, indicating that perceived enjoyment had a significant effect on sharing intention. The standardized regression coefficient was 0.449, indicating that perceived enjoyment had a moderate effect on sharing intention. Therefore, Hypothesis H4, which states that “the higher the perceived enjoyment, the higher the sharing intention,” was supported (see Table 4).

Table 4: Simple regression analysis of perceived enjoyment.

Model	Unstandardized Coefficient		Standardized Coefficient	T-value	p-value
	B	Standard Error	β		
Perceived Usefulness	0.622	0.074	0.518	8.400	.000
F value	70.554***	R2	0.269	Adj-R2	0.265

* $P < .001$

CONCLUSION

According to the results of H1, although males perceived higher usefulness than females, the difference was not statistically significant. This suggests that different genders did not significantly differ in their evaluation of the practical value of the health education content in *The Nap Master's Odyssey*. Mellado et al. (2024) found that males in gamified learning environments achieved higher scores than females, although the difference was not significant. This finding may partially explain the higher perceived usefulness among males in this study. However, it remains difficult to determine which game design elements contributed to this difference (Aster et al., 2024). The lack of significant gender difference in H1 may also be related to the integration of both gamification and educational elements, which engaged males and females similarly (Subhash et al., 2018).

Regarding H2, males reported significantly higher perceived enjoyment than females, indicating gender differences in gameplay enjoyment. Previous studies suggested that the effects of gamification may vary depending on game elements and design approaches, such as points, badges, and competitive mechanisms (Koch et al., 2026). In addition, males tend to prefer challenging, competitive, and reward-oriented game content (Rapp et al., 2019). Although *The Nap Master's Odyssey* focuses on health education, it includes mission progression, character transitions, and outcome feedback, which may explain the higher perceived enjoyment among males.

From a health information perspective, Xiang et al. (2023) noted that perceived usefulness influences people's willingness to share health information. Consistent with H3, when users perceived the health education content in the game as beneficial, they were more willing to share their game results on social platforms. H3 also confirmed that integrating health education content with game design could increase sharing intention.

At the game level, H4 indicated that perceived enjoyment significantly influenced sharing intention. Linares et al. (2023) identified perceived enjoyment as an important factor affecting continued participation and behavioral intention. *The Nap Master's Odyssey* enhances engagement and entertainment through story scenarios, interaction mechanisms, and personalized feedback. The character and score-based feedback presented at the game ending are also similar to the concepts of "badges" and "feedback" in gamification, which may strengthen user engagement (Fanfarelli & McDaniel, 2018). Since both H2 and H4 were supported, the findings may be related to the game-ending design, and future studies are recommended to further explore the influence of such feedback designs.

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