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Attitude Toward Virtual Rehabilitation and Active Video Games Among Therapists in Korea: A Nationwide Survey

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Bong-Keun Jung, Dae-Sung Park, Sungju Jee, Sung-Hwa Ko, Joon-Ho Shin,
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HIGHLIGHTS

- Explored attitudes toward virtual reality (VR) among therapists.
- Therapists with VR/active video games experience scored higher in most categories.
- Biggest barriers were insufficient funds and setup assistance for the equipment.

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Attitude Toward Virtual Rehabilitation and Active Video Games Among Therapists in Korea: A Nationwide Survey

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ABSTRACT

In this study, we conducted a survey targeting 191 physical therapists (PTs) and 159 occupational therapists (OTs) in South Korea to explore attitudes toward virtual rehabilitation. Utilizing the Korean version of the ADOPT VR by Glegg et al., OT exhibited significantly more experience with virtual reality (VR) and active video games (AVG) than PT. Therapists with VR/AVG experience scored significantly higher in most categories, and the scores in each category were significantly correlated with the Behavioral Intention category, reflecting the willingness to use VR/AVG. The biggest barriers identified were insufficient funds and setup assistance for the equipment. Differences in responses between the groups with and without VR/AVG experience were most prominent in terms of lack of interest and funding. Therapists' attitudes, perceptions, and intentions toward VR/AVG are crucial factors in the establishment and implementation of VR/AVG; thus, the results of this study provide valuable evidence for future policies related to VR/AVG in rehabilitation medicine.

Keywords: Virtual Rehabilitation; Attitude; Physical Therapists; Occupational Therapists; Survey

INTRODUCTION

Virtual reality (VR) is a computer-generated graphical environment that allows users to view and interact with a virtual environment using a stereoscope [1]. Active video games (AVG) are a new generation of video games, requiring interactive physical activity from players [2]. Owing to advancements in display and sensor technologies, VR and AVG systems are increasingly being utilized in healthcare, including rehabilitation therapy. The applications of

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Conflict of Interest
The authors have no potential conflicts of interest to disclose.

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these technologies are wide, ranging from simple systems driven by entertainment purposes to specialized rehabilitation systems that offer greater immersion in various settings.

As the significance of the impact of VR systems on rehabilitation increases, it is important to confirm their efficacy. Previous meta-analyses targeting various patient groups have reported the positive impact of VR training on balance and gait [3-5]. As these technologies become integral to rehabilitation, understanding therapists' attitudes and factors influencing their application is crucial [6,7].

In 2013, Glegg et al. [8] developed a measurement tool based on the decomposed theory of planned behavior, which breaks down the factors influencing specific behavioral intentions to explain and predict intentions for specific behaviors, and conducted a survey of 42 therapists. Overall, the therapists had positive attitudes toward VR, perceived it as useful, and expressed their intention to utilize it more in the future. However, their self-efficacy scores were the lowest. Moreover, the study had a small sample size and the authors mentioned the need for larger, longitudinal studies, particularly for subgroup analyses based on demographic information.

In 2014, Glegg et al. [9] investigated the use of GestureTek VR (Vivid Group Inc., Toronto, Canada) in inpatient acquired brain injury rehabilitation. They found discrepancies between the clinical utilization of VR and existing published research. In particular, many patients' VR programs were discontinued early, which aligns with the documented barriers to VR use and highlighted the need for research on therapists' perceptions of VR rehabilitation therapy.

Levac et al. [6] conducted a cross-sectional survey in 2017 targeting physical therapists (PTs) and occupational therapists (OTs) in Canada to examine the actual clinical use of virtual VR and AVG, identify usage barriers and facilitators, predict factors influencing the intention to use VR/AVGs, and determine therapists' learning needs. The survey revealed that the therapists had positive attitudes toward VR, perceived its usefulness, and expressed a positive intention to use it in the future; however, results indicated a low self-efficacy regarding VR/AVG use. Time was identified as the biggest barrier to the adoption of VR/AVG, whereas social influence and knowledge were the primary facilitators of adoption.

To the best of our knowledge, no studies have been conducted on this topic in Korea. Conducting domestic research is essential to understanding the attitudes of Korean therapists toward VR and the current practices in service provision. Understanding Korean therapists' perspectives can guide knowledge-transfer interventions, such as educational outreach, and serve as a reference for policymaking in the field of rehabilitation medicine. Ultimately, a comprehensive assessment of rehabilitation therapy using VR/AVG may enhance the efficiency and accessibility of treatments and contribute to improved clinical outcomes.

In this survey, we aimed to assess the attitudes of PTs and OTs toward VR/AVG. Survey questions were structured across various domains, and additional demographic information was collected. This structured survey aimed to identify the current usage, intentions, confidence levels, as well as the supporting factors and barriers regarding VR/AVG among rehabilitation therapists.

MATERIALS AND METHODS

Survey design and participants

A nationwide survey targeting therapists (PTs and OTs) was conducted using an Internet-based survey tool. The Korean version of "ADOPT VR," a tool developed in Canada for assessing the prospective determinants of adopting VR [8], was utilized for this survey.

This survey was primarily designed for rehabilitation therapists and was conducted online via Google Forms. The survey link was shared with multiple rehabilitation therapists, and a survey announcement was made on the rehabilitation therapists' official website (https://www.kaot.org/main/index.jsp). Access was restricted to registered members certified as rehabilitation therapists. The survey was conducted from September 27, 2022, to November 9, 2022. All study participants provided informed consent and this study was approved by the Institutional Review Board (IRB) of the Seoul National University Bundang Hospital (IRB No. B-2210-785-303).

Translation and cross-cultural adaptation of the ADOPT VR2

Permission was obtained from the authors of the original ADOPT VR2 study to proceed with translation [8]. The Korean translation and cultural adaptation of ADOPT VR2 (K-ADOPT VR) took a flexible approach to the guidelines provided by the Patient-Reported Outcomes Translation and Linguistic Validation Task Force of the International Society for Pharmacoeconomics and Outcomes Research (ISPOR) [10]. The specific steps included the following: 1) forward translation, 2) reconciliation, 3) back translation and review, and 4) harmonization.

Forward translation into Korean and subsequent review for ambiguities were undertaken by 2 rehabilitation physiatrists and one PT. Any discrepancies were resolved through discussion. Back translation was performed by 2 external rehabilitation medicine physicians and one OT. All participants were blinded to the original English version of the protocol. An expert committee, consisting of translators, compared the back-translations to the original instrument for harmonization and reviewed the translations for linguistic, semantic, technical, and conceptual consistency. Following this process, the final K-ADOPT VR was established. The K-ADOPT VR is available in the **Supplementary Data 1**.

Survey questionnaire

The K-ADOPT VR evaluates factors influencing therapists' adoption of VR and identifies barriers to and facilitators of VR use. Across 13 domains with 1 to 15 questions per domain, resulting in a total of 53 questions in the survey.

The names and definitions of the 13 domains are as follows. Attitude (A) is defined as 'Therapists' general feelings about using VR as a treatment tool with their clients.' Perceived Usefulness (PU) is defined as 'Therapists' beliefs that VR is a valuable therapy tool that will enhance the treatment process for them and/or their clients and will result in improved client outcomes.' Perceived Ease of Use (PEOU) is 'Therapists' beliefs that using VR in their clinical practice will be free of effort for them.' Compatibility (C) is defined as 'The extent to which therapists believe that the use of VR as a therapy tool fits with their current treatment approaches and meets their clients' needs.' Social Norms (SN) is 'Therapists' beliefs about whether or not others think they should be using VR-based therapy.' Peer Influence (PI) is 'Therapists' beliefs about whether their colleagues think they should be using VR in their

clinical practice.' Superior Influence (SI) is 'Therapists' beliefs that their clinical supervisors expect them to use VR in clinical practice.' Client Influence (CI) is 'Therapists' beliefs that their clients expect them to use VR in clinical practice.' Perceived behavioral control (PBC) is 'Therapists' perceptions of internal and external factors affecting their ability to use VR in their practice.' Self-Efficacy (SE) is 'Therapists' beliefs that they have the personal ability to use VR as a treatment tool with their clients.' Facilitating Conditions (FC) and Barriers (B) are 'Therapists' beliefs about the influence of factors perceived to assist or limit them from using VR in their clinical practice.' Behavioral Intention (BI) is 'Therapists' intentions to use VR during treatment sessions with their clients in the future.' [8]. A 10-point Likert scale was used, where 1 indicated complete disagreement and 10 indicated complete agreement.

The therapists also reported information regarding their age, sex, educational level, profession, clinical experience, workplace type, location, position, and therapeutic area. For workplace type, the options were divided into University hospital, General hospital, Rehabilitation center, Rehabilitation hospital, Clinic, and Other. Among these options, 'Rehabilitation hospital' refers to convalescent and rehabilitation hospitals, while 'Clinic' refers to a medical institution at the clinic level (without inpatient ward), and 'Rehabilitation center' refers to welfare facilities such as public health centers, senior day care centers, or nurseries. Additionally, information on smartphone, tablet or PC, and social media usage habits was collected. The survey also included questions about the therapists' experiences with VR/AVG. VR is a computer-generated graphical environment that offers opportunities for users to view and interact with a virtual environment using a stereoscope [1]. AVG are a new generation of video games that require interactive physical activity from players [2].

Statistical analysis

A χ^2 test was conducted to examine demographic-based differences in VR/AVG experiences. For the continuous variable, age, a normality test was performed followed by the Mann-Whitney U test. For the 13 domains of attitude toward VR/AVG, normality was assessed using the Shapiro-Wilk test. Most domains did not satisfy the assumption of normality, with the no VR/AVG group showing a complete lack of normality in all domains. In the VR/AVG experience group, all domains except for PBC and FC exhibited right skewness, while in the no VR/AVG experience group, there were 7 domains with right skewness and 6 domains with left. Therefore, differences in these domains were assessed according to the VR/AVR experience using the Mann-Whitney U test. Group-specific analyses were performed separately for PTs and OTs based on their VR/AVG experience. In the PT group, both the VR/AVG and no VR/AVG experience groups exhibited normality in the FC and BI domains. Both OT groups exhibited normality in the PEOU and B domains. Therefore, t-tests were conducted for these domains, whereas the Mann-Whitney U test was conducted for the remaining domains. Score differences in the SE, FC, and B domains were identified using the Mann-Whitney U test for items not meeting normality assumptions.

Furthermore, the correlations between the average scores of the 12 domains and the average BI domain scores were examined for all participants. First, the Shapiro-Wilk test was conducted to confirm normality; all domains except for the FC domain did not meet the normality assumption (all domains except for PBC and FC exhibited right skewness, and only the PBC domain exhibited left skewness). Subsequently, the Spearman rank correlation test was used for the assessment. Further, investigations were conducted using the Spearman rank correlation test to identify significant correlations between the individual item scores of the SE, FC, and B domains and the average BI domain score.

Differences in the average BI domain scores were investigated based on the therapists' age, sex, position (practitioners, middle managers, administrators), years of work experience, and workplace location (Seoul, metropolitan city, province) using the Mann-Whitney U test or the Kruskal-Wallis test. In cases where the Kruskal-Wallis test was employed, Bonferroni correction was applied for post hoc tests. Finally, we performed multiple linear regression to predict the average BI domain scores based on the average scores of the other 12 domains, utilizing backward elimination to identify the model with the highest accuracy.

Statistical significance was set at $p < 0.05$. For Bonferroni correction, the statistical significance level was set at $p < (0.05/\text{number of groups})$ to ensure a consistent approach. The results of the survey were analyzed using the SciPy library version 1.5.2 (Enthought, Austin, TX, USA) in Python version 3.6 (PSF, Wilmington, DE, USA).

RESULTS

Participant and group analysis

A total of 350 therapists participated in the survey, comprising 191 PTs and 159 OTs. Among the participants, 184 (87 PTs and 97 OTs) reported VR/AVG experience, while 166 (104 PTs and 62 OTs) had no VR/AVG experience. The proportion of therapists with experience in VR/AVG was significantly higher in the OT group than in the PT group ($p = 0.03$). However, no significant demographic differences were found between respondents with and without VR/AVG experience (**Table 1**).

VR/AVG experience and attitude analysis

Among the 13 attitude domains toward VR/AVG, therapists with VR/AVG experience scored significantly higher in all domains except A, PU, PEOU, and CI ($p < 0.05$) (**Fig. 1**). When the analysis was conducted within the PT and OT subgroups, the PT group showed significantly

Table 1. Demographic characteristics of the respondents (n = 350)

Characteristics	VR/AVG experience group (n = 184)	No VR/AVG experience group (n = 166)	p value
Mean age (yr)	30.4 ± 7.0	30.1 ± 6.6	0.493[†]
Therapist category			< 0.001[*‡]
PT	87 (47.3)	104 (62.7)	
OT	97 (52.7)	62 (37.3)	
Sex			0.489[‡]
Male	59 (32.1)	60 (36.1)	
Years of service			0.660[‡]
Less than 2	41 (22.3)	43 (25.9)	
2–5	60 (32.6)	49 (29.5)	
6–10	41 (22.3)	36 (21.7)	
11–15	21 (11.4)	25 (15.1)	
More than 16	21 (11.4)	14 (7.8)	
Affiliations			0.351[‡]
University hospital	43 (23.4)	35 (21.1)	
General hospital	23 (12.5)	18 (10.8)	
Rehabilitation center	32 (17.4)	22 (13.3)	
Rehabilitation hospital	50 (27.2)	58 (34.9)	
Clinic	7 (3.8)	12 (7.2)	
Other	29 (15.7)	21 (12.7)	

Values are presented as mean ± standard deviation or number (%).
VR, virtual rehabilitation; AVG, active video games; PT, physical therapist; OT, occupational therapist.
[*]$p < 0.05$; [†]Mann-Whitney U test; [‡]χ^2 test.
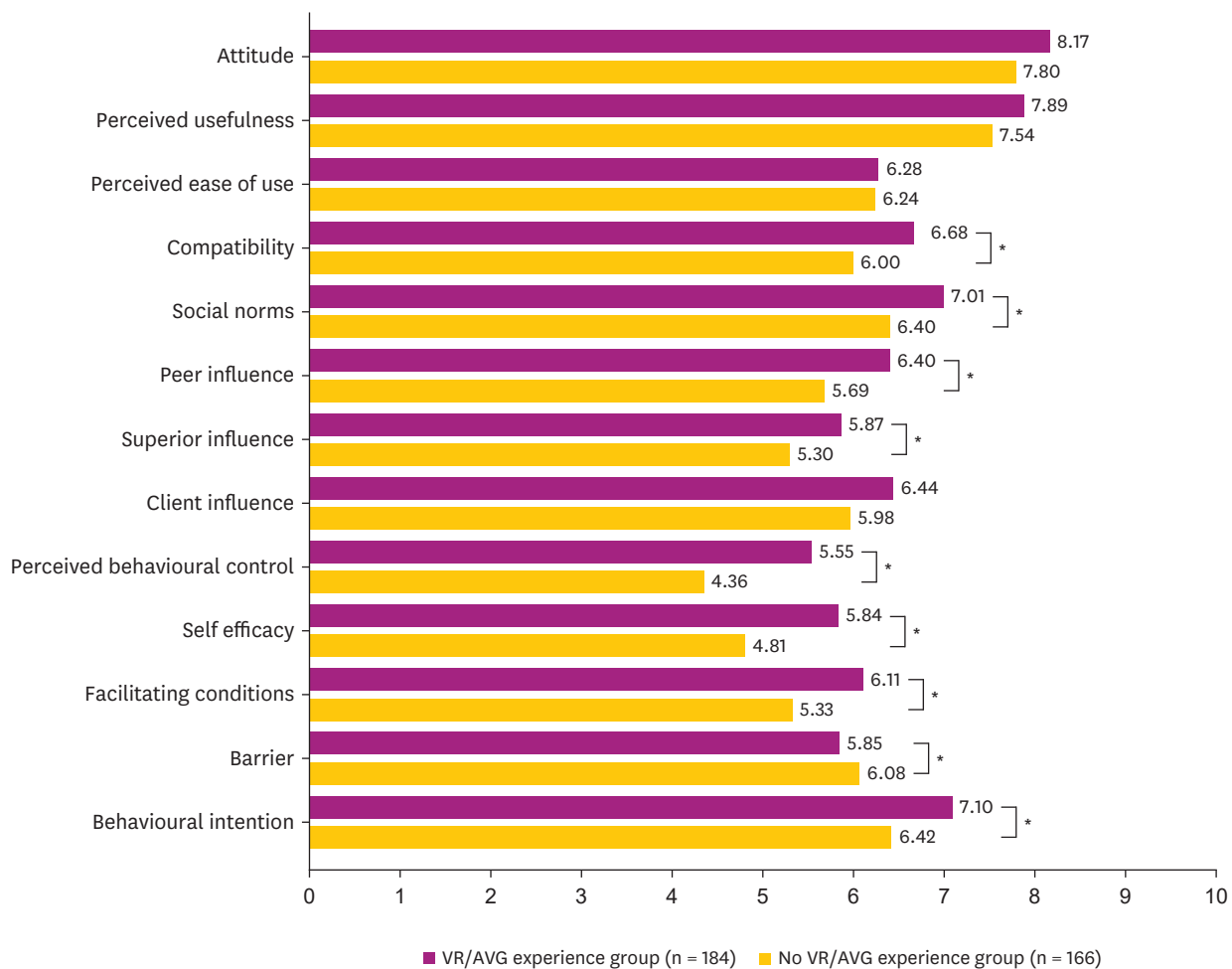
Fig. 1. Comparison of the domains according to VR/AVG experience.
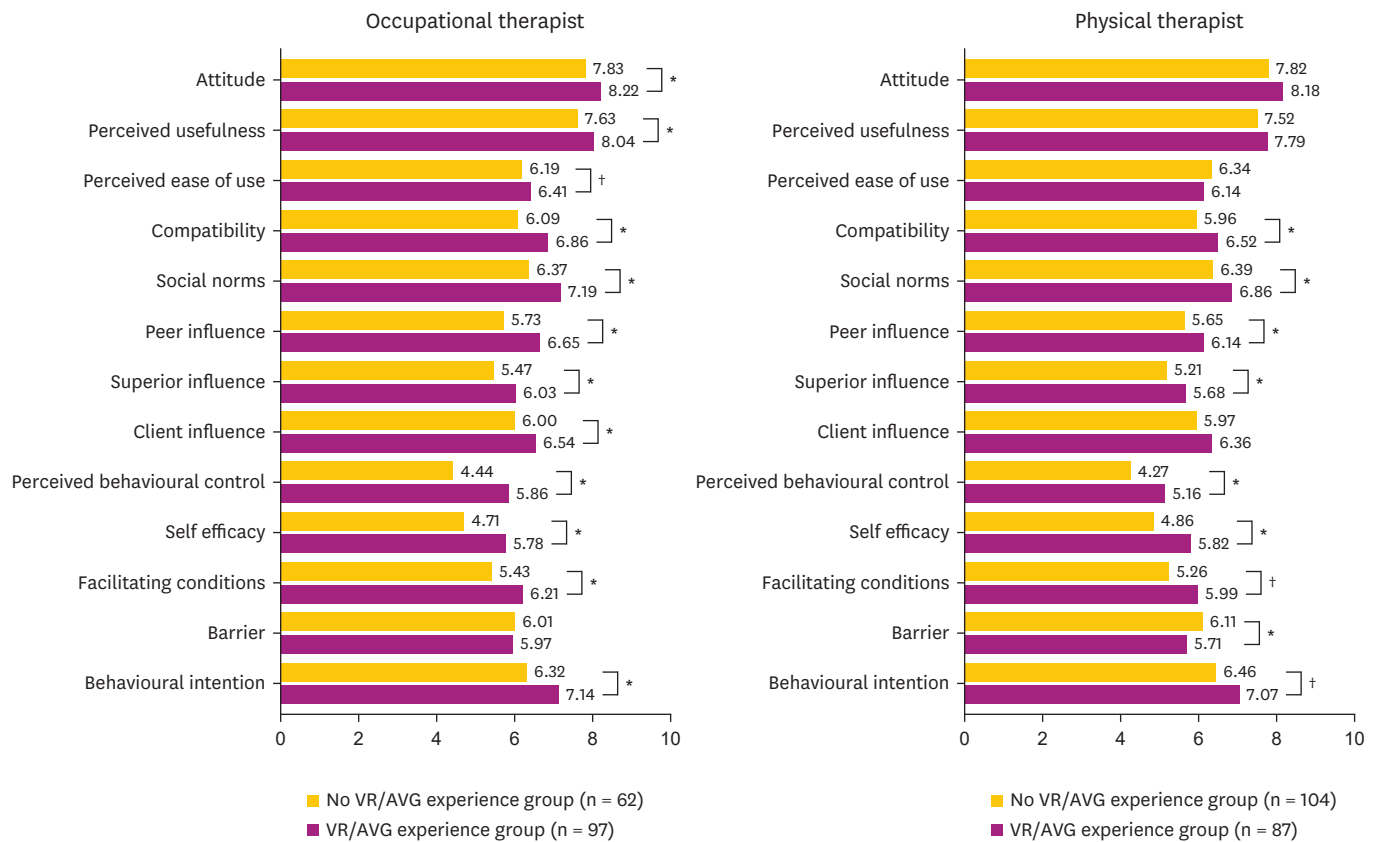VR, virtual rehabilitation; AVG, active video games.
*p < 0.05.

higher scores in all domains, except A, PU, PEOU, and CI, for therapists with VR/AVG experience. In the OT group, therapists with VR/AVG experience showed significantly higher scores in all domains except B (**Fig. 2**).

Differences between the groups with and without VR/AVG experience were examined in the SE, FC, and B domains on an item-by-item basis. In FC, there were significant differences in all items, but in B, significant differences were found only in items such as "I am not interested in using virtual reality for patient treatment" and "There are no patients in my caseload who would benefit from virtual reality" (**Fig. 3**). In SE, significant differences were found in all items (**Fig. 4**).

Correlation analysis
Correlations between the average scores of the 12 domains and the average BI domain scores for all participants were evaluated. Significant correlations were found for all items (p < 0.05), with domain B showing a negative correlation (**Table 2**).
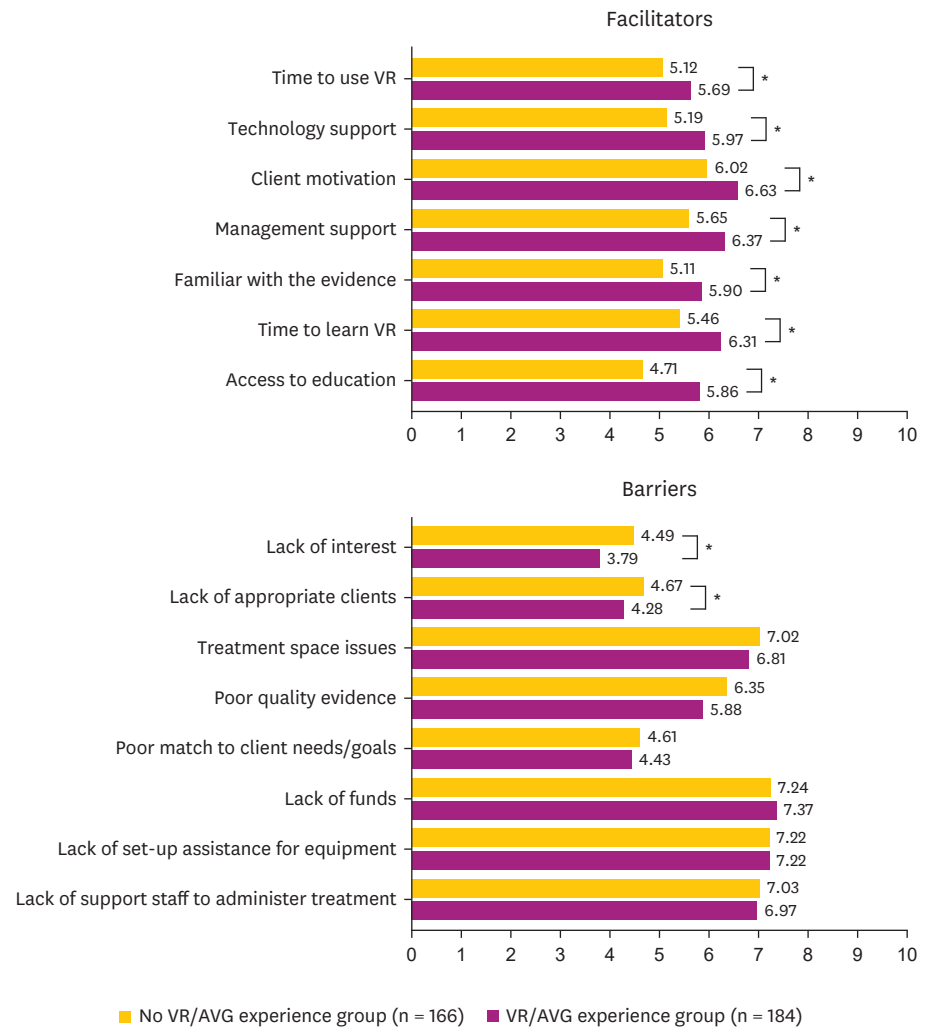
Fig. 2. Comparison of domains based on VR/AVG experience, categorized by occupational therapists and physical therapists.
VR, virtual rehabilitation; AVG, active video games.
*Mann-Whitney U test, $p < 0.05$; †T-test, $p < 0.05$.

The participants were divided into groups based on their VR/AVG experience, and correlations between the average scores of the FC and B domains and the average score of the BI domain were examined. The group with VR/AVG experience showed significant correlations between both domains and the BI domain. However, the group without VR/AVG experience exhibited a significant correlation only in the FC domain. Correlations between the scores of each item in the SE, FC, and B domains and the average BI domain scores were examined for all participants. All items in the SE and FC domains exhibited significant correlations. However, in the B domain, significant correlations were observed for the items "There is insufficient space for utilizing virtual reality" and "Additional personnel for VR equipment are needed." Moreover, there were no significant correlations observed for the items "There is insufficient clinical evidence for the use of virtual reality" and "There is a lack of financial resources to purchase the necessary equipment or software for virtual reality." This indicates that the items in the B domain did not exhibit significant associations with the overall attitudes and perceptions reflected in the BI domain.

Other demographic factor analysis

Significant differences in average BI domain scores were observed only among regions categorized as metropolitan cities, provinces, and Seoul. The difference was significant between the provinces and Seoul ($p = 0.016$), indicating a meaningful variation in the average BI domain scores between these 2 regions.
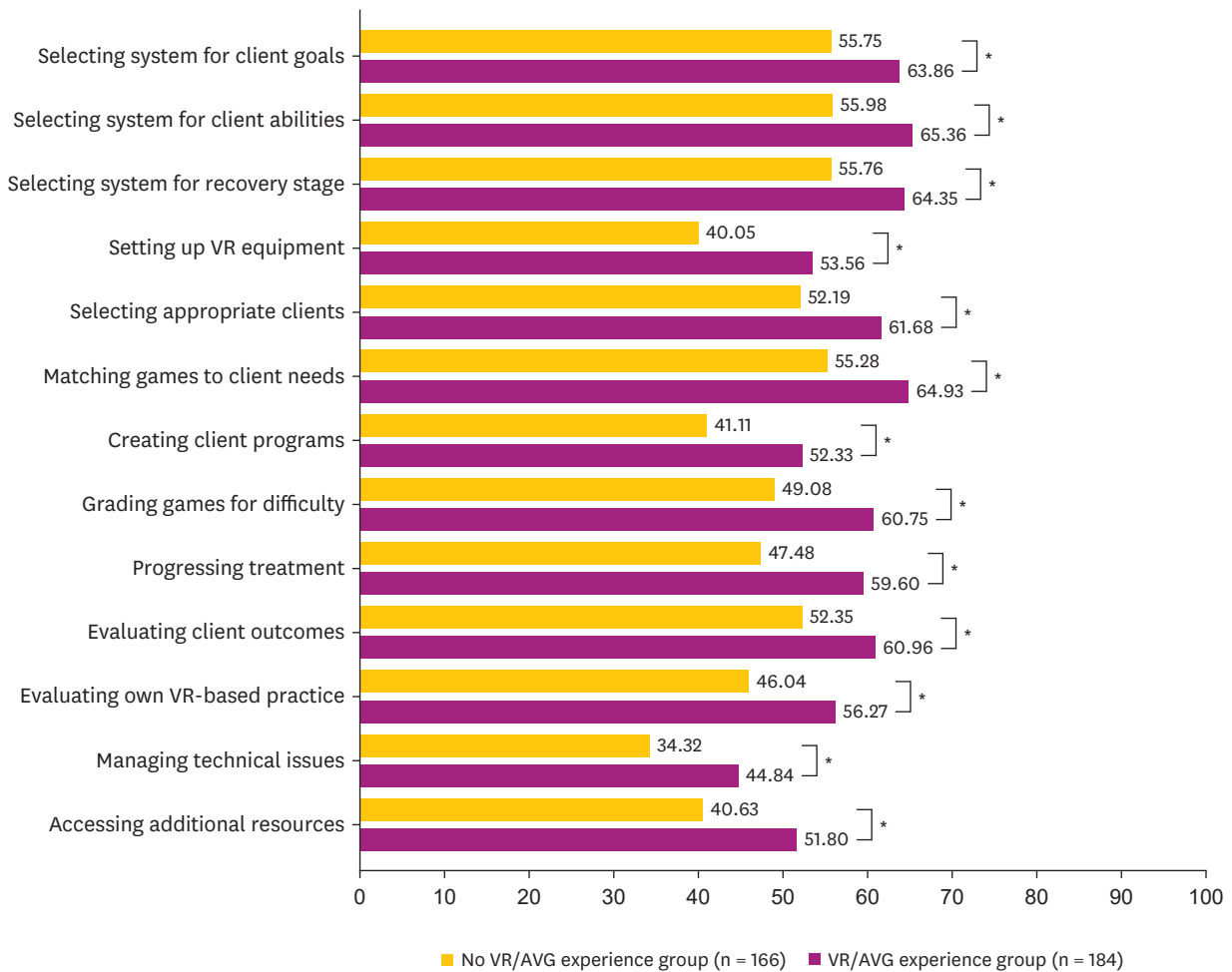
Fig. 3. Comparison of individual items within the Facilitating Conditions and Barriers domains based on VR/AVG experience.
VR, virtual rehabilitation; AVG, active video games.
*p < 0.05.

Table 2. Correlation between the Behavioral Intention domain and each domain

Domains	Correlation coefficient	p value
Attitude	0.635	< 0.001
Perceived Usefulness	0.665	< 0.001
Perceived Ease of Use	0.418	< 0.001
Compatibility	0.642	< 0.001
Social Norms	0.668	< 0.001
Client Influence	0.544	< 0.001
Peer Influence	0.521	< 0.001
Superior Influence	0.430	< 0.001
Perceived Behavioral Control	0.427	< 0.001
Self-Efficacy	0.509	< 0.001
Facilitating Conditions	0.640	< 0.001
Barriers	−0.107	0.041

Fig. 4. Comparison of individual items within Self-Efficacy domains based on VR/AVG experience.
VR, virtual rehabilitation; AVG, active video game.
*p < 0.05.

In contrast, no significant correlation was observed between age and average BI domain scores. There were no significant differences among the subgroups based on job position (practitioners, middle managers, and administrators), years of work experience (categorized as < 2 years, ≥ 2 years and < 5 years, ≥ 5 years and < 10 years, ≥ 10 years and < 15 years, and ≥ 15 years), and sex.

Multiple linear regression analysis
Multiple linear regression analysis was used to predict the average BI domain scores, employing a variable elimination method. During the optimization process, the domains of PEOU, SN, PI, SI, and B were removed due to their inability to improve the model's explanatory power. Consequently, the model including the variables of A, PU, C, CI, PBC, SE, and FC demonstrated the highest accuracy (Adjusted R^2: 0.608) (**Table 3**).

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Table 3. Result of multiple linear regression analysis for predicting average Behavioral Intentions domain scores

Independent variable	β (standardized)	Standard error	t-value	p value	VIF	Adjusted R² (p value)	Dubin-Watson
Model						0.608 (< 0.001)	1.937
Facilitating Conditions	0.319	0.052	6.448	< 0.001	2.250		
Perceived Usefulness	0.191	0.076	2.737	0.007	4.466		
Attitude	0.190	0.068	3.118	0.002	3.406		
Self-Efficacy	0.134	0.004	3.056	0.002	1.755		
Compatibility	0.128	0.049	2.317	0.021	2.787		
Client Influence	0.102	0.038	2.202	0.028	1.951		
Perceived Behavioral Control	−0.081	0.041	−1.678	0.094	2.151		

VIF, variance inflation factor.

DISCUSSION

This survey was conducted in Korea to investigate the use, attitudes, and willingness to use VR/AVGs among therapists using a multi-domain survey. This comprehensive survey offers a holistic understanding of therapists' perceptions. Notably, therapists with prior VR/AVG experience exhibited significantly more favorable attitudes toward VR/AVG, and all domains exhibited a significant correlation with the willingness to adopt these technologies in future.

The proportion of VR experience was significantly higher among OTs than among PTs. This is believed to be because occupational therapy devices are easier to manufacture, leading to wider production and distribution.

Participants in the VR/AVG experience group showed a more favorable attitude toward VR/AVGs in most domains. Particularly, there was a significant difference between the 2 groups in the BI domain, which asked about their future intentions to adopt an actual VR/AVG. This suggests that prior experience with VR/AVG significantly influences the perceptions of and willingness to use virtual rehabilitation in the future. This aligns with the results of attitude surveys conducted in other countries regarding attitudes toward VR/AVG, as well as attitude surveys conducted domestically via tele-rehabilitation [6,11].

No significant differences were observed between the VR/AVG experience and non-VR/AVG experience groups in the A, PU, PEOU, and CI domains. However, in the A and PU categories, irrespective of VR experience, the mean scores were the highest (A: 8.00, PU: 7.73). This unanimity among participants underscores a shared consensus affirming VR's suitability for rehabilitation and its therapeutic benefits to patients. The CI category, which included statements such as "Patients believe I should use VR/AVG for treatment," was perceived as somewhat distant from the therapists' attitude toward VR/AVG, given its nature of seeking patients' opinions.

Regarding barriers related to VR/AVG, both PTs and OTs, regardless of VR/AVG experience, identified lack of funds and setup assistance for equipment as the biggest barriers. This highlights the need for the development of equipment that improves support and usability to promote VR rehabilitation. Furthermore, the item with the largest difference in responses between the groups with and without VR/AVG experience was lack of interest and lack of funds, suggesting that VR/AVG experience increases the interest in applying VR/AVG for treatment while also raising awareness of cost-related issues.

We examined the correlation between the average scores of the 12 domains and the average scores of the BI domain for all participants. Significant correlations were observed for all items, with only barrier items showing a negative coefficient.

With regards to the correlation between each item in the SE, FC, and B domains and the average score of the BI domain, only the items "There is still insufficient clinical evidence for the use of virtual reality" and "There is a lack of funds to purchase the necessary equipment or software for virtual reality" in the B domain did not exhibit significant correlations. Given that these 2 items involve external factors and judgments, the likelihood of these items showing a significant association with the therapists' behavioral intentions is low.

The multiple linear regression analysis was conducted to evaluate the predictive power of each domain on BIs, and to estimate appropriate strategies for increasing behavioral intention. Model exhibited high explanatory power (Adjusted R^2: 0.608) and statistical significance ($p < 0.001$), and also showed low autocorrelation (Durbin-Watson statistic: 1.937). Among the independent variables, FC demonstrated the highest predictive power (standardized β: 0.319) for the BI domain, followed by PU (standardized β: 0.191) and A (standardized β: 0.190). These results can provide clues on what kind of environment should be provided to enhance the behavioral intention for rehabilitation treatments using VR. Additionally, as the effectiveness of VR in rehabilitation therapy is more widely reported and facilities become more common, it is expected that therapists' intention to use such treatments will increase accordingly.

The results of this study align with those of a previous study conducted by Levac et al. [6], which found that VR/AVG experiences led to positive attitudes in most domains. Additionally, economic barriers, including "treatment space issues" and "lack of funds," were identified as the major barriers. These findings are consistent with the primary barriers identified in this study.

While evidence supporting the effectiveness of VR-based therapy in stroke rehabilitation is increasing, there is a lack of educational initiatives to support clinical integration Addressing barriers and facilitators of VR use is imperative, particularly when environmental barriers to VR integration are challenging to modify. In such cases, initiatives can target modifiable barriers related to therapists' knowledge and skills [7].

In this survey, the PBC domain ("I have the knowledge required for VR/AVG") received the lowest scores regardless of VR experience, indicating the need for educational intervention. The second lowest-scoring item was in the SI domain ("My supervisor at work thinks I should use VR/AVG in therapy"), highlighting another issue related to education. However, the fact that the items in the A, BI, and PU domains received the highest scores raised expectations regarding the impact of these initiatives. Therefore, providing therapists with adequate education and support for VR-based rehabilitation devices is likely to facilitate the effective clinical integration of VR/AVG.

This study had several limitations. In this study, the Korean translation and cultural adaptation of ADOPT VR2 were conducted using only the following: 1) forward translation, 2) reconciliation, 3) back translation and review, and 4) harmonization stages, without adhering to the guidelines of the Patient-Reported Outcomes Translation and Linguistic Validation Task Force of ISPOR [10]. However, the survey targeted a group of experts, and the necessity for a full validation process was considered low, as key terms like 'VR/AVG' were used as is. Instead, the internal consistency of the survey was verified and a high level of consistency was observed (Cronbach's alpha = 0.924). The internal consistency of the items within each domain is presented in **Table 4**. Second, although there were questions about the participants' primary therapeutic areas, an analysis based on therapeutic areas was

Table 4. Internal consistency of items within each domain

Domains	Cronbach's alpha
Attitude	0.914
Perceived Usefulness	0.880
Perceived Ease of Use	0.811
Compatibility	0.894
Social Norms	0.877
Peer Influence	0.874
Superior Influence	0.753
Perceived Behavioral Control	0.905
Self-Efficacy	0.963
Facilitating Conditions	0.886
Barriers	0.736
Behavioral Intention	0.917

not conducted because many therapists are involved in various treatment areas. However, analyzing therapeutic areas can provide crucial statistical information in surveys related to therapists' attitudes toward VR and AVG. Finally, this survey did not include questions about the types or extent of VR/AVG experiences among the therapists, which hindered an in-depth analysis. VR/AVG types can be broadly categorized into rehabilitation-specific systems and commercially available products. Recent research has shown that commercially available products are more frequently used than rehabilitation-specific systems because of factors such as usability, cost, and accessibility [6]. It would be beneficial to consider these characteristics in future studies.

To the best of our knowledge, this is the first study to investigate the attitudes of rehabilitation therapists toward VR/AVG using a structured questionnaire in Korea. Notably, VR/AVG experience had a positive impact on most domains, including the BI domain. Significant correlations were observed among the SE, FC, and BI domains. The primary obstacles were the lack of funding and insufficient support for equipment setup. Furthermore, the most discernable contrast in responses between those with and without VR/AVG experience was observed in areas related to disinterest and financial constraints. The findings of this study hold significant value for predicting the acceptability of rehabilitation therapy using VR environments and contribute insights into developing conducive environments. Additionally, they serve as a basis for future rehabilitation policies pertaining to VR/AVG.

ACKNOWLEDGMENT

SUPPLEMENTARY MATERIAL

Supplementary Data 1
Korean version of ADOPT VR

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