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VR IN SOCIAL SERVICES FOR THE ELDERLY: OPPORTUNITIES AND RISKS

A.V. Karpunina [1]
Y.V. Shimanovskaya [2]
V.N. Kamenskih [3]
L.A. Kudrinskaya [4]
D.S. Bogatov [5]

[1] Russian State Social University, Moscow, Russia. karpunina@mail.ru.
[2] Russian State Social University, Moscow, Russia. ya1873@yandex.ru.
[3] Russian State Social University, Moscow, Russia. kamenskix@gmail.com.
[4] Omsk State Technical University, Omsk, Russia. kudrinskaya.l.a@mail.ru.
[5] Russian State Social University, Moscow, Russia. kamenskix@gmail.com.

Abstract: *The article presents the results of an empirical study on the opportunities of introducing virtual reality technologies into social services for the elderly conducted by the authors in 2019-2020. The authors indicate that the need to implement VR technology is determined by the changes in the worldview, lifestyle, and the role of elderly people in modern society. The authors conducted an observation and subsequent interviewing of social service clients who attended the "Virtual Tourism" classes. The study demonstrates a positive impact on the psycho-emotional state and physical well-being of the elderly. However, the authors also indicate possible risks to vision associated with heavy eye strain in the process of using VR glasses.*

Keywords*: virtual reality, VR, social services, elderly.*

INTRODUCTION

The proportion of elderly people in the population of many countries is constantly increasing. In Russia, it reaches approximately 26% of the population (Chislennost naseleniia v Rossiiskoi Federatsii, n.d.). Under the condition of every fourth person in the country being elderly, the demand for social services, their relevance and importance are also growing (Anikeeva et al., 2010). In this case, the role of innovations is great. The modern generation of "baby boomers" above the age of 60 differs from the previous "silent" generation and the established forms of social services must be adapted for their requests and needs (Anikeeva et al., 2010). In the context of the development of online services, virtual reality (VR) technologies draw interest (Garkusha, 2020). However, the

implementation of innovative technologies is a process requiring a thorough study of possible risks making forecasts of the effectiveness of the use of various innovative technologies, especially in the context of such a sensitive matter as providing social services to the elderly. The innovative nature of technology and the lack of scientific knowledge of its influence on the effectiveness of social services present a complex scientific problem determining the need for and the relevance of conducting scientific studies.

METHODS

VR in social services presents a technology of immersing a client in a virtual world meeting the laws of the real world and preserving its properties and features for it to be more easily perceived by a person through the human senses: sight, hearing, touch, etc. Achieving the required effect requires using special devices (VR helmets) (Dorozhnaia karta razvitiia "skvoznoi" tsifrovoi tekhnologii "tekhnologii virtualnoi i dopolnennoi realnosti", n.d.). The study of this technology in social services in Russia began in 2018 based on the Russian State Social University in collaboration with HTC Russia (Karpunina, 2019). In 2019, the study was conducted in the "Taganskii" social service center in Moscow. These organizations developed the methodological foundations for designing VR techniques to be used in the work of social institutions.

By 2019, VR technology had already been implemented in the "Taganskii" territorial social services center in work with the elderly as a recreational instrument. The center developed a music therapy program titled "VR concerts". An elderly person could choose the desired genre and performer, as well as the year in which the concert was held from the presented list. The list of options was quite lengthy (over 200 positions), thus, the opportunity to make a choice following one's preferences was ensured. Music therapy allows abstracting from psychological, medical, social, and other problems and experiencing physical, mental, and spiritual relaxation. The program was also quite popular among social workers in providing assistance to the elderly. However, the project team set the objectives of transferring leisure activities into the edutainment category at the first stage of the project and then introducing VR into the category of social work technologies based on an empirical study.

Data from the rare studies carried out in the field of medical rehabilitation of the elderly demonstrate that VR technology is effective, easy to use, safe, and ensures high patient satisfaction. The analyzes vary in terms of quality but no association has been found between the nature of the studies and their key outcomes. In most cases, the participants found the VR experience immersive and enjoyable with very few of them being disappointed due to side effects (headaches, nausea, dizziness) (Charissis et al., 2008; Slavin, Grin, 2019). The main hypothesis of the present study states that the implementation of VR in social work with elderly people will be highly effective. Such a technology can be called "VR therapy" – a process capable of exerting psychological influence on a client through the means of deliberate immersion into a virtual world (Zaika, Perepelina, 2020).

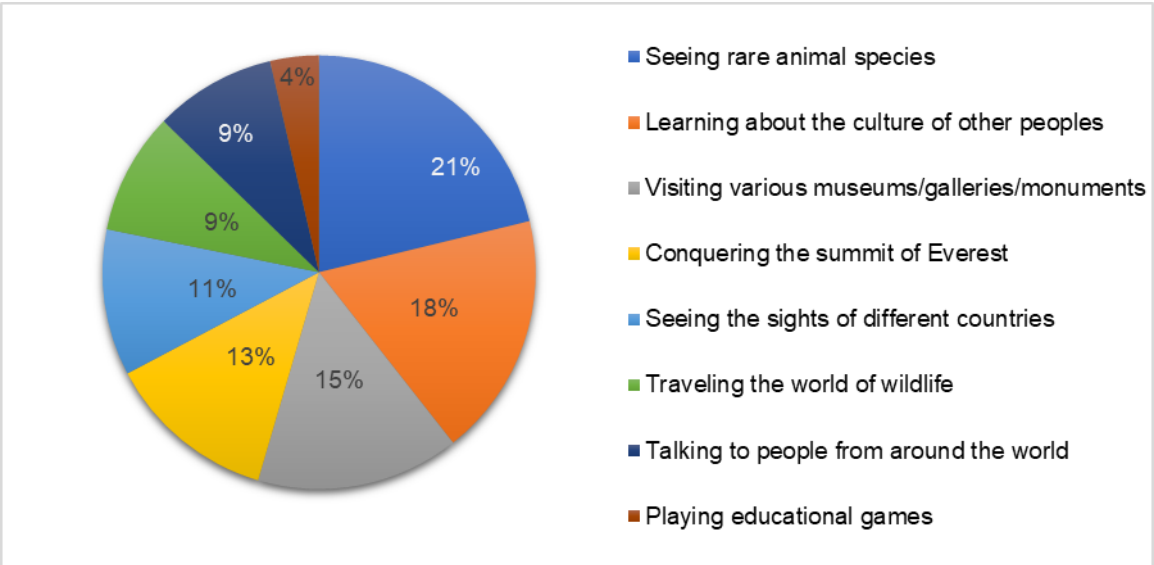
The pilot project took the form of virtual tourism, a direction of work implemented in several organizations in Russia. Its approbation involved 35 elderly people aged from 60 to 71 years old (the average age – 65.89 years old), 71.4% of whom were female and 28.6% were male, and all of them represented the clients of the department of social communications and active longevity. The goal of virtual tourism lies not only in

entertainment but also in preventing social, psychological, and medical risks (Diakonova, 2020). The implementation of the project started in August of 2019.

The "Virtual tourism" project used VR maps of Russian cities and foreign countries. The programs were selected in a way that ensured that the elderly were not merely passive but active participants in the process taking place and were able to interact with the surrounding environment and personally affect the course of the travel. The movement across the map was accompanied by the motor activity of the arms, head, neck, and body. The elderly people had to make step movements forward/backward/to the side. During VR immersion sessions, a specially trained volunteer was constantly present next to the clients. Empirical data were collected after three tourism sessions using the semi-formalized interview method. The respondents were asked 20 questions including socio-demographic. Surveying one client took no more than 15 minutes. The sample size is insufficient (N = 35); the present study is of a probing nature and only allows for preliminary conclusions to be drawn.

RESULTS

The respondents' answers to direct questions about their satisfaction were unanimous: 100% of them noted that they "really liked" the tourism sessions; all respondents reported improved mood and getting positive emotions after the classes. The average rating of the degree to which the classes were interesting was 8.97 on a 10-point scale (mode – 10, minimum – 7). The analysis of the respondents' answers to the question "What seemed to you the most interesting in VR traveling?" showed that the elderly were most interested in activities associated with learning something new. The elderly primarily wanted to see or do something previously unavailable to them, for example, explore the nature or culture of other countries, visit museums, or see rare paintings. The least number of the elderly were interested in the gaming elements (35 of the respondents) (Figure 1).



Note: Polyvariant question, the average number of responses per respondent equals 4.7.
Figure 1. Distribution of the respondents' answers to the question "What seemed to you the most interesting in VR traveling?"

Even though 91.4% of the respondents had had no experience in using VR technology before the classes, 100% of them indicated that it had only taken them one class to become familiar with the virtual environment which is associated with interface usability, mandatory training preceding the first session, and the presence of a volunteer who provided constant support to the clients. The elderly people were noted to become more active in the process of interaction and demonstrated interest and cognitive activity. They willingly responded to the "memory and attention training, prevention of dementia" stimulus and readily performed simple tasks during the sessions.

One of the study hypotheses assumed possible negative effects due to the characteristics of old age. In the first session, about 40% of the respondents complained of dizziness during the session, especially when turning the body or throwing their head back. This rate is quite high which indicates the need for VR to be used carefully in work with the elderly. The project team even had the impression that such activities were not suitable for the elderly in general. However, by the second session complaints of dizziness had become two times less frequent. After the third session, almost all clients noted that dizziness became less frequent in everyday life as well. It is possible that VR can serve as a physiological therapy instrument, although such conclusions call for large-scale studies.

Aside from dizziness, 11.4% of the respondents indicated experiencing fatigue in the eyes and difficulty focusing during VR training which persisted for all three sessions. It was these clients who later provided lower estimates of the effectiveness of the classes. 88.6% of the respondents did not notice any problems with vision during training. The analysis of answers to circumstantial questions also indicates a high level of satisfaction with the lessons. Most elderly people expressed a desire to continue and repeat these activities in the future. All respondents reported that they would recommend attending VR lessons to their relatives and friends.

When asked what they would like to change in the project, the seniors replied that each lesson should be conducted using a new VR map. They considered visiting the same places again "uninteresting" and even if some places on the map had been left undiscovered, they only agreed to use it if there were no new maps. These responses demonstrate a clear desire for new experiences among the baby boomer generation, as well as the fact that the introduction of VR into the social sphere was quite effective and aroused interest among the elderly. However, it is crucial to prevent the monotony of VR programs used in the project which can make people grow bored with VR. Although the effectiveness of VR technology has been confirmed, there are still ways to improve it to avoid stagnation of application and annoyance at them. Nevertheless, increased attention should be paid to the safety of the technology for the health of older users.

Another one of the study hypotheses was an assumption about the positive impact of virtual tourism on the psychological state of the social center clients. However, the conditions of the center did not allow for a comprehensive study. Therefore, the assessment was carried out only based on M. Luscher's Color Test, which is not valid, and the results of which can only be considered a prerequisite for a rigorous assessment of changes in the psychological state. Our study used L.N. Sobchik's eight-color adaptation of the test. In addition, the psychologist of the center used the "Self-assessment of Emotional States" method (A. Wessmann and D. Ricks) composed of four scales: "calmness – anxiety", "vigor – tiredness", "high spirits – low spirits", and "self-confidence – lack of self-confidence". The method was used to assess the emotional and personal sphere of the elderly, the dynamic of the changes in their mood immediately before and

after the session, as well as for the self-assessment of the emotional state of the elderly people.

The psychodiagnostic instruments showed that on the first day before the class, the elderly demonstrated anxiety, tension, and negativism. The results of the second round of testing conducted immediately after the session did not differ from the initial ones significantly but were still somewhat better (on average, the score increased by 4-5 points). Starting from the subsequent lessons, the harmonization of the color range was noted and persisted throughout the course. The stress was less pronounced and the discrepancy between the choices was observed less often. After the third session, the positive dynamics in the self-assessment of the emotional states of the elderly were evident. Based on the results of psychological observation, we can draw a preliminary conclusion that the "Virtual Tourism" project has a beneficial effect on the emotional sphere of the elderly. The overall mood improves, and their self-esteem increases due to interaction with modern technologies. However, the anxiety level can rise at the beginning of the lessons which calls for mandatory supervision by a specialist or a volunteer.

DISCUSSION

VR in social work is a promising area that needs to be developed further. Our project brought variety to the work of the center and was enjoyed by both the social workers and the clients. The project started in August 2019 and was completed for the control group in December of the same year. As a result of the project, it was decided to increase the number of virtual maps and develop new applications for work with the elderly. Having proven itself effective, the project was introduced into the work of the center as a regular service for the elderly in January 2020. However, in March 2020 all projects of the center including VR tourism were suspended due to the institution being temporarily closed although it had become quite apparent that VR can become a great instrument for social rehabilitation, adaptation, and therapy. However, continuing to use it requires the equipment to be installed in clients' apartments (the cost of one set of equipment ranges from 500 to 1,500 euros). The high cost of the equipment and its installation and the need for assistance do not yet allow VR technology to be rapidly implemented in social services. The question of the legal protection of developments also remains open (Ruzakova, Grin, 2020). However, their use provides practically unlimited opportunities for virtual training, walks, communication, classes, and leisure and prevents hypodynamia and dementia which is especially relevant in the conditions of the pandemic. Nevertheless, even after the restrictions associated with the pandemic are lifted, elderly people with limited mobility who rarely or almost never leave their homes will remain in their homes. Due to being restricted in active movement, they are unable to take part in active cultural and leisure activities such as excursion trips, mass festive events, etc. These people experience the highest degree of social exclusion. In this context, VR presents a simple and effective way of overcoming said exclusion.

CONCLUSION

The use of the means of VR in social services proves itself effective for senior citizens. The realized "Virtual Tourism" project allowed us to identify the following positive results: physiological: cessation of dizziness, increased physical activity;

emotional: elimination of anxiety, improvement of the psycho-emotional state, enhancement of cognitive functions. Nonetheless, the implementation of VR technology is associated with two significant risks: the high costs and possible problems with vision. The first group of risks calls for the attention of the state and businesses to the social problems of the elderly. The second group of risks requires social, medical, psychological, and pedagogical research to be conducted.

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