RE COM MIT

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Quantitative Data Collection and Analysis Detainees

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CONTENT

Introduction

Pre-release inmates who participated as trainees in the RECOMMIT program were asked to complete a series of questionnaires before the training, during, the final session, and at a 2-week follow-up. The selected questionnaires reflected the program's aims by including measures of progress and obstruction towards one's values, endorsement of prosocial or work values, perceived stress, interpersonal skills, technology acceptance, and knowledge. Bioethical permission for data collection was received from the University of Oradea's Ethical Committee.

Participants

73 participants took part in the study, 49 of whom were male (Mean Age = 36.04) and 20 of whom were female (MA = 34.45). 2 participants did not wish to respond to the survey at all, and 1 participant did not consent to provide data. 4 participants were from Cyprus, 22 were from Greece, 20 were from Romania and 27 from Spain. 39 participants reported having been in full-time employment in the past year, 8 reported part-time employment, 9 reported that they did not hold employment for longer than 1 year, 4 reported working remotely in the past year and 4 reported being only a student in the past year. 9 participants did not report any employment background. Most participants reported their primary languages and country of residence being Greek (N = 20), Spanish (N = 17) and Romanian (N = 15). 5 participants reported having served 5 months to a year of custodial sentence length, 13 participants reported 13 months to 2 years, 10 reported 25 months to 3 years, 11 reported 37 months to 5 years, 5 reported 49 months to 5 years and 26 reported over a 5-year sentence. 3 individuals did not report custodial length. 48 individuals reported that their current sentence was their first offense whereas 23 individuals reported that they had previous sentences. 2 Individuals did not report any information regarding the timing of their custodial sentence.

Materials

Participants were asked to complete the following questionnaire during their participation:

Perceived Stress Scale (SS-4 – Cohen, Kamarck & Mermelstein, 1983)

The original instrument consisted of 14 items, and it was used as an attempt to create an instrument to measure stress. Cohen et al., 1983 suggested also a 4-item version of the scale with satisfactory results (a = .84, .85 and .86 on 3 different samples, N = 473). The short version of the scale consists of 4 different questions on a 5-item Likert Scale (0 = Never – 4 = Very Often) and higher scores indicate higher stress levels. 2 positive working items are reverse scored. The scale is commonly used with satisfactory results (i.e. Ingram, Clarke & Lichtenberg, 2016).

Knowledge Assessment

The knowledge assessment was developed to test the knowledge acquired by participants during their training phase in relation to the concepts introduced in the training protocol. The survey consisted of 11 multiple-choice questions and each correct answer was scored as equal to 1 point. Scores were then summed up for each phase of the assessment. Due to many data missing in the dataset on this measure, participants who did not provide any answers before the training were excluded from this analysis. To manage missing data from participants who provided a response before the training but missed out on one of the next measurements, we used the last observation carried forward methodology to complete our analyses.

Interpersonal Skills Questionnaire (Coroiu et al., 2015)

The ICQ was developed originally in the late 80s (as cited Coroiu et al., 2015), and it was constructed to measure social competence and how well an individual interacts with their everyday social and interpersonal life. The questionnaire consists of 5 sub-scales measuring difference aspects of social competence (initiation of relationships, negative assertion, disclosure of personal information, emotional support and conflict management) on a 4-item Likert scale (1 = I'm always poor at this - 4= I'm always good at this). The scale scored satisfactory Cronbach's a value (a = .61 - .75).

Valuing Questionnaire (VQ - Smout et al., 2014)

The Valuing Questionnaire Consists of 10 individual items on a 7 item Likert scale (0 = Not at all true – 6 = Completely True). The survey measures if an individual enacts upon their values as defined according to the Acceptance and Commitment model and Interventions (Hayes et al., 2011). The scale consists of 2 sub-scales, Obstruction (measures if an individual behaves in opposition to their values) and Progress (measures if an individual behaves in concordance with their values), each of which contains 5 items. The survey has been widely used and has shown promising results in both in the original paper (a = .81 - .88) and other citations (i.e. Carvalho et al., 2018).

Pro-social and Work Values

Participants were asked the extent to which they endorsed the following values in their personal life: Self-care, connecting with others, helping others, working hard, responsibility, connecting with the present moment, now.

Technology Acceptance

At the conclusion of the training sessions using VR, participants completed a questionnaire assessing various constructs related to their experience. These included traditional Technology Acceptance Model (TAM) factors—such as Perceived Enjoyment (PE), Perceived Ease of Use (PEOU), and Perceived Usefulness (PU)—as well as Attitudes Toward Using (ATU) and Behavioral Intention to Use (BITU). In addition, VR-specific factors were measured: Immersion (IMRSN), Computer Anxiety (CANX), and VR Sickness (VRS). Below is a descriptive overview of these results, focusing on the central tendencies and distributions of the collected data. The scales were measured on a Likert-type scale ranging from 1-7.

Procedure

The RECOMMIT project was delivered in 4 different European countries: Cyprus, Romania, Spain and Greece. The project consisted of 10 different modules delivered in a 3-month period. Participants were asked to complete questionnaires at 4 different times at the beginning of module 1, during the review module (8), at the final module (10) and then at follow-up.

Results

Attitude and knowledge outcomes

Perceived Stress Scale (SS-4 – Cohen, Kamarck & Mermelstein, 1983)

The distribution of the perceived stress scale was relatively normal and appropriate for statistical analyses. Participants experienced a significant decrease in their perceived stress levels as a result of participating in the RECOMMIT program as shown in Table 1. This decrease was also statistically

significant as evidenced by repeated measures ANOVA and using the Sphericity Assumed function, F (3, 99) = 3, p= .034.

Table 1. Means of Perceived Stress Scale.

	N	Mean	Std. Deviation
	Statistic	Statistic	Statistic
Pre PSS	56	7.1964	2.35426
During PSS	39	6.1026	2.47933
Post PSS	42	5.8810	3.10941
Follow-up PSS	36	5.8611	3.34794

Knowledge Assessment

Knowledge increased over time. Knowledge was measured before the intervention, during, and at follow-up. Means and normality statistics are shown in Table 2. Interestingly, knowledge was already quite high even before the training with a mean of 8.32 (SD=2.32) out of a possible total of 12. Nonetheless, repeated measures ANOVA also indicated a small but significant increase in knowledge over time, Sphericity Assumed, F (2, 110) = 5.83, p = .004.

Table 2. Means of Knowledge assessment

		Pre Knowledge total	During Knowledge total	Follow-up knowledge total
N	Valid	57	57	56
	Missing	0	0	1
Mean		8.3158	8.7895	8.7857
Std. Deviation		2.31577	2.28142	2.31763

Interpersonal Skills Questionnaire (Coroiu et al., 2015)

As predicted, interpersonal skills also improved as a result of the RECOMMIT program. Despite a drop in interpersonal skills during the program (which may reflect a growing awareness of individuals regarding their lack of interpersonal skills), by the end of the program participants increased in their perceived interpersonal skills. Table 3 shows the means of the interpersonal scale over time. A repeated measures ANOVA indicated this improvement using the Sphericity Assumed correction, $F(3, 66) = 22.85$, $p<.001$

Table 3. Means of Interpersonal Skills Scale

		Pre_Interper	During_Interper	Post_Interper	Follow_Interper
N	Valid	39	41	41	37
	Missing	18	16	16	20
Mean		14.3932	12.6829	15.3089	15.6396
Std. Deviation		1.82393	1.97337	2.54885	2.15507

Valuing Questionnaire (VQ - Smout et al., 2014)

According to expectations, this scale indicated a reduction in obstruction (difficulty) towards acting on important values after the training. Table 4 shows the means over time. A significant shift over time is found when comparing scores before the training and after the training using a paired samples t-test analysis, $T(40) = 2.47$, $p=.005$.

Table 4. Means of Valuing Obstruction

		VQ Obstr PRE	VQ Obstr DURING	VQ Obstr POST	VQ Obstr FOLLOWUP
N	Valid	55	41	43	41
Mean		15.5273	13.3415	12.1395	13.0244
Std. Deviation		7.72886	7.67662	8.42779	8.58629

Pro-social and Work Values

Pro-social and work values were reported as high even before the initiation of the training, thus allowing little space for observing a change. On a scale from 4 to 40 participants scored a mean of 34.47 on the prosocial values (SD= 5.81) and on work values on a scale from 2 to 20 a mean of 17.91 (SD = 3.19).

Technology Acceptance Outcomes

Participants generally positively rated the VR experience, reflected by high mean scores. They found VR fun to use (M=5.84, SD=1.45), pleasant (M=5.62, SD=1.44), and enjoyable (M=5.59, SD=1.42). The experience was also described as interesting (M=6.24, SD=1.05), and many expressed a willingness to repeat it (M=5.53, SD=1.87), and the majority strongly agreed that they were unhappy when the sessions ended (M=5.07, SD=1.95). Learning to use the system was perceived as relatively easy (M=5.52, SD=1.48), and participants found themselves able to become skillful (M=5.30, SD=1.57) and achieve their desired outcomes (M=5.33, SD=1.47). Participants agreed that VR enhanced their understanding of reintegration training concepts (M=5.49, SD=1.51) and made the process easier (M=5.20, SD=1.71), with an overall perception that using VR for reintegration is a good (M=5.68, SD=1.72) and wise idea (M=5.57, SD=1.61). Additionally, participants reported positive intentions toward using VR in prisons (M=5.90, SD=1.41) and for other training purposes (M=5.97, SD=1.27).

Participants revealed high immersion levels (M=5.17, SD=1.84) and fully engaged (M=4.96, SD=1.68) at slightly lower levels. Participants felt that they were part pf the VR learning environment (M=5.4, SD=1.67), VR did not induce much fear (M=5.93, SD=1.66), discomfort was generally low (M=5.46, SD=1.77), did not made them nervous (M=5.73, SD=1.62), and made them feel ease (M=5.4, SD=2.07).

Regarding VR sickness symptoms, the descriptive statistics indicate that participants experienced relatively low levels of discomfort and symptoms, although variability in responses was notable. General discomfort (M=2.80, SD=2.16) and fatigue (M=2.71, SD=1.93) were reported at similar levels, as were eyestrain (M=2.89, SD=2.14) and difficulty focusing (M=2.70, SD=2.07). More specific symptoms such as headache (M=2.55, SD=2.05) and a sense of fullness in the head (M=2.53, SD=2.00) were slightly lower but still present. Blurred vision (M=3.24, SD=2.48) was slightly higher than other symptoms, suggesting it may have been a more prominent issue for some participants. Reports of dizziness with eyes closed (M=2.71, SD=2.08) and vertigo (M=2.76, SD=2.20) were also relatively low but consistent with the general pattern of mild symptoms. The standard deviations across all symptoms indicate a wide range of experiences among participants, with some reporting no symptoms at all while others reported higher levels of discomfort.

Overall, participants reported high levels of Perceived Enjoyment, (PE, mean = 5.65, SD = 1.16) indicating that most found the VR experience enjoyable. Perceived Ease of Use (PEOU) had a mean of 5.39 (SD = 1.4, suggesting that, while generally positive, perceptions of how easy the VR system was to

use varied slightly more among participants. Perceived Usefulness (PU, mean = 5.4,1 SD = 1.4) and Attitudes Toward Using (ATT, Mean = 5.62, SD =1.37) are also clustered towards the upper end of the response scale, suggesting that participants found the VR training useful and beneficial and also developed favorable attitudes towards using it for their rehabilitation activities. Similarly, perceptions toward Behavioral Intentions to Use (BITU, mean = 5.71, SD = 1.4) were generally strong, reflecting a willingness to adopt the VR system for training purposes. Participants further reported a high level of Immersion (IMRSN, mean = 5.12, SD = 1.43) suggesting that the VR environment successfully engaged their attention. In terms of comfort and confidence with the technology, Computer Anxiety scores were mainly low (CANX, Mean = 2.38, SD = 1.4). VR Sickness (VRS), with a mean 2.79 (SD = 1.7), indicated that symptoms such as dizziness or nausea were present but not severe for most participants. 21.8% of participants reported almost no sickness symptoms, and just a small minority reported higher levels of discomfort (scores approaching 7.00).

Discussion

The results indicated a successful implementation of the RECOMMIT program with some observable beneficial impact on the participants on measures of mental health, values, knowledge, interpersonal skills and technology acceptance. One limitation included the loss of data over time and the lack of a comparison group which decreased some of our confidence in the results. However, the consistent changes and impact of the training across all outcomes increased our confidence that the intervention did have an impact on participants. The loss of data over time is a common disadvantage of implementing programs in a prison setting where people dislike completing questionnaires, may discontinue or miss sessions due to administrative or legal issues or may refuse to complete questionnaires due to privacy concerns. Nonetheless, the results show that RECOMMIT is a promising intervention for prison settings as it has the potential of increasing important outcomes that may support people in their return-to-work post-release.

Regarding attitude and knowledge outcomes most of our expectations materialized in the results. Although not part of explicit program goals, participants experienced a marked reduction in their stress because of the training. The training includes some explicit techniques for self-awareness (mindfulness) which has been shown to reduce stress in prior studies and it seems that this finding was replicated in this population also. Moreover, reductions in stress may also be the function of participants feeling that there were reductions in the obstructions (perceived barriers) to acting in accordance with their values.

The most important finding and consistent with training goals was the increase in interpersonal skills. This finding may illustrate that this type of training inclusive of immersive content and in-class role-plays can increase interpersonal skills. Moreover, the improvement of these skills during the training may have also led to improvement in perceived stress as a side effect of better in-prison communication. Surprisingly, initial knowledge was also quite high among trainees, introducing the possibility that the knowledge questions selected may have been easier than originally thought. Cross-discussions among the team in selecting knowledge questions led us to underestimate the knowledge of the pre-release inmate participants. Moreover, despite a high initial level of knowledge, our results still indicated a small increase in knowledge as a result of the program, as expected.

Regarding technology acceptance outcomes, the results indicate that VR-based offender reintegration training has strong potential as an immersive and acceptable method for skill development, behavioural modelling, and preparing individuals for life outside of correctional facilities. High levels of enjoyment and perceived usefulness suggest that participants are willing to use VR tools and found them valuable for their training. This positive reception may increase the likelihood that the training content will be better retained and that participants will be more motivated to apply learned skills upon release.

The reported immersion levels show that the VR environment effectively captures users' attention. Immersion is a key ingredient in experiential learning, as it helps participants practice realistic scenarios in a safe setting, thus increasing the relevance and applicability of the training. Low levels of computer anxiety are particularly encouraging, as they suggest that fears or apprehensions about using new technology may not be a major barrier in this context. This is critical for scaling VR interventions across different facilities and populations, as it reduces the need for extensive technical support or intensive training on the equipment itself. While some participants reported mild VR sickness, the relatively low incidence and severity of these symptoms indicates that for most users the experience was comfortable. Nevertheless, even mild VR sickness should be addressed by optimizing hardware and software configurations.

Our findings have practical implications for correctional practitioners, policymakers, and program designers. The high levels of enjoyment, perceived usefulness, and immersion, combined with low computer anxiety, provide a strong foundation for integrating VR solutions into existing rehabilitation curricula. Addressing mild VR sickness and continuously refining VR content can support the learning experience and outcomes.

These results may open doors for the adoption of VR in other specialized training contexts within the criminal justice system, ranging from staff training to intervention programs and beyond. As VR

technology continues to mature, such positive indications from descriptive measures can guide more advanced research, support evidence-based policymaking, and ultimately improve the quality and effectiveness of rehabilitation efforts.

In conclusion, RECOMMIT was a powerful combination of an evidence-based model such as Acceptance and Commitment therapy with VR to engage, teach, and transform psychological outcomes in pre-release inmates across 4 European countries. Despite limitations in data loss over time, the findings indicate that combining evidence-based methods with technological advancements may have a powerful impact in educational programs, even in hard-to-reach and hard to engage populations.

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