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RELATION BETWEEN RESILIENCE AND CIGARETTE/ALCOHOL USE IN ADOLESCENTS WITH MILD INTELLECTUAL DISABILITY

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Short title: RESILIENCE AND CIGARETTE/ALCOHOL USE

Individual contribution of co-authors:
Abstract

Introduction/Aim. Resilience is related to the substance use (SU) in adolescence. However, little is known about the nature of this relation in adolescents with intellectual disability (ID). The aim of this research was to determine the relation between three domains of resilience (sense of mastery, sense of relatedness, and emotional reactivity) and the SU (cigarettes, alcohol, and marijuana) in adolescents with ID. Methods. The sample consisted of 100 adolescents with mild ID, 13-20 years of age, of both genders. Resiliency Scales for Children and Adolescents were used to assess resilience. Results. In adolescents with ID, resilience was significantly related to the use of cigarettes (Chi-square = 13.384; df = 3; p = 0.004), but not to the use of alcohol (Chi-square = 6.789; df =3; p > 0.05). Out of the three assessed domains of resilience, increased emotional reactivity was the only significant predictor of cigarette use. Conclusion. The obtained results suggest that emotional difficulties may increase the risk of cigarette use in adolescents with ID.

Key words: adolescents, alcohol, cigarettes, intellectual disability, resilience

Apstrakt

Uvod/Cilj. Rezilijentnost je povezana sa upotrebom psihoaktivnih supstanci u adolescenciji, ali malo se zna o prirodi ove veze kod adolescenata sa intelektualnom ometenošću (IO). Cilj istraživanja je utvrđivanje povezanosti između tri domena rezilijentnosti (osećanja kontrole nad vlastitim životom, osećanja povezanosti i emocionalne reaktivnosti) i upotrebe cigareta i alkohola kod adolescenata sa IO. Metode. Uzorak čini 100 adolescenata sa IO uzrasta 13-20 godina, oba pola. Za procenu rezilijentnosti korišćene su Skale rezilijentnosti za decu i adolescente (Resiliency Scales for Children and Adolescents). Rezultati. Kod adolescenata sa IO rezilijentnost je značajno povezana sa upotrebom cigareta (χ^2 = 13,384; df = 3; p = 0,004), ali ne i sa upotrebom alkohola (χ^2 = 6,789; df =3; p > 0,05). Od tri ispitana domena rezilijentnosti, samo je povišena emocionalna reaktivnost značajan prediktor upotrebe cigareta. Zaključak. Dobijeni rezultati sugerišu da emocionalne teškoće mogu povećati rizik upotrebe cigareta kod adolescenata sa IO.

Ključne reči: adolescenti, alkohol, cigarete, intelektualna ometenost, rezilijentnost
Introduction

The study of resilience has a relatively long history which began by identifying the characteristics of resilient children, i.e. the characteristics which can account for individual differences in withstanding and recovering from stressful situations. The concept of resilience has developed over time, and researchers’ attention has also been directed at understanding the processes which lead to successful adaptation despite adversity and traumas. Contemporary literature provides an even broader definition of resilience: “the capacity of dynamic system to withstand or recover from significant threats to its stability, viability or development.” Regardless of the described changes in the conceptualization of resilience, the interest in individual characteristics which contribute to positive developmental outcomes has been sustained up to the present time. According to authors who follow this course of research, resilience “embodies the personal qualities that enable one to thrive in the face of adversity.” Resilience is believed to be a multidimensional construct which includes some characteristics of temperament and personality, and also specific skills which enable an individual to successfully overcome life difficulties.

The main focus of this paper are domains of resilience distinguished and described by Prince-Embury: sense of mastery, sense of relatedness, and emotional reactivity. Sense of mastery includes three individual qualities: optimism as a positive attitude towards the world, one’s own life, and the future, self-efficacy i.e. confidence in one’s own abilities, and adaptability which involves openness to criticism and the ability to learn from one’s own mistakes. Individual qualities included in the sense of relatedness are: sense of trust, perceived access to support, comfort with others, and tolerance of differences. Emotional reactivity includes sensitivity, i.e. speed and intensity of an emotional response, and two constructs which represent the outcomes of emotional regulation – recovery and impairment after emotional excitement.

Research on the relation between thus conceptualized resilience and the substance use (SU) in general population of adolescents reveals that sense of mastery and sense of relatedness negatively correlate, while emotional reactivity positively correlates with the SU. Apart from that, literature on the role of described individual qualities of resilience in the occurrence and the development of SU in typically developing adolescents is extensive. With regard to sense of mastery, research results suggest that the SU is related to a lower level of self-efficacy, optimism and adaptability. Results of studies on the second domain of resilience, sense of relatedness, indicate that relationship with parents.
negatively correlates with the SU \textsuperscript{20-22}, but that relationship with peers may have the opposite effect \textsuperscript{23-25}. Finally, numerous authors associate the SU with emotional reactivity, i.e. with difficulties in experiencing and regulating emotions \textsuperscript{26-28}.

The relation between resilience and the SU in general population of adolescents has been well researched. However, little attention has been given to studying this relation in adolescents with intellectual disability (ID). On the other hand, the results of previous studies have confirmed that many adolescents with ID have experience with the use of cigarettes, alcohol, and marijuana.

Some authors have found that the prevalence of cigarette use in adolescents with ID is lower compared to general population \textsuperscript{29-30}. By contrast, the results of some studies have shown a higher prevalence of cigarette use in adolescent with ID \textsuperscript{31-32} or absence of significant differences when compared to general population \textsuperscript{33-34}. Empirical data on the proportion of adolescents with ID who have tried cigarettes are not consistent: 3.4\% \textsuperscript{35}; 16\% of boys and 17\% of girls \textsuperscript{31}; 30.1\% \textsuperscript{36}; 59.5\% \textsuperscript{29}. Assessments of the incidence of smoking also differ: 4.9–26.9\% are currently smoking \textsuperscript{30}, i.e. 30\% \textsuperscript{34}; 15\% have smoked more than once, and 14\% are currently smoking \textsuperscript{32}; 27\% of boys and 21\% of girls smoked during the previous year \textsuperscript{31}; 1.4\% smoke regularly \textsuperscript{29}.

Older studies reported that the prevalence of alcohol was lower in adolescents with ID than in general population \textsuperscript{30,37}. However, significant differences related to that have not been found in more recent studies \textsuperscript{29,33-34}. The literature provides the following data on the incidence of trying alcohol in adolescents with ID: 41\% \textsuperscript{32}; 48\% \textsuperscript{37}; 71.7\% \textsuperscript{29}. Authors who have dealt with these problems have different observations about the incidence of alcohol use: 22.7–54.5\% consumed alcohol in the previous year \textsuperscript{30}, i.e. 29.5\% \textsuperscript{36}; 8.8–35.5\% consumed alcohol in the previous month \textsuperscript{30}, i.e. 39\% \textsuperscript{37}; 0.6\% drink alcohol regularly \textsuperscript{35}.

It is generally believed that the use of illegal drugs is less prevalent in adolescents with ID than in general population \textsuperscript{29,33-34,37}. However, research results indicate that a significant number of adolescents with ID have tried marijuana: 10\% \textsuperscript{34}; 13\% \textsuperscript{33,37}, 34.3\% \textsuperscript{29}. Marijuana was used by 0.9–13.8\% \textsuperscript{30}, i.e. 10\% of adolescents \textsuperscript{37} over the previous month, and by 1.5–23.9\% during the previous year \textsuperscript{30}.

The aim of this study was to determine the existence and nature of the relations between three domains of resilience (sense of mastery, sense of relatedness, and emotional reactivity) and cigarette, alcohol, and marijuana use in adolescents with ID. With regard to previous studies, it was assumed that the SU negatively correlated with sense of mastery,
and positively with emotional reactivity. However, inconsistent findings on the role of sense of relatedness did not provide a basis for making initial assumptions about the relation between this domain of resilience and the SU.

**Method**

The research was conducted in four schools for students with disabilities in Belgrade. The sample included 100 adolescents with ID, 13-20 years of age (M = 15.59; SD = 1.736), of both genders (63% boys and 37% girls). There were no significant differences in the average age of male and female participants (t = 0.574; df = 98; p > 0.05). The participants’ intellectual functioning was at the level of mild ID (IQ = 50–69). The sample included only adolescents with adequate verbal abilities, who were assessed as able to give answers on a Likert-type scale. The sample did not include adolescents with dual diagnoses and multiple disabilities.

Data on participants’ age, gender, intellectual functioning, and health were taken from school records.

Peabody Picture Vocabulary Scale – PPVT-IV was used for the assessment of participants’ verbal abilities. Form A was applied in this research, with 114 items divided into 16 sets which test the knowledge of nouns, verbs, and adjectives from 20 different areas (e.g. plants, professions).

Youth Risk Behavior Survey – YRBS was used to collect data on the SU. Only the questions from the Scale on the SU related to the history of cigarette use (eight questions), alcohol use (six questions), and marijuana use (four questions) were used in this research. Due to considerable differences in responses to questions about the incidence of usage, data on whole-life prevalence of cigarette, alcohol, and marijuana use were used in the research, and the participants were grouped with regard to whether they had ever used the given psychoactive substances or not. Internal consistency of the scale applied in this research was good (α = 0.862).

Resiliency Scales for Children and Adolescents – RSCA were used to assess resilience. The instrument consisted of 64 questions distributed in the following three scales: Sense of Mastery Scale (MAS) consists of Optimism, Self-efficacy and Adaptability subscales; Sense of Relatedness Scale (REL) consists of Sense of Trust, Perceived Access to Support, Comfort with Others and Tolerance of Differences subscales; Emotional Reactivity Scale (REA) consists of Sensitivity, Recovery and Impairment subscales. Higher scores on MAS and REL scales, and lower scores on REA scale point to greater resilience.
Internal consistency of RSCA ($\alpha = 0.894$), as well as MAS ($\alpha = 0.820$), REL ($\alpha = 0.880$) and REA ($\alpha = 0.924$) was good in this research.

Informed consent was obtained from the school, parents, and participants for the purpose of this research. Class teachers selected students with adequate verbal abilities who were able to participate in the research. Also, before giving out the questionnaires, assessment of receptive speech was conducted by means of PPVT-IV. The participants achieved standard scores in the range 94–185 ($M = 135.61$; $SD = 22.861$). Research aims were explained and instructions on data collecting procedure were given to each participant. The participants were informed that participation in the research was voluntary and that their responses were confidential. The questionnaires were completed in a separate room in the school, without the presence of anybody else except the examiner and participants. The questions were read as they were given in questionnaires, with necessary additional explanations. The participants were required to choose one of the given answers. Cards with provided answers were made in order to make it easier for the participants to answer the questions.

Descriptive statistics, correlation method, and regression analysis (binary logistic analysis) were used in data analysis.

**Results**

Out of 100 participants, a total of 49% reported cigarette use, 63% reported alcohol use and 4% reported marijuana use at least once in their lifetime.

Table 1 includes data on the range, mean, and standard deviation of raw scores for MAS, REL, and REA scales and their subscales. Compared to normative population participants’ scores on MAS scale were in the below-average range, in the average range on REL scale, and in the above-average range on the REA scale.

The relation between main variables was tested by means of correlation method. Table 2 shows the values of Pearson correlation coefficient. Cigarette use had a statistically significant positive correlation with the scores on Adaptability subscale, REA scale and its subscales Sensitivity, Recovery, and Impairment. Alcohol use had a statistically significant positive correlation with the scores on REA scale and its subscales Sensitivity and Impairment, and a negative correlation with the scores on Optimism subscale. There were no significant correlations between marijuana use and the scores on Resiliency Scales for Children and Adolescents.
The relation between resilience and cigarette/alcohol use was assessed by a series of binary logistic analyses. Binary logistic analyses were not performed for marijuana use, since very few of the participants stated that they had tried marijuana (4 out of 100 participants) and there were no significant correlations.

The results of binary logistic analyses indicated that participants’ resilience was related to cigarette use (Chi-square = 13.384; df = 3; p = 0.004), with the achieved scores on REA scale being singled out as the only significant predictor (Table 3). By contrast, the assessed dimensions of resilience (MAS, REL, and REA) were not significant predictors of alcohol use (Chi-square = 6.789; df =3; p > 0.05).

The second series of binary logistic analyses assessed the predictive value of scores achieved on the subscales of MAS scale (Optimism, Self-efficacy, and Adaptability), the subscales of REL scale (Sense of Trust, Perceived Access to Support, Comfort with Others, and Tolerance of Differences), and the subscales of REA scale (Sensitivity, Recovery, and Impairment). The achieved scores on the mentioned subscales were not significant predictors of either cigarette use (Chi-square = 17.955; df = 10; p = 0.056) or alcohol use (Chi-square = 13.841; df = 10; p = 0.180).

**Discussion**

Although the prevalence of the SU in adolescents with ID is not the subject of this study, the obtained results deserve a brief comment. The incidence of cigarette and alcohol use was higher compared to the results of other studies conducted on samples of adolescents with ID in the USA, Great Britain, and Taiwan, and lower compared to empirical data from South Africa. However, the incidence of marijuana use was significantly lower compared to the results of studies conducted in other countries.

This research analyzed the relation between three domains of resilience and cigarette, alcohol, and marijuana use in adolescents with ID. The most important findings indicated that sense of mastery and sense of relatedness were not significantly related to the SU, while emotional reactivity was.

Contrary to our expectations, a negative correlation between sense of mastery and the SU was not confirmed. A very low positive correlation was determined between adaptability and cigarette use. This finding may be compared to observations of other
authors who found that, in the population of people with ID, smoking had a higher incidence in those with developed adaptive skills\textsuperscript{40-42}, and that cigarette use was a symbol of maturity and competence\textsuperscript{43} or a means to blend in\textsuperscript{44} for people with ID. Also, a very low negative correlation was determined between optimism and alcohol use, which is in accordance with the results of studies mentioned in the Introduction indicating that adolescents who had more positive expectations of the future used alcohol less frequently\textsuperscript{14-16}. When interpreting the results on the relation between sense of mastery and the SU, we should bear in mind that the participants generally had below-average scores on MAS scale. Thus, it is possible that the applied instrument was not sensitive enough to detect subtle individual differences in adolescents with ID.

The absence of significant correlations between sense of relatedness and the SU was somewhat expected. As already mentioned in the Introduction, the results of previous studies suggested that the nature of this relation varied depending on whether the relationship was with parents or with peers. The questions referring to relationships with parents and peers were not separated in REL scale, which could have influenced the obtained results.

The results of this research indicated that emotional reactivity was a significant predictor of cigarette use in adolescents with ID. In generally sparse literature on the SU in adolescents with ID, studies on the relation between the SU and emotional difficulties are quite rare. However, although scarce, the existing studies on risk factors of the SU in adolescents with ID suggest that mental health problems have a particularly important role\textsuperscript{36, 45-47}.

The obtained results are in accordance with the results of numerous studies which point to a significant relation between the SU and emotional difficulties in general population of adolescents. Authors who researched the relation between negative emotions and the SU consistently found that adolescents with higher negative affectivity used substances more frequently to overcome or alleviate unpleasant emotions\textsuperscript{28, 48-49}. Conclusions of the study which summarized the results of relevant research in this field emphasized that apart from negative affectivity, higher positive affectivity and poor regulation of emotions also had a significant role in initiation of SU\textsuperscript{50}. In other words, intensive emotional states, oversensitivity to emotional stimuli, and inability to control emotions increased the risk of SU in adolescence. Empirical data on frequent co-morbidity of SU and depression and anxiety disorders in adolescence\textsuperscript{26, 51-52} should also be
mentioned. The literature related to this subject shows that the prevalence of co-morbidity of SU and depression ranges from 11.1% to 32%, and of SU and anxiety disorders from 7% to 40.4% in adolescents.

According to the results of this research, emotional reactivity was significantly related to cigarette use, but not to alcohol use. A stronger connection of emotional difficulties with cigarette use than with alcohol use was also confirmed in studies conducted on samples of typically developing adolescents and adolescents with ID.

The relation between cigarette use and emotional difficulties in general population of adolescents has a good empirical basis, and research results on this subject have been summed up in several reviews of literature. A common conclusion of these studies is that emotional difficulties increase the risk of cigarette use in adolescence. The results of this research are supported by empirical data on higher incidence of cigarette use in adolescents with ID and mental health problems.

The relation between emotional difficulties and SU can be explained by self-medication hypothesis which implies that the SU functions as a compensatory means for modulating negative emotions and alleviating unpleasant psychological states. According to this hypothesis, the choice of psychoactive substances depends on the type of internal difficulties a person feels and physiological and psychological effects of the given substances. With regard to cigarette use, adolescents usually justify smoking by sedative and anxiolytic effects of nicotine, and suggest that the need for relaxation and stress reduction are their motives for cigarette use. Particularly interesting is an observation of some authors that the effects which adolescents experience when first consuming cigarettes influence their smoking later in a way that regular smoking is more frequent in those who experience more positive and fewer negative effects.

Explanation for the obtained results may also be sought in the motivational model of alcohol use in adolescence, according to which one of the motives is a desire or a need to avoid or alleviate unpleasant emotional experiences. This motive is considered to be an intermediary in the relation between negative emotions and SU. In this case, the SU represents a reactive process preceded by experiencing negative emotions and may be related to the symptoms of anxiety and depression. A similar pattern was determined in one of the few studies on how to cope with stress strategies in persons with ID who used substances. The authors of this research reported that persons with ID who used substances were prone to a “palliative” pattern of reacting to stress, i.e. that they had poorer
skills of relaxing and engaging in other activities when they were in stressful situations. The research in which the mentioned motivational model was applied to cigarette use showed that adolescents with increased anxiety were particularly prone to cigarette use motivated by avoiding unpleasant emotions because of anxiolytic effects of nicotine 60.

The influence of emotional difficulties on the SU varies depending on the presence of other risk factors. With regard to that, special attention was given to the influence of peer groups, and empirical findings confirmed that the relation between negative emotions and the SU increased by socializing with peers who used psychoactive substances 27. SU is more available in such an environment, while alternative activities and interactions which may help overcome negative emotions are highly limited 48. Although this research did not include the characteristics of friendly relationships, it is reasonable to assume that education in a restrictive environment consisting exclusively of peers with ID does not provide enough possibilities to learn effective emotion regulating strategies.

The literature discusses the possibility that emotional difficulties and the SU have a common etiology in genetic influences and environmental factors 62. This viewpoint is supported by empirical data on higher incidence of SU in adolescents with a family history of substance abuse 50.

Finally, many authors believe that the relation between the SU and emotional difficulties is two-way, i.e. that emotional difficulties may have a role of a risk factor or a consequence, depending on the phase of using psychoactive substances. The increased level of emotional difficulties increases the risk of initiation and experimental use of psychoactive substances, but regular SU contributes to emotional difficulties 50. Cigarette use may contribute to an increased level of stress and negative affectivity 54-56 and has proved to be a more significant predictor of severe symptoms of depression in adolescents than alcohol use 62-63.

This study has certain limitation that need to be mentioned. First of all, attention was directed at individual qualities which represent only one aspect of a complex resilience construct. Future research should be aimed at environmental influences and the interaction of individual and environmental factors. Second, only data obtained from adolescents with ID were used. Thus, different sources of information, methods and instruments should be used for assessing resilience and the SU in the future. Third, the research does offer a possibility to draw conclusions on causal relations between the assessed variables, which points to the need for longitudinal research of this subject.
Despite the mentioned limitations, the findings of this study provide a significant insight into insufficiently researched relation between the SU and sense of mastery, sense of relatedness, and emotional reactivity in adolescents with ID.

Identification of factors which contribute to the SU in adolescence has important implications for prevention. The results of this research suggest that attention should be directed at emotional difficulties which increase the risk of SU in adolescents with ID. Alleviating emotional difficulties may be a strong motivating factor for the SU and may increase adolescents’ susceptibility to negative influences of peers and the media. Therefore, in preventing the SU in adolescents with ID, priority should be given to interventions aimed at improving self-control and emotion regulation, as well as learning effective strategies to overcome negative emotions and stress. Bearing in mind the data on the incidence of cigarette and alcohol use in adolescents with ID, these interventions should be applied at a universal level, through organized curricular and extracurricular activities for all students.

**Conclusion**

The results of this research may contribute to understanding the relation between individual qualities of resilience and the SU in adolescents with ID. The obtained findings on a significant predictive value of emotional reactivity complement the extensive literature on the relation between emotional difficulties and the SU in adolescence. Future research should be aimed at studying mechanisms underlying this relation.

**Acknowledgements**

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REFERENCES:


### Table 1

<table>
<thead>
<tr>
<th>RSCA scales and subscales</th>
<th>Range</th>
<th>M</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>MAS</td>
<td>31–73</td>
<td>50.83</td>
<td>8.016</td>
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<tr>
<td>Optimism</td>
<td>10–25</td>
<td>17.37</td>
<td>3.569</td>
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<td>Self-efficacy</td>
<td>9–36</td>
<td>23.98</td>
<td>5.077</td>
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<tr>
<td>Adaptability</td>
<td>1–12</td>
<td>9.48</td>
<td>1.801</td>
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<tr>
<td>REL</td>
<td>40–96</td>
<td>71.34</td>
<td>10.050</td>
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<tr>
<td>Sense of trust</td>
<td>10–28</td>
<td>20.65</td>
<td>3.273</td>
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<tr>
<td>Perceived access to support</td>
<td>10–24</td>
<td>19.64</td>
<td>2.830</td>
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<tr>
<td>Comfort with others</td>
<td>6–16</td>
<td>11.46</td>
<td>2.298</td>
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<tr>
<td>Tolerance of differences</td>
<td>10–28</td>
<td>19.59</td>
<td>3.822</td>
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<tr>
<td>REA</td>
<td>0–66</td>
<td>33.17</td>
<td>13.761</td>
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<tr>
<td>Sensitivity</td>
<td>0–22</td>
<td>11.94</td>
<td>4.397</td>
</tr>
<tr>
<td>Recovery</td>
<td>0–16</td>
<td>5.41</td>
<td>3.015</td>
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<tr>
<td>Impairment</td>
<td>0–38</td>
<td>15.82</td>
<td>8.402</td>
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Table 2
Correlations between scores on RSCA and cigarette, alcohol and marijuana use

<table>
<thead>
<tr>
<th>RSCA scales and subscales</th>
<th>Cigarettes</th>
<th>Alcohol</th>
<th>Marijuana</th>
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</thead>
<tbody>
<tr>
<td>MAS</td>
<td>0.028</td>
<td>-0.105</td>
<td>0.171</td>
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<tr>
<td>Optimism</td>
<td>-0.085</td>
<td>-0.200*</td>
<td>0.180</td>
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<tr>
<td>Self-efficacy</td>
<td>0.032</td>
<td>-0.007</td>
<td>0.102</td>
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<tr>
<td>Adaptability</td>
<td>0.206*</td>
<td>-0.049</td>
<td>0.116</td>
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<tr>
<td>REL</td>
<td>-0.043</td>
<td>-0.024</td>
<td>0.044</td>
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<tr>
<td>Sense of trust</td>
<td>0.030</td>
<td>0.000</td>
<td>0.053</td>
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<td>Perceived access to support</td>
<td>0.019</td>
<td>-0.120</td>
<td>0.026</td>
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<td>Comfort with others</td>
<td>0.074</td>
<td>0.136</td>
<td>0.071</td>
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<td>Tolerance of differences</td>
<td>-0.147</td>
<td>-0.055</td>
<td>0.009</td>
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<tr>
<td>REA</td>
<td>0.352†</td>
<td>0.218*</td>
<td>0.027</td>
</tr>
<tr>
<td>Sensitivity</td>
<td>0.292†</td>
<td>0.198*</td>
<td>0.003</td>
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<tr>
<td>Recovery</td>
<td>0.233*</td>
<td>0.132</td>
<td>0.040</td>
</tr>
<tr>
<td>Impairment</td>
<td>0.339†</td>
<td>0.206*</td>
<td>0.029</td>
</tr>
</tbody>
</table>

* p < 0.05; † p < 0.01

Table 3
Characteristics of resilience dimensions as predictors in regression model

<table>
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<tr>
<th>RSCA scales</th>
<th>B</th>
<th>S.E.</th>
<th>Wald</th>
<th>df</th>
<th>p</th>
<th>Exp(B)</th>
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<td>MAS</td>
<td>0.002</td>
<td>0.030</td>
<td>0.007</td>
<td>1</td>
<td>0.936</td>
<td>1.002</td>
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<tr>
<td>REL</td>
<td>-0.010</td>
<td>0.024</td>
<td>0.177</td>
<td>1</td>
<td>0.674</td>
<td>0.990</td>
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<tr>
<td>REA</td>
<td>0.059</td>
<td>0.018</td>
<td>10.741</td>
<td>1</td>
<td>0.001</td>
<td>1.060</td>
</tr>
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