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Socialization in adults with intellectual disability: The effects of gender, mental illness, setting type, and level of intellectual disability

ABSTRACT

Introduction: The goal of this study was to examine the effects of gender, level of intellectual disability, mental illness, and setting type on socialization in adults with intellectual disability *Methods:* The sample consisted of 120 participants (60 males and 60 females), aged between 20 and 56 years, divided into two groups: 1. participants with intellectual disability without the diagnosis of mental illness (ID only) and 2. participants with dual diagnosis (intellectual disability and mental illness). Socialization subscale from the Vineland Adaptive Behavior Scale was used for the assessment of socialization. *Results:* Level of intellectual disability and mental illness had significant effects on socialization scores. In addition to this, interaction effect of gender and level of intellectual disability had a significant effect on socialization. Setting type did not have a significant effect on socialization. *Conclusion:* These results can be very useful in identifying participants with intellectual disability who might need additional individualized support programs in the area of socialization.

KEYWORDS: intellectual disability, dual diagnosis; gender; socialization

Introduction

According to the fifth Edition of the Diagnostic and Statistical Manual (DSM-5; APA, 2013), intellectual disability (ID) is a neurodevelopmental disorder characterized by deficits in intellectual and adaptive functioning. It is manifested in developmental period. Intellectual functions refer to reasoning abilities, problem-solving skills, planning, practical understanding, judgment, and learning. Deficit in adaptive functioning refers to deficits in conceptual, social, and practical areas that manifest itself across multiple contexts such as home, school, and community settings. The prevalence of ID is around 1% (McKenzie, Milton, Smith, & Ouellette Kuntz, 2016), but it can be up to 3% of the general population (Heikura et al., 2003). The level of ID has traditionally been determined by IQ level and ID was classified into four categories: mild (IQ = 50–75), moderate ID (IQ = 35–49), severe ID (IQ = 20–34) and profound ID (IQ < 20) (McCreary & Jones, 2013). Current conceptualizations of ID classification take other factors into account such as adaptive skills, social participation, health, and context (Schalock & Luckasson, 2015). In line with these new conceptualizations, DSM-5, replaced the use of IQ scores in determining ID severity, and proposed instead the use of adaptive behavior domains in determining support needs and ID severity. This change is best illustrated with the current American Association on Intellectual and Developmental Disability (AAIDD) conceptualizations and definitions of ID. According to the AAIDD, construct of ID emphasizes an ecological perspective that focuses on the interaction of the person and his/her environment and the notion that individualized supports can greatly enhance human functioning. ID is a disability characterized by significant limitations in both intellectual functioning and

adaptive behavior, which covers many everyday social and practical skills. ID originates before the age of 18 (Schalock et al., 2010).

Socialization is the process of acquiring and mastering social skills and is one of the key aspects of adaptive behavior (Barati, Tajrishi, & Sajedi, 2012). Social skills comprises a number of abilities including interpersonal skills, social responsibility, self-respect, rule-following, gullibility, and social problems resolving skills (Luckasson et al., 2002). Socialization has been widely studied in relation to the construct of social intelligence, a construct widely studied especially in people with intellectual disability (Kihlstorm & Cantor, 2000). Although, the concept of social intelligence has not gained universal acceptance as such, current evidence from the field of neuroscience provide scientific support for its existence (Baron-Cohen et al., 1999). Social intelligence can be defined in many ways. In its broadest sense social intelligence can be defined as a multifaceted ability manifested as a social competence in interpersonal relationships, social awareness, and empathy (Ford & Tisak, 1983). Another definition of social intelligence views it as the ability to interpret other's behavior, to interact in social groups and in close relationships and to predict how others will, think, and behave (Baron-Cohen et al., 1999).

By definition, persons with ID also have some deficits in the domain of socialization (Hattier, Matson, Tureck, & Horovitz, 2011; Smith & Matson, 2010). However, these deficits are not uniform, but have a wide range of expressions, from absence of certain behaviors to its overexpression (Bielecki & Swender, 2004). **DELETED** One way to conceptualize socialization is to view it as a set of activities that enable successful engagement in a social task (Lund & Merrell, 2001). Another way is to regard socialization as skills that allow individuals to start and maintain social interactions with other people and to maintain friendships (Hargie, Saunders, & Dickson, 1994; Lamont &

Van Horn, 2013). Socialization can also be viewed as a life-long process of social development and learning that occurs as individuals interact with one another and learn about proper behaviors within their societies (Delaney & Madigan, 2015). In this paper, we conceptualized socialization as part of adaptive behavior consisting of three domains: Interpersonal relations (How the individual interacts with others), Play and leisure time (How the individual plays and uses leisure time), and Coping skills (How the individual demonstrates responsibility and sensitivity to others) (Sparrow, Cicchetti, & Balla, 2006).

There are several potential explanations as to why persons with ID also have deficits in socialization domain. These explanations emphasize either biological or social factors. The first line of explanations stresses biological factors and views deficits in socialization as a consequence of primary neurologic deficit (Gresham & Elliott, 1989). The other line of explanations regards socialization deficits as a consequence of social rejection by the environment and fewer opportunities for people with ID to learn adequate social skills and social responses (Kearney & Healy, 2011). Socialization affects all other areas of functioning and well developed social skills can serve as a protective factor for many challenging behaviors (Sandoval, Lemos, & Vallejo, 2006). Studies have shown that socialization plays an important role in empathy, emotion recognition abilities, and behavior in general (Guralnick, 1999; Guralnick, 2006; Zion & Jenvey, 2006). Research in socialization in relation to gender has produced ambiguous results. These mixed findings may be due to the differential gender roles in various societies (Ram, Strohschein, Gaur, 2014). Some authors have found no differences between males and females with ID in regards to socialization (Umadevi & Sukumaran, 2012; Umb-Carlsson & Sonnander, 2006), while others found better socialization in females in the area of self-determination (Nota, Ferrari, Soresi, & Wehmeyer, 2007), advanced social interactions (Kaljača, Cvijetić, & Dučić, 2014) and better behavior management strategies (Bakoč & Kaljača, 2019).

Another factor affecting socialization is the level of ID. Persons with mild ID have better social outcomes than those with more severe levels of ID (Kaljača et al., 2014). Greater deficit in socialization in persons with moderate ID is likely to be moderated by

social-communicative impairments, which, in turn, is related to intellectual functioning (Christ et al., 2017). Persons with more severe levels of ID have less participation in community activities and lower level of employment (Dusseljee, Rijken, Cardol, Curfs, & Groenewegen, 2011; Mank, Cioffi, & Yovanoff, 1998). They also spend fewer years in the educational system (Li-Tsang, Yeung, Chan, & Hui-Chan, 2005). It is evident that persons with moderate and severe ID have fewer opportunities to gain, practice and master social skills and thus have more severe socialization deficits. This explanation is in line with Gresham's theory, that social environment is not providing enough opportunities for participation and interactions (Gresham, 1988). Equally valid explanation might be that deficit in intellectual skills is actually causing deficits in socialization. Most likely explanation is that both factors are involved and contribute independently and in interaction to deficits in the domain of socialization. .

Socialization, as viewed through social interactions and friendships, is one of the most important predictors of mental health (Gumpel, 2007). Studies have consistently implicated a link between socialization and psychiatric comorbidity; the higher the social deficit, the higher the psychopathology (Matson, Smiroldo, & Bamburg, 1998). Improvements in the socialization of people with ID can help reduce the risk of mental disorders (Adeniyi & Omigbodun, 2016). These findings show a clear link between socialization and mental health. According to some authors, increased vulnerability for psychiatric disorders in persons with ID stems from delayed speech development and deficits in cognitive skills (Bojanin, Kolar, & Kolar, 2002). These two factors, speech development and cognitive skills, contribute to problems in social interactions and thus to an increased risk for developing psychopathology. Persons with ID presenting with psychiatric symptoms also have an increased risk for behavioral problems (Hemmings, Gravestock, Pickard, & Bouras, 2006; Kearney & Healy, 2011; Myrbakk & von Tetzchner,

2008). Many studies have shown that people with ID often have a comorbid psychiatric condition (Cooper, Smiley, Morrison, Williamson, & Allan, 2007; Dekker & Koot, 2003; Dykens, 2000; Emerson, 2003; Emerson & Hatton, 2007; Koskentausta, Iivanainen, & Almqvist, 2002; Martorell et al., 2009; Platt, Keyes, McLaughlin, & Kaufman, 2019; Smiley et al., 2007; Tonge & Einfeld., 2000; White, Chant, Edwards, Townsend, & Waghorn, 2005). Studies to date have shown that presence of psychiatric conditions has a negative effect on everyday functioning of people with ID (Bouras et al., 2004; Dekker & Koot, 2003) and on their social skills (Kearney & Healy, 2011). Barisnikov and Straccia (2019) indicate that the level of psychopathology serves as a mediator between ID etiology and general level of socialization. According to these authors, assessment of the socialization domain in people with ID should be accompanied by the assessment of psychopathology in order to better understand all dimensions of socialization deficits.

Research regarding the prevalence of psychopathology in persons with ID has revealed mixed results (Einfeld, Ellis, & Emerson, 2011). Some studies have shown that there are no differences in prevalence of psychiatric illness in people with ID in relation to their gender (Baczała, 2016; Matson, Dempsey, & LoVullo, 2009; Umadevi & Sukumaran, 2012). On the other hand, there are studies indicating greater prevalence of depression in women with ID (Heiman, 2001; Heiman & Margalit, 1998; Lunskey, 2003; Lunskey, Bradley, Gracey, Durbin, & Koegl, 2009; Murray & Lopez, 1996; Reynolds & Miller, 1985). Heiman and Margalit (1998) explained their findings with the fact that women are more vulnerable than men and have more difficulties in expressing their emotions. Thus, some authors have even proposed development of gender-specific psychiatric services for women with ID as they represent especially vulnerable category for development of psychopathology (Taggart, McMillan, & Lawson, 2008). The gender differences in the prevalence of psychopathology probably depend on the type of

psychopathology. For example, some authors have found that personality disorders are more common among men, while dementia and adjustment reaction were more prevalent in women (Tsakanikos, Bouras, Sturmey, & Holt, 2006). Similarly, in a large cohort of older people with ID, authors found that the most common diagnosis among women was affective disorders and among men it was psychotic disorders (Axmon, Sandberg, & Ahlstrom, 2017).

Some explanations regarding gender differences in the prevalence of psychopathology postulate that males who have psychiatric diagnosis are affected more in the area of social and cognitive functioning than females, thus having more severe symptoms (Scott & Collings, 2010). This is explained by the fact that women are more inclined to seek medical assistance and are more willing to talk about their problems than men. Socialization outcomes do not differ in certain psychiatric conditions (schizophrenia and bipolar disorder), but there are differences in relation to the gender of participants with males expressing higher levels of sociability and social presence than females (Donohue & Lieberman, 1993). It is evident that gender can play a significant part in the manifestation of psychopathology symptoms (Lunsky et al., 2009; Seedat et al., 2009), as well as in expressing socialization aspects (Donohue & Lieberman, 1993) but the exact nature of that relationship is still unclear.

This study

After finishing their formal education, people with ID in Serbia do not have many options for vocational training and employment. In fact, depending on the family situation, most of the adults with ID attend adult daycare centers or are placed in large state-run institutions for life-long care. According to the data from 2009, there were 49 adult

daycare centers in Serbia serving 1418 service users, out of who 67% are adults with ID, and 27% are persons with multiple disabilities (Matković, 2009). Adult daycare centers provide daily services lasting from 6h to 10h and they are part of social care service supporting people with ID who are living in local communities (Article 44, Law on social care in Serbia). Besides promoting social skills, communication and adaptive behavior, adult daycare centers in Serbia aim to increase social participation of people with ID through various sport activities, art exhibitions, theater plays, workshops, etc. [Republički zavod za socijalnu zaštitu, (Serbia institute for social care) 2013]. After the death of their parents/caretakers, the most common option for people with ID is the placement in the state-run institutions for life-long care. There are 18 such institutions in Serbia with an accommodation capacity of 4339 [Republički zavod za socijalnu zaštitu, (Serbia institute for social care) 2013]. However, according to the data for 2012, there were 8345 people living in these institutions, which significantly exceed its accommodation capacities and thus impacts the quality of life of their users. Out of those, 46.7% have a diagnosis of mental illness, 31.8% have ID, and 11.8% are with multiple disabilities [Zaštitnik prava građana (Citizens rights watch), 2014]. High numbers of people with disabilities in these institutions is best explained by the shortage of community-based services (Brkić, Jugović,& Glumbić, 2014; Stanković, 2016).

The deinstitutionalization movement has become a central focus of social care reform system and the numbers of people in institutions is slowly declining (Ispanovic-Radojkovic & Stancheva-Popkostadinova, 2011). Serbia has signed the UN Convention on the Rights of Persons with Disabilities and Article 19 of the Convention is dedicated to Independent Living in local communities. We thus expect that community-based support

services will continue to grow in Serbia and thus improve the quality of life of persons with ID.

Given the fact that persons with ID have a wide spectrum of socialization deficits, the main goal of this study is to examine in what way gender (male - female), level of ID (mild ID – moderate ID), setting type (living at home – living at an institution) and presence of mental illness (does have a mental illness diagnosis - does not have a mental illness diagnosis) affect socialization in adults with ID.

In this study, we set the following research question:

1. What is the effect of gender, level of ID, setting type, and presence of mental illness on socialization scores?

Method

Participants

This was a convenient sample consisting of 120 participants (60 males and 60 females), aged between 20 and 56 years ($M = 31.82$, $SD = 8.70$), attending institutions of social care in Serbia, adult daycare centers (61 participants) and residential institutions (59 participants). Participants who attended adult day-care centers lived in their local communities, most of them with parents, but some also lived independently.

In Table 1. we present demographic data of participants.

TABLE 1 (Around here)

The participants with ID only had low intellectual and adaptive functioning of unknown etiology. According to the medical records, these participants had no psychiatric diagnosis and they did not use any psychotropic medications.

In the group of participants with DD, comorbid psychiatric disorders were diagnosed along with low intellectual and adaptive functioning. Diagnosis of mental illnesses were made in different time periods, and some were even made 40 years ago, according to various diagnostic criteria from ICD-9 (WHO, 1978), ICD-10 (WHO, 1992), and DSM-5 (American Psychiatric Association, 2013). Thus, the data contained in participants' medical records were not uniform. Some records contained diagnosis and codes (such as schizophrenia and schizoaffective disorders), while the others only contained general diagnostic category (such as psychosis) and some only contained reported symptoms (such as hallucinations and paranoid delusions). Due to these diagnostic inconsistencies we treated this group as participants with mental illness. Because of the presence of mental illness, the participants with DD used medications (antipsychotics), and their medical charts included information on occasional hospitalization in psychiatric institutions, while their lower intellectual functioning had unknown etiology.

Both groups had 25 participants with mild ID and 35 participants with moderate ID. All of the participants were diagnosed in childhood, and repeated diagnosis and obligatory psychiatric assessments were conducted upon the participants' admission to a social care institution.

As we wanted to reduce the impact of confounding variables, the exclusion criteria for both groups were severe visual and hearing impairment, bilingualism, autism spectrum disorder and brain injury.

Procedure

Contact persons from two adult day-care centers and one residential facility were asked to make a list of potential participants based on a-priori set of criteria (age above 20 years, ID level – mild and moderate, mental illness status (presence or absence), gender). After the list was made, we asked for a written consent of participants and their parents/caretakers and only after we obtained the consents, we started the assessment on the convenient sample of participants. Data on the level of intellectual functioning and presence of mental illness diagnosis were taken from the participants' personal records. The participants were also given Raven's Progressive Matrices in their social care institutions. Testing was performed individually in a quiet room in their institutions. All participants understood the task and performed it in line with their abilities. If the participant did not finish the task within 30 minutes the testing was discontinued. The participants were informed about the nature and content of the applied instruments and about the possibility of withdrawing from the procedure at any time.

Data for the *Vineland adaptive behavior scales* (VABS; Sparrow, Cicchetti, & Balla, 2006) – Socialization subscale were collected from special educators and rehabilitators (formerly known as defectologists??), who had known the participants for at least six months and had a contact with participants on most days of the week days. It took approximately 30 minutes for the educators to complete the scales. We told the educators to select one of three options that best describe the participant. According to the VABS manual, behaviors that manifest often were marked with 2, behaviors that manifest occasionally were marked with 1 point and behaviors that never manifest were marked with 0 points. The participants and their legal guardians were aware that the obtained results would be used anonymously, solely for the scientific purposes and that the confidentiality of any information obtained would be respected.

Ethics

The research was approved by the Ethics Committee of the Faculty of Special Education and Rehabilitation, University of Belgrade.

Instruments

Raven's progressive matrices (RPM; Raven & Raven, 1998)

Given the fact that educational records of the participants contained information on the level of ID, but the exact IQ scores were used inconsistently, we used RPM to examine whether participants with ID did in fact had ID. RPM is a nonverbal test for measuring fluid intelligence and is purported to be a measure of pure "g" or general intelligence. The test consists of 60 items organized in five sets. Items within a set become increasingly difficult requiring greater cognitive skills in order to solve the problem. One of the advantages of this test is that it is not dependent on language abilities.

Vineland adaptive behavior scales (VABS, Sparrow, Cicchetti, & Balla, 2006)

To assess socialization skills, we used the Socialization subscale from VABS – teacher form (??), which consists of three subscales: Interpersonal relations, Play and leisure time, and Coping skills (Sparrow et al., 2006). Interpersonal relations subscale consists of 23 items describing different social behaviors. Play and Leisure time subscale has 18 items regarding free and cooperative activities and participation in these activities. Lastly, Coping skills subscale consists of 19 items describing self-control skills and adaptation to new situations. A total raw score for Socialization was calculated by adding up these three scores. Cronbach alpha reliability coefficient in the sample of 826 participants with ID for this scale was .97 (De Bildt, Kraijer, Sytema, & Minderaa, 2005).

In this study we adopted a Croatian version of VABS (Sladić-Kljaić, 2011) and used the raw scores as the instrument has not been standardized in Serbia. However, although the instrument has not been standardized, many studies conducted in Serbia show its very good psychometric properties and Cronbach's alpha value ranging from .83 to .93 (Cvijetić & Gagić, 2017; Đorđević, Glumbić, & Brojčin, 2016). In this study Cronbach alpha was .93, .92, and .89 for Interpersonal relations, Play and Leisure time, and Coping skills respectively.

Data analysis

Data are presented descriptively for all categories separately and they were also presented through cross-tables so the readers can gain better insight in the scores distribution. We then performed a multiple regression analysis predicting socialization scores from a set of independent variables: gender, presence of mental illness, level of ID, and setting type. A two factorial ANOVA was performed for illustrating interaction effects . An alpha level of .05 was set for all tests.

Results

The complete sample was divided into two groups: 1. participants with ID without the diagnosis of mental illness and 2. participants with dual diagnosis, ID + mental illness (DD). Each group consisted of 60 participants (30 males and 30 females). Mental illness was equally distributed across the gender (50% in males, 50% in females), ID level (50% in mild ID, 50% in moderate ID), and setting type (51.7% in home setting, 48.3% in institutional setting). In relation to Raven's progressive matrices, there were no statistically significant differences in relation to mental illness, $t(118) = 1.20$; $p = .232$, and setting type $t(118) = 0.33$; $p = .74$. However there were statistically significant differences in relation to level of ID, $t(118) = 3.2$; $p < .001$ and differences in relation to gender $t(118) = 3.4$; $p < .001$; participants with mild ID achieving higher scores than participants with moderate ID, and males achieving higher scores than females.

The age of participants was not significantly related with socialization scores ($r = .04$; $p = .64$). On the other hand, socialization scores and scores on Raven's Progressive Matrices were statistically significantly correlated and the degree of correlation was moderate ($r = .30$; $p < .01$).

Descriptive data for Socialization scores in relation to predictor variables are presented in Table 2.

Table 2. (about here)

We next performed a multiple regression analysis examining the main effects of gender (male-female), level of ID (mild-moderate), mental illness (yes-no), setting type (home-institution), and their two-way interactions as the independent (predictor) variables, and socialization scores as the dependent (outcome) variable. Four-way effect and three-ways effects were not statistically significant and were not included in the

model. As a measure of effect size we reported omega squared (ω^2) for significant effects, which is a less biased measure of an effect size that is used for comparison of effects within a single study (Lakens, 2013). Interpretations of these effect sizes are: .01- small effect, .06- medium effect and .14 large effect (Cohen, 2013). These results are shown in Table 3.

Table 3. (about here)

The model presented in Table 3. was statistically significant $F(10, 109) = 3.2; p = .001$. and explained about 15% of the variance in the socialization scores. Significant predictors were level of ID (effect size $\omega^2 = .09$, medium effect size) and mental illness (effect size $\omega^2 = .05$, small to medium effect size). Besides these two significant main effects, there was also a significant two-way interaction effect of gender and level of ID (effect size $\omega^2 = .03$, small to medium effect size) on socialization scores. This interaction effect is presented in Figure 1.

Figure 1. (about here)

As can be seen from Figure 1, females had greater variance in socialization scores than males. While females in the mild ID category achieved slightly better results than males in socialization, this is reverse for the moderate ID category, where males achieved much higher results in socialization than females.

Discussion

The goal of the present study was to examine the effects of gender, level of ID, presence of mental illness, and setting type on socialization in persons with ID. Gender of the participants did not have a significant effect on socialization, meaning that males and females did not differ on mean socialization scores. However, this finding should be interpreted cautiously as the level of ID affected this relationship. For the participants with mild ID, there seem to be no statistically significant differences in socialization. However, for the participants with moderate ID, male participants achieved significantly higher results than females. One potential explanation for this finding might be in the different development of socialization in relation to gender and the possibility that females may be better in masking social deficits (McVey et al., 2017). However, it might also be the case that, at a more severe level of ID, females are less efficient in employing this strategy, and thus the difference in socialization in the group with moderate ID. Another potential explanation of this finding is that socialization skills might actually improve with age in males with ID (De Ruiter, Dekker, Verhulst, & Koot, 2007). After finishing school, most males start to do some manual work and their working environment might have a positive effect on their social development. Thus, future studies should include the employment status as a potentially moderating variable of socialization.

In the light of these explanations, and the fact that female participants with moderate ID achieved lower scores in Socialization, we might look for potential reasons in the role of women in society. Very often, women with ID compare themselves with

women without ID in regard to the social roles they are expected to fulfill (role of mother, spouse, to have a partner etc.) and non-fulfillment of these roles has a negative effect on their self-esteem and their social activities (Taggart, McMillan, & Lawson, 2009).

Although, VABS has been standardized in various clinical populations and differences were found to be small in relation to gender, socio-economic status, ethnic and group membership (Community-University Partnership for the Study of Children, Youth, and Families, 2011), there are reports that some VABS items might require modifications especially relating to the gender roles (Manohari, Raman, & Ashok, 2013). It might be the case that some items were too male-centric in our study as well and thus the differences in the moderate ID category between males and females. Another potential explanation is related to the potential bias in the reports given by the staff, and this is related to the so called “double-discrimination” theory. According to this theory, the staff might have reported that females with more severe level of ID have less opportunities to fulfill societal norms (Coleman, Brunell, & Haugen, 2014).

We also found a strong effect of ID level on socialization in persons with ID. Participants with mild ID have achieved much better socialization scores than participants with moderate ID. This finding is consistent with other studies (Kaljača et al., 2014; Umadevi & Sukumaran, 2012). However, some studies show that at an earlier age, basic social skills do not play a significant role in differentiating between children with different levels of ID (de Bildt et al., 2005), which demonstrates that, with age, there is a stronger relationship between intellectual functioning and socialization.

This study has provided additional support for the claim that mental illness has a negative effect on socialization. Participants with DD achieved lower scores in socialization than participants with ID only. Similar results were obtained in other studies as well (Kearney & Healy, 2011; Matson et al., 1998; Matson et al., 2009). Matson et al.

(2009) have shown that persons with ID who have symptoms of impulsivity, mania, autism, anxiety, and stereotypic behavior also have more negative social behavior. However it is important to note that negative social behavior does not mean absence of socialization skills. Thus, some adaptive scales also include “negative behaviors” as a separate subscale in addition to the scales measuring socialization skills. Kearney and Healy (2011) explained how lower social skills in persons with DD further negatively affect their Quality of Life and their social participation. Also, Tomlinson & Hewitt (2017) found that people with mild ID and mental health issues report feelings of being rejected and isolated and have a negative view of self. Lastly we found no effect of setting type on the socialization scores. This finding is in contrast...???

Providing support to persons with both ID and mental illness is very challenging and many professionals are not adequately prepared for that role (Adhead, Colier, & Kennedy, 2015). Thus, professionals working with people with ID and mental illness need to have better training in the areas of both intellectual disability and mental health in order to respond adequately to their needs. One particular area that deserves the attention of the professionals is the area of socialization. Better social skills of people with ID and mental illness will lead to their better inclusion in the society, and should thus be the focus of psychosocial and educational intervention. The results of this study further emphasize the need for creating programs for promotion and enhancement of social competence in people with ID. This, in turn, will probably lead to their overall better mental health. This study has several important practical implications. We found additional evidence on the strong link between mental health and socialization. Although the design of this study did not allow us to establish a causal link of socialization deficits

and mental illness, we can be confident in the claim that training in socializations will lead to improved mental health. We also identified that females at more severe level of intellectual disability are additionally jeopardized. Thus, it is this particular group that will need special attention from support services in enhancing their socialization levels. Finally, this is the first study in Serbia regarding socialization in people with ID that took into account gender, level of ID, setting type and presence of mental illness and it is our hope that it will spark an additional interest in this topic and contribute to improving support services for the population of people with ID.

There are several limitations in this study that need to be noted. The sample for this study was convenient and thus the results might have limited generalizability. Second, we did not control for some important covariates, such as the type of psychiatric diagnosis and severity of psychiatric symptoms, as well as the employment status, family structure and unfavorable life experiences such as stigmatization and abuse. Another limitation is the lack of validation of psychiatric diagnosis. Given the fact that some participants got their diagnosis of mental illness several decades ago, we should leave open the possibility that some of these diagnosis were not accurate and that some of the participants might have had the autism spectrum disorder. Another limitation is that the ratings were completed only by teachers and it would be beneficial to have ratings from persons who see them in settings outside of the “day-time” program. Finally, we only used Socialization subscale of VABS, and did not assess the impact of gender, level of ID, setting type, and presence of mental illness on other Adaptive behavior domains.

Future research needs to take these factors into account and apart from using different sample to validate this study, it would also be very beneficial to use more instruments to measure the construct of socialization.

Conclusion

This study has shown that level of intellectual disability and mental illness have an effect on socialization scores. In addition to this, an interaction effect of gender and level of intellectual disability had a significant effect on socialization. Females in the moderate intellectual disability category had much lower socialization scores than males with moderate intellectual disability. Participants with dual diagnosis had lower socialization scores than participants with ID only. Also, participants with moderate ID had lower mean socialization scores than participants with mild ID. Setting type did not have an effect on socialization, meaning that participants living in the community and those living in an institution had similar socialization scores.

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