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INDIVIDUAL AND CONTEXTUAL FACTORS OF WEAPON CARRYING AND ASSAULTING WITH WEAPONS IN SCHOOL AMONG HIGH SCHOOL PUPILS IN SERBIA

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A B S T R A C T

Carrying weapons to school poses a significant security risk for all individuals involved. The aim of this research was to examine the individual and contextual factors (family- and school-related) of weapons carrying and assaulting with weapon in schools. The research was conducted in 2014 on a sample of 649 high school pupils from Serbia. The results reveal that the common factors of carrying and using weapon are the perpetrators being male and their being victims of peer violence, vengefulness, dominance, anger, lack of empathy, seeking revenge, and limited use of active problem-solving, as well as their fathers tending to have a lower level of education, lower grades, attending vocational schools, and poor academic performance. In addition, victims of bullying in cases of peer violence tend to carry weapon more frequently, and they assault with a weapon just as frequently as bullies do. Pupils who have assaulted someone with a weapon show a tendency towards peer violence and dominance, and have lower cognitive empathy and hostility, compared to pupils who carry a weapon, but have not yet attacked anyone. The results support the vulnerability hypothesis regarding weapon carrying, and the antisocial profile hypothesis regarding assaulting with a weapon. The practical implications of the results refer to the importance of planned, targeted prevention programs in the school context.

Key words:

weapon carrying, assaulting with weapon, peer violence, family, school

■ INTRODUCTION

Carrying weapons to school is a form of extreme physical violence and a serious security risk for everyone involved in the school environment, including both pupils and employees. Although carrying weapons to school is less prevalent in European countries compared to American countries, it is not negligible, ranging from 1.0% to 18.6%, depending on gender (see Pickett et al., 2005). In the Balkan region it was found that, for example, 15.5% of boys and 2.6% of girls in Macedonia (Pickett et al., 2005) and 10.5% of boys and 1% of girls in the Republic of Srpska (Bojanić et al., 2006) carried weapons to schools. According to the studies conducted in the Republic of Serbia in 2013-2014, 18.5% of boys and 3.6 % of girls stated that, by the time of participating in the survey, they had carried a weapon or a tool with which they could hurt others (Ćopić, 2016), and that for 40.8% of them the last time they carried a weapon was at school (Kovačević, 2016).

Most researchers agree that peer violence, like any other type of violence, involves a complex relationship of risk and protective factors (e.g., Richman & Fraser, 2001) from the domain of individual and contextual factors (e.g., family, peers, school). Previous studies were consistent in reporting that the risk factors of carrying weapons to school are the perpetrators being male, having more conflicts and supportive attitudes towards physical aggression in the family, and school absenteeism, while protective factors include pupils living with both parents, a higher level of parental supervision, positive attitudes towards school, greater involvement in school activities and teacher support (Finnigan-Carr et al., 2015; Kulig et al., 1998; Marsh & William, 2007; McGee et al., 2005; Pengpid & Peltzer, 2020). The role of parents' financial status and education is not consistent (e.g., in the research by Kulig et al., 1998; Marsh & William, 2007 it is not significant, while in Khoury-Kassabri et al., 2007 it has a negative effect). Likewise, the findings related to the effects of pupils' age are not consistent (in Marsh & William, 2007, pupils less likely to carry weapon are older female pupils, while in Kulig et al., 1998, it is younger male pupils).

Apart from socio-demographic characteristics, further examination of individual factors in cross-national studies consistently indicate that carrying weapons to school is associated with peer violence perpetration and victimization (Stickley et al., 2015), including cyberbullying victimization (Brady et al., 2020) and having witnessed a crime (Kulig et al., 1998). However, there are inconsistencies in findings indicating association between weapon carrying to school and violence perpetration and victimization: in some studies, carrying weapons to school is associated only with aggression perpetration, but not with being a victim of peer aggression (Dijkstra et al., 2010), while in some studies, the association is indicated only with being a victim of physical attacks (Pengpid & Peltzer, 2020), or with the role of bully-victim in peer violence, but not with the role of a "pure" victim or bully (Lu et al., 2018). A meta-analysis (van Geel et al., 2014) indicated the strongest

association between carrying weapons and the role of bully-victim, while another study (Valdebenito et al., 2017) showed that both the roles of victim and bully-victim are more indicative of weapon carrying to school, while the role of bully is equally indicative of weapon carrying both in school and out of school. Overall, the findings support two approaches to explaining the association between weapon carrying to school and peer violence: 1) the vulnerability/self-protection hypothesis, according to which pupils carry weapons to protect themselves in case they are attacked; and 2) the antisocial personality profile hypothesis, according to which pupils carry weapons to harm other persons or achieve certain status in the group (e.g., Valdebenito et al., 2017).

Other risk factors associated with weapon carrying are substance use (Kulig et al., 1998; Stickley et al., 2015; Pengpid & Peltzer, 2020) and associating with delinquent peers (Stickley et al., 2015; Pengpid & Peltzer, 2020). Previous studies indicate that weapon carrying is associated with peer influence and gaining status in peer groups (Dijkstra et al., 2010) and greater acceptance of deviant behavior among peers (Finnigan-Carr et al., 2015). Considering the protective factors, self-control proved to be one of the most significant protective factors (Finnigan-Carr et al., 2015). Some researchers point out that the profile of adolescent weapon carrying to school is similar to the profile of delinquents, including substance use, problems at school, lower cognitive capacity levels, exposure to injuries resulting in loss of consciousness (Finkenbine & Dwyer, 2006), and psychopathy (Saukkonen et al., 2016), which provides support for the antisocial profile hypothesis. On the other hand, mental problems, such as suicidal ideation (Kulig et al., 1998) and exposure to multiple psychological stressors (Pengpid & Peltzer, 2020), are also identified as correlates of weapon carrying to school, which supports the vulnerability hypothesis.

Apart from the dilemma concerning the approach which better explains weapon carrying to school, there is also the issue of drawing distinction between adolescents who carry weapon and those who have used weapon. One of the rare studies examining this issue shows that weapon carrying is associated with delinquent behavior and being a victim of physical violence, while in adolescent males it is additionally linked to quarrelling while intoxicated, sensation seeking, and poor relationship with parents (Thurnherr et al., 2009). On the other hand, using weapon is associated with smoking in adolescent females, while in males it is being of foreign origin, quarrelling while intoxicated, and having a low sense of being connected with school (Thurnherr et al., 2009).

The Current Study

Although previous studies point to certain protective and risk factors of weapon carrying to school, researchers agree that future studies should provide better insights into a wider range of factors, especially protective factors (Aspy et al., 2004). The aim of this research is to examine a wider set of correlates of weapon carrying and using a weapon in school from the domain of individual and contextual factors of adolescents in Serbia. Studies on weapon carrying to school by young people in Serbia are scarce. For example, in the period from 2000 to 2017, there were no research articles in KoBSON database for the keywords disarmament, weapon+children, weapon+youth, weapon+adolescents, weapon+teenagers, while there were two theoretical articles found in COBIS.SR database (Weizner, 2017). The results of additional search for the period before the May 15th 2024 were the same for these databases. As the level of risk and vulnerability of adolescent population is very high, Weisner (2017, p. 31) warns that this issue needs to be studied “with the greatest seriousness, responsibility and expertise”. Therefore, this is the first empirical study in Serbia to examine the factors of carrying and using weapon in school.

The investigated individual factors include gender, peer violence perpetration and victimization, attitudes towards school violence, personality characteristics linked to peer violence (aggression and empathy, see Dinić et al., 2014; Dinić et al., 2016) and coping strategies. As findings in previous studies are not consistent about the role of violence perpetration and victimization, and are focused on physical violence (e.g. Pengpid & Peltzer, 2020), we closely examine the relationship between weapon carrying and assaulting with weapon in school and peer violence, including also other types of violence (verbal and relational). A better insight into these relationships will be provided by including also associations with the aggressiveness dimensions. Namely, meta-analyses (Valdebentino et al., 2017; van Geel et al., 2014) revealed that bully-victims are a critical group for weapon carrying to school, and this group is characterized by a specific aggressive profile that includes higher levels of anger and hostility (e.g., Walters & Espelage, 2018). Furthermore, in order to more closely examine the protective factors, we included factors related to empathy and coping strategies, as potentially significant resources for prevention. Previous studies point out that lack of self-control (Finnigan-Carr et al., 2015) and different mental health problems (Finkenbine & Dwyer, 2006) are associated with weapon carrying to school, so this research included coping strategies narrowly focused on coping with peer victimization. Overall, we hypothesized that, among individual factors, being male, having more supportive attitudes towards school violence, higher aggressiveness, and lower empathy will be significant correlates of weapon carrying to school. However, there is inconsistency regarding which approach can be used to explain carrying and using weapons – the vulnerability hypothesis or the antisocial profile hypothesis. Therefore, we included individual factors related

to peer violence perpetration and victimization and coping strategies, as well as aggressiveness dimensions, which could contribute to a better understanding of weapon carrying. If we find that factors related to weapon carrying are victimization, non-adaptive coping (such as low seeking support and passive coping), hostility, and anger as aggressiveness dimensions, then the vulnerability hypothesis will be confirmed. On the other hand, if we find that factors related to weapon carrying are violence perpetration and dominance as an aggressiveness dimension, then the antisocial profile hypothesis will be confirmed. Moreover, the distinction between weapon carrying and assaulting with the weapon would provide better insights into the confirmation of these two hypotheses. We assume that weapon carriers would manifest a profile typical of the vulnerability approach, while weapon attackers would manifest a profile typical of the antisocial approach.

The contextual factors include common family-related factors (family type – complete or not, number of children in the family, birth order, parental education level, financial status) and school-related factors (pupils' grade, academic performance, type of school). Findings in previous research were not consistent regarding certain investigated factors (e.g., financial status, Khoury-Kassabri et al., 2007; Marsh & William, 2007), while some factors have not been sufficiently investigated (e.g., number of children in the family). Accordingly, this research aims to include these factors as they can be more easily detected by teachers. Therefore, among family-related factors, we hypothesized that coming from an incomplete family would be a significant correlate of weapon carrying. Among school-related factors, lower academic performance and attending a vocational school should be significant correlates of weapon carrying. Considering the inconsistent previous results regarding the family-related factor of financial status, which is also related to parental educational level, as well as adolescents' age, which in our study is included as grade level, we do not have clear expectations regarding these factors.

■ METHOD

Sample

The sample comprised second (215), third (203) and fourth grade pupils (231) attending high schools on the territory of the city of Novi Sad in Serbia ($N=649$, 61.8% male), aged between 16-18. First grade pupils were not included as the research was conducted at the beginning of the school year. The schools which the pupils attended included 3 grammar schools (161) and 5 vocational schools (488). The majority of pupils live with both parents (79.8%), while 18.0% of them live with one parent, relatives/friends or something else. The most frequent level of parental education

is completed high school for both father (52.1%) and mother (48.8%), followed by bachelor, master's or doctorate degree (27.7% for father and 29.9% for mother). The majority of pupils (75.0%) estimate their financial situation as being the same as in their peers' families, 11.4% of respondents believe that it is better compared to other pupils' families, while 8.5% state that their financial situation is worse than in their peers' families.

The sample was collected as part of "Peer Violence among High School Youth" project supported by Novi Sad City Administration for Sports and Youth – Youth Office in 2014. Testing was conducted in schools during classes by trained psychology students, with the approval of the principal, class teachers and school psychologists, and with prior parental consent. The questionnaires were anonymous, and were distributed in paper-and-pencil form with prior signed informed consent. After the pupils completed the questionnaires, the psychology students provided more detailed information about the research, explained the key concepts and left a contact for psychological support for the pupils.

Instruments

Questions about Weapon Carrying. The participants were asked three questions about the prevalence of: carrying a weapon, assaulting someone with a weapon and being a victim of weapon assault in school during the past school year. The questions were accompanied by five-point scale (from 0 – *never* to 4 – *several times a week*).

Peer Violence and Victimization Questionnaire PVVQ (Dinić et al., 2014). PVVQ consists of two dimensions – perpetration of peer violence and being a victim of peer violence in the past school year, where each dimension contains 14 items describing perpetration or victimization of physical (7 items), verbal (3 items) and relational violence (4 items). The items were accompanied by five-point scales for assessing the prevalence of perpetrating violence or being a victim of violence (from 0 – *never* to 4 – *several times a week*). The α reliabilities ranged from .68 (perpetration of relational violence) to .87 (perpetration of physical violence).

Aggressiveness Questionnaire AVDH (Dinić et al., 2014). AVDH questionnaire contains 23 items measuring four facets of aggressiveness: anger (frequent experiencing and expressing of anger, $n=5$, $\alpha=.83$), vengefulness (planning and imagining hurting another person who has done something bad to us, $n=6$, $\alpha=.86$), dominance (quarrelling and intrusive behavior aimed at achieving social dominance, $n=7$, $\alpha=.84$) and hostility (belligerent attitude and intolerance towards others, $n=5$, $\alpha=.59$). The questionnaire was accompanied with a five-point scale (from 1 – *I strongly disagree* to 5 – *I strongly agree*).

Basic Empathy Scale BES (Jolliffe & Farrington, 2006, for Serbian adaptation see Dinić et al., 2016). This scale contains 20 items measuring affective empathy (sympathy with other people's emotions and emotional states, $n=11$, $\alpha=.78$) and

cognitive empathy (understanding other people's emotions, $n=9$, $\alpha=.80$). A five-point scale for answering was provided for the items (from 1 – *I strongly disagree* to 5 – *I strongly agree*).

Coping Strategies Scale – “What I would do?” WID (Kochenderfer-Ladd & Pelletier, 2008). This scale contains 24 items. The respondents need to rate on a three-point scale (*never/sometimes/often*) how often they would take certain actions in case of verbal or physical assault by another pupil. The scale was developed based on previous findings on dominant approach coping strategies (seeking help from others, focusing on problem-solving) or avoidance coping strategies (nonchalance, internalizing/externalizing problems). The scale is intended to assess five different mechanisms of coping with peer violence: adult support (“I tell my mother or father what happened”, $n=4$, $\alpha=.72$), problem-solving, including seeking support from friends (“I try to think of a way to solve it”, $n=5$, $\alpha=.67$), revenge seeking (“I do something mean to them back”, $n=5$, $\alpha=.79$), distancing (“I act like nothing happened”, $n=4$, $\alpha=.53$) and passive coping (“Become so upset you cannot talk to anyone”, “Feel like crying”, $n=6$, $\alpha=.64$). The scale was translated for the needs of the project and it was the first time it was used in Serbian.

Bullying Attitudinal Scale from the Bully Survey – Part D (Swearer & Carry, 2003, for adaptation in Serbian see Oljača et al., 2015). The scale contains 14 items accompanied with a five-point scale (from 1 – *I strongly disagree* to 5 – *I strongly agree*). A higher score on the scale indicates a supportive and positive attitude towards bullies and violence, i.e. bullies are seen as persons who are popular and desirable to be friends with, who have no intent to hurt anyone, while violence is not perceived as a problem for pupils, it is even justified and considered desirable for bullied pupils to “toughen up”. The reliability of the scale is $\alpha=.82$.

■ RESULTS

Prevalence of Weapon Carrying and Assaulting with a Weapon in School

The results reveal that 11.6% of pupils carried a weapon to school, 8.3% of pupils assaulted someone with a weapon, while 10.3% were assaulted with a weapon in the past school year (Table 1). Although the prevalence of such behavior is low, what causes concern is the fact that 1.4% of pupils assaulted someone with a weapon several times a week and that 1.5% of pupils were assaulted with a weapon several times a week. Given the distribution of responses, further analyses will employ nonparametric methods.

Table 1. Frequencies and percentages of responses to the questions about the prevalence of weapon carrying and assaulting with weapon in the past school year (N=649)

Responses	How often did you bring a weapon to school last year?	How often did you assault someone with a weapon last year?	How often did someone assault you with a weapon during the previous school year?
never	574 (88.4%)	595 (91.7%)	582 (89.7%)
several times a year	31 (4.8%)	20 (3.1%)	36 (5.5%)
several times a month	14 (2.2%)	16 (2.5%)	16 (2.5%)
once a week	13 (2.0%)	8 (1.2%)	5 (0.8%)
several times a week	14 (2.2%)	9 (1.4%)	10 (1.5%)
missing data	3 (0.5%)	1 (0.2%)	0

Individual Factors

There are significant gender differences in all three questions related to weapon carrying. As expected, male adolescents more frequently carried weapon ($U=42461.50, p<.001$), assaulted someone with weapon ($U=44375, p<.001$) and were a victim of assault with a weapon ($U=43182, p<.001$). Perpetrating and being a victim of all forms of peer violence and supportive attitudes towards violence are positively associated with the responses to all three questions, as well as all dimensions of aggressiveness, except for hostility, which is negatively related to assaulting with a weapon and has no significant correlations with the responses to the remaining two questions (Table 2). Cognitive empathy is negatively related to the responses to all three questions, while affective empathy is negatively related to weapon carrying and assaulting with a weapon, but there is no significant correlation with being a victim of assault. Coping strategies are generally weakly related to the responses to these three questions. However, it can be observed that revenge seeking has a positive correlation, while problem solving has a negative correlation with the responses to all three questions, and passive coping has a low positive correlation with being a victim of an assault with a weapon.

Based on the significance of the correlations difference (Steiger’s Z test, calculated via https://www.psychmike.com/dependent_correlations.php), it can be observed that the correlation patterns are similar for question about carrying a weapon and about assaulting someone with a weapon (Table 2). On the other hand, the differences between correlations between these two questions are that assaulting

with weapon has a significantly higher correlation with perpetrating relational violence (positive), hostility and cognitive empathy (both negative), whereas weapon carrying has a significantly higher correlation with being a victim of physical violence. There are also significant differences in adult support, but since these correlations are not significant, they will not be further discussed. The differences in the correlations between the responses to the question about being assaulted with a weapon and the responses to the other two questions (questions about weapon carrying and assaulting with weapon) are significant in relation to perpetration of all three forms of peer violence, anger and attitudes towards violence, as the correlations with these factors are lower for question about being assaulted with a weapon. In addition, there are also differences in the correlations with victimization of relational violence, as this correlation is higher for question about being assaulted with a weapon.

Roles in Peer Violence. Pupils were divided into 4 roles for each type of violence based on the scores for PVVQ dimensions: 1) not involved in violence (pupils with a score of 0 on the dimensions of perpetration and victimization); 2) bullies (pupils with a score of 0 on the dimensions of victimization and a score > 0 on the dimensions of perpetration); 3) victims (pupils with a score of 0 on the dimensions of perpetration and a score > 0 on the dimensions of victimization); 4) bully-victims (pupils with scores > 0 on the dimensions of perpetration and victimization). As the focus is on differences between active roles in violence (i.e., without pupils not involved in violence), significant differences were determined between roles in physical violence in the responses to the question about weapon carrying ($K-W_{(2)}=10.08$, $p=.006$), whereas bully-victims carry weapon more often than bullies ($p=.018$) and victims ($p=.013$). There were no differences between active roles in verbal ($K-W_{(2)}=0.32$, $p>.05$) and relational violence ($K-W_{(2)}=2.14$, $p>.05$).

Concerning responses to the question about assaulting with a weapon, differences between roles in physical violence were only marginally significant ($K-W_{(2)}=5.46$, $p=.065$), with bully-victims having higher scores than victims ($p=.038$), while other differences were not significant ($p>.05$). Accordingly, bully-victims in physical violence carry weapon more often and assault with weapons more often than victims, while they carry weapon more often than bullies, but they assault with weapons just as much as bullies. Perpetrators and victims of physical violence do not differ significantly in weapon carrying and assaulting with a weapon, but they differ, as expected, only in victimization in the case of assaulting with a weapon ($p=.001$).

Table 2. Spearman's rank correlation coefficients (ρ) between responses to questions about weapons and individual and family-related factors and their differences (Z).

Individual factors	1. How often did you bring a weapon to school last year?	2. How often did you assault someone with a weapon last year?	3. How often did someone assault you with a weapon during the previous school year?	$Z_{1,2}$	$Z_{2,3}$	$Z_{1,3}$
Peer violence						
Perpetration of physical violence	.41***	.38***	.28***	1.04	2.46**	3.36***
Perpetration of verbal violence	.26***	.25***	.14***	0.32	2.57**	2.93**
Perpetration of relational violence	.23***	.29***	.14***	-1.95*	3.53***	2.19*
Victimization of physical violence	.27***	.21***	.44***	1.94*	-5.68***	-4.43
Victimization of verbal violence	.14***	.13***	.20***	0.32	-1.62	1.45
Victimization of relational violence	.18***	.15***	.27***	0.95	-2.82**	-2.21*
Aggressiveness						
Vengefulness	.25***	.23***	.24**	0.65	-0.24	0.25
Dominance	.22***	.23***	.18***	-0.32	1.17	0.98
Anger	.18***	.19***	.11**	-0.32	1.85	1.69
Hostility	-.03	-.12**	-.05	2.82**	-1.60	0.48
Empathy						

Affective empathy	-.14***	-.12**	-.07	-0.63	-1.15	-1.68
Cognitive empathy	-.19***	-.25***	-.17***	1.93*	-1.88	-0.49
Coping strategies						
Adult support	-.002	.06	.04	-1.94*	0.46	-1
Distancing	-.08*	-.05	-.07	-0.94	0.46	-0.24
Problemsolving	-.11**	-.10**	-.12**	-0.31	0.46	0.24
Revenge seeking	.30***	.26***	.26***	1.31	0	1
Passive coping	.04	.07	.08*	-0.94	-0.23	-0.95
Supportive attitudes towards violence	.26***	.24***	.18***	0.65	1.41	1.96*
Family-related factors						
Father's education level	-.13***	-.11**	-.10**	-0.63	-0.23	-0.72
Mother's education level	-.04	-.05	-.08*	0.31	0.69	0.95
Number of children in the family	-.001	.01	-.02	-0.34	0.68	0.45
Birth order	.02	.01	.05	0.31	-0.91	-0.71
Perception of family's financial status	-.02	.03	.02	-1.56	0.23	-0.95

***, $p < .001$, **, $p < .01$, * $p < .05$.

Family-Related Factors

Concerning family-related factors, a father's education level has consistent negative correlations with the responses to all three questions, while a mother's education level has a negative correlation with being a victim of assault with a weapon (Table 2). Other family-related circumstances – whether the pupil lives with both parents or not (all U tests have $p > .05$) and financial status (Table 2) – are not significantly related to the responses to all three questions. Also, there are no significant differences in the correlations between family-related factors and responses to individual questions about weapon (Table 2, Z tests).

School-Related Factors

Differences related to pupils' grade were identified only in the case of assaulting with a weapon ($K-W_{(2)}=8.896$, $p=.012$), which is more common among pupils in lower grades. There are significant differences in the responses to all three questions in relation to the type of school, as pupils attending vocational schools more often carry a weapon ($U=35061.50$, $p<.001$), assault someone with a weapon ($U=35244.50$, $p<.001$) and are victims of assault with a weapon ($U=35744.50$, $p<.001$) compared to grammar school pupils. Academic performance is negatively related to the responses to all three questions (Spearman's ρ rank correlation coefficients are $-.22$, $-.20$ and $-.20$ and all are significant at $p<.001$ level), i.e., pupils with poor academic performance are more likely to assault with a weapon and be victims of assault with a weapon. There are no significant differences in the correlations between academic performance and individual questions about weapon (Z tests range from 0 to -0.64).

Prediction of Weapon Carrying and Assault with a Weapon in School Based on Individual and Contextual Factors

We conducted two ordinal regression analyses in order to gain better insights into the correlates of weapon carrying and assault with a weapon. In the prediction of weapon carrying, the set of 28 predictors explained from 25% (Cox and Snell) to 45% (Nagelkerke) of criteria variables. The significant positive predictors are physical violence perpetration ($B=0.26$, $p<.001$), passive coping ($B=1.52$, $p=.026$), attitudes towards violence ($B=0.79$, $p=.043$), and mother's education ($B=0.91$, $p=.004$), while negative are active problem-solving ($B=-1.10$, $p=.023$), father's education ($B=-0.83$, $p=.016$), and complete family ($B=-1.05$, $p=.033$), meaning that pupils who carry a weapon are more often from incomplete families. In the prediction of assault with a weapon, predictors explained from 28% (Cox and Snell) to 62% (Nagelkerke) of criteria variable. The significant positive predictors are physical ($B=0.42$, $p<.001$) and relational violence perpetration ($B=0.27$, $p=.047$) and mother's education ($B=1.74$,

$p=.002$), while negative predictors are verbal violence victimization ($B=-0.44$, $p=.034$), distancing ($B=-4.57$, $p=.002$), and father's education ($B=-2.54$, $p=.003$). Considering the large amount of predictors in the model, the results of these analyses should be taken with caution. Correlations of individual factors are shown in Table 6 in the Appendix while contextual factors generally have low correlations with other factors, except for the correlation between parents' education (.59).

Differences Between Pupils who Carried a Weapon and Those Who Assaulted With a Weapon in School

Based on the responses to the questions about weapon carrying and assaulting with a weapon, two groups of pupils were distinguished: 1) pupils who only carried weapons but did not assault with them ($n=30, 4.6\%$), and 2) pupils who assaulted with weapons ($n=53, 8.2\%$). By testing the differences between these groups, it was found that pupils who assaulted someone with a weapon had higher scores for all forms of violence (physical: $U=387.50$, $p=.001$; verbal: $U=561.50$, $p=.026$; relational: $U=411.50$, $p=.001$) and dominance ($U=561$, $p=.046$), and lower scores for cognitive empathy ($U=511.50$, $p=.007$) and hostility ($U=524.50$, $p=.00$) compared to pupils who carried weapons, but had not assaulted anyone until then. There were no significant differences in other questionnaire variables ($p>.05$). Due to the insufficient number of female pupils, the testing of gender differences was not adequate.

There were no significant differences in family-related factors ($p>.05$). Among school-related factors, there were no significant differences in academic performance ($p>.05$), but there were significant differences in pupils' grades ($\chi^2_{(2)}=6.06$, $p=.048$): second grade and third grade pupils more often assaulted with weapons, while fourth grade pupils more frequently carried weapons to school. Since the number of pupils attending grammar schools was insufficient, testing in relation to the type of school was not adequate.

DISCUSSION

The results of our research show that the significant individual factors of weapon carrying to school include: being a male, perpetrating and being a victim to all forms of peer violence, vengefulness, dominance, anger, lack of empathy, seeking revenge, and limited use of active problem-solving as a coping strategy. Significant contextual factors include: a lower level of father's education, lower grades, attending vocational school, and poorer academic performance. All of these factors are determined as significant also for pupils assaulting with weapon, but assaulting with weapon is more associated with perpetration of relational violence, hostility (negative) and

cognitive empathy (negative), and less associated with being a victim of physical violence. This was also confirmed in regression analysis, showing that a tendency towards peer violence, but low victimization is associated with assaulting with a weapon, along with low distancing as a coping strategy. These results indicated active violent tendencies in those who assaulted someone with a weapon. On the other hand, carrying a weapon could be predicted as a tendency towards violence, positive attitudes about violence, passive coping, and limited active problem-solving. Therefore, carrying a weapon is more associated with maladaptive coping mechanisms of avoidance, suggesting a vulnerable structure.

In addition, an important result is that bully victims carry weapon more frequently compared to bullies and victims, but they attack with weapons just as much as bullies. This finding indicates that bullies have a firmer intention to harm others compared to bully-victims. This result is consistent with previous meta-analyses which found that bully victims are a risk group for weapon carrying (e.g., Valdebenito et al., 2017; van Geel et al., 2014). Bully victims are characterized by risk factors of both bullies and victims, so we can say that they bear multiple risks. In a meta-analysis (Cook et al., 2010) it was shown that low level of social competence is more typical of bully victims than of other roles involved in violence. Thus, it is possible that members of this group more commonly resolve conflicts by perpetrating violence, so they see using a weapon as an instrument for conflict resolution.

Based on the obtained differences in the correlates of weapon carrying and assaulting with weapon, it seems that weapon carrying to school can be explained by the vulnerability hypothesis, since weapon carrying is more related to being a victim of violence. However, identification of the bully victim role as bearing the highest risk for weapon carrying to school indicates that being a victim is not a risk factor itself, but it is a combination of bullying and victimization. The result obtained by comparing pupils who carried weapon to school but did not assault with them, and those who assaulted someone with weapons, is particularly important as it indicates that propensity for violence and dominance, along with lack of cognitive empathy and hostility, are the key factors required to assault with weapons. These results reveal that assaulting with weapon can be explained by the antisocial profile hypothesis. Lack of empathy is one of the key factors of perpetrating peer violence and being a bully victim, while it is not associated with victimization (Zych et al., 2019). The lack of insight into the emotional states of others, including the consequences of one's violent behavior, in a certain way makes it easier to act without feelings of guilt and remorse. In addition, a dimension of aggressiveness – dominance includes one's need to exercise power, quarreling, and lack of controlling behavior triggered by perceived provocation (Dinić et al., 2014) and it is more associated with reactive aggression (Dinić & Raine, 2020). Previous research showed that quarreling while intoxicated is a common risk factor for weapon carrying and assaulting with weapon in both boys and girls (Thurnherr et al., 2006), indicating that some form of lack of

control together with conflictive behavior constitute a risk factor. It is interesting that hostility is lower among pupils who used weapons. Hostility is singled out as a key mediator of transition from the role of victim to the role of bully (Walters & Espelage, 2018), so the obtained result indicates that weapons, when used, are used for assault rather than defense. Accordingly, we can say that the distinguishing characteristics of using weapon versus weapon carrying are the lack of understanding other people's emotions and the need for power manifested in impulsive, quarrelsome behavior.

The findings are not consistent with studies in which family-related factors proved to affect weapon carrying (e.g. Kulig et al., 1998; March & Williams, 2007). The only factor from the family domain which had a significant connection with carrying and using weapon was lower level of father's education. Bearing in mind that the role models for using weapon are male family figures (Langman, 2009), a father's lower education level may be associated with lack of awareness that the availability of weapon to adolescents is a safety risk. In future research, the role of family dynamics and attitudes towards carrying and using weapon should be more closely examined.

The research has several limitations. First, the research did not examine the type of weapon carried or used by pupils (a knife or a firearm). As the frequency of carrying and using weapon is generally low, we wanted to include all potential safety risks in the research, not only one type, for example carrying a gun. However, some previous studies indicated that self-defense is a more common motivation for carrying a knife, while assaulting is a more common motivation for carrying a gun (Saukkonen et al., 2016), so it is suggested that future studies take into account the type of weapon as well. Second, the research was conducted on the convenient sample including only urban area, assuming that assaults with weapons are more likely to happen in urban areas. In future research, it is suggested to include students from other, less urban areas. Third, the reliabilities of some scales are low (e.g., hostility and distancing), so conclusions about them should be taken with caution. Fourth, the study was conducted in 2014, and it is possible that the prevalence of weapon carrying is not the same now. Fifth, although the research has covered many factors, it is possible that factors not included in this study are also significant correlates of weapon carrying in schools. Therefore, the typology of pupils who carry weapon and/or used weapon at school is complex as the samples are small and highly variable, so it is difficult to predict future behavior, such as shootings in school. An attempt at a typology, based on the analysis of 11 pupils, was offered by Langman (2009) and it includes the traumatized, psychotic, and psychopathic types of school shooters. The main differences between these types are in family characteristics and role models among family members, the availability and fascination with weapon, having symptoms such as paranoia, and the influence of antisocial peers. Therefore, future studies should focus more on contextual protective factors that were insufficiently explored in this research.

In conclusion, the results provide more support to an approach that pupils bring weapon to school to defend themselves or to respond to perceived assaults or threats, which may not be real. According to the results, weapon carrying to school should be prevented by developing constructive and active coping strategies, and creating environment intolerant to violence. Attitudes towards school violence are part of the school climate, but also of a wider community and culture, so such prevention programs should start at an early age. However, results also show that whether a weapon will be used is more related to the intention to hurt others stemming from stronger inclination towards violence, lack of insight into emotional states of others and the need for dominance and power. All these characteristics could be used for screening and prevention programs that should include pupils who show these tendencies. Moreover, targeted and planned programs should be implemented, with a focus on building capacity for adaptive coping, conflict-resolution strategies, and social skills among vulnerable adolescents. In addition, emphasis on empathy capacities and encouragement in achieving personal goals that are not related to dominating others should be targeted among those who manifest antisocial tendencies. Both approaches will benefit from the creation of a safe and inclusive school environment that values teamwork and collaboration over competition and in which mechanisms for reporting concerns about pupils' safety are well-established. Furthermore, it is necessary to improve communication between parents and schools in order to keep parents informed and include them into peer violence prevention programs.

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Appendix 1.
Table 6. Intercorrelations among individual factors

	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	.54	.56	.27	.48	.27	.28	.36	.30	.03	-.20	-.24	.40	-.03	-.04	-.07	.40	.03
2	1	.46	.26	.30	.38	.27	.22	.24	.14	-.04	-.12	.11	-.06	.01	.04	.17	.15
3		1	.41	.28	.22	.36	.30	.28	.17	-.25	-.14	.31	-.22	.01	-.07	.33	-.01
4			1	.58	.61	.11	.08	.07	.12	-.01	-.03	-.01	.00	.05	.04	.10	.21
5				1	.56	.10	.21	.12	.00	-.08	-.19	.20	.09	-.04	-.05	.25	.15
6					1	.19	.17	.15	.16	.07	-.01	-.00	.08	-.02	.01	.15	.21
7						1	.55	.64	.40	-.06	-.15	.28	-.12	-.05	-.10	.46	.13
8							1	.68	.28	-.25	-.23	.42	-.12	-.08	-.22	.62	-.02
9								1	.25	-.15	-.23	.35	-.08	-.04	-.15	.47	.00
10									1	.09	.20	-.05	-.18	-.01	.08	.11	.15
11										1	.36	-.38	.18	-.01	.35	-.24	.27
12											1	-.36	-.05	.07	.35	-.19	.00
13												1	-.16	-.11	-.34	.43	-.12

14		1	.05	.26	.02	.29
15			1	.25	-.02	.16
16				1	-.18	.37
17					1	.11
18						1

Note: Correlations $\geq \pm .10$ are significant at $p < .01$. 1 = Perpetration of physical violence, 2 = Perpetration of relational violence, 3 = Perpetration of verbal violence, 4 = Victimization of verbal violence, 5 = Victimization of physical violence, 6 = Victimization of relational violence, 7 = Anger, 8 = Vengefulness, 9 = Dominance, 10 = Hostility, 11 = Affective empathy, 12 = Cognitive empathy, 13 = Supportive attitudes towards violence, 14 = Adult support, 15 = Distancing, 16 = Problem solving, 17 = Revenge seeking, 18 = Passive coping.