Cite as: Banasik M, Pogrzeba D, Gierowski JK: Intelligence as a protective factor against violence in a group of incarcerated men.
Psychiatr Psychol Klin 2024; 24 (3): 202–216

Received: 27.02.2024
Accepted: 03.09.2024
Published: 31.01.2025

Marlena Banasik[1], Damian Pogrzeba[2], Józef Krzysztof Gierowski[2]

Intelligence as a protective factor against violence in a group of incarcerated men

Inteligencja jako czynnik ochronny przemocy w grupie mężczyzn osadzonych w zakładzie karnym

[1] Department of Psychology, SWPS University, Kraków, Poland
[2] Department of Psychology, SWPS University, Katowice, Poland
Correspondence: Marlena Banasik, Department of Psychology, SWPS University, al. Jana Pawła II 39A, 31-864 Kraków, Poland, e-mail: marlaa@poczta.fm

[1] Wydział Psychologii w Krakowie, Uniwersytet SWPS, Kraków, Polska
[2] Wydział Psychologii w Katowicach, Uniwersytet SWPS, Katowice, Polska
Adres do korespondencji: Marlena Banasik, Wydział Psychologii w Krakowie, Uniwersytet SWPS, al. Jana Pawła II 39A, 31-864 Kraków, e-mail: marlaa@poczta.fm

https://doi.org/10.15557/PiPK.2024.0025

ORCID iDs
1. Marlena Banasik https://orcid.org/0000-0002-5329-4984
2. Damian Pogrzeba https://orcid.org/0009-0009-0925-7981
3. Józef Krzysztof Gierowski https:///orcid.org/0000-0002-7497-1876

Abstract

Introduction and objective: The aim of the study was to determine whether the relationship between intelligence and the risk of violence, as measured by the Historical Clinical Risk Management-20, version 3 (HCR-20^{v3}), in a Polish context, aligns with the findings of international studies. In addition, the focus was on identifying moderators of this relationship. A total of 202 male inmates were involved in the study. **Materials and methods:** Data essential for statistical analysis was acquired using the HCR-20 and the Structured Assessment of Protective Factors (SAPROF) scale. **Results:** The protective role of intelligence and educational attainment was observed within the studied group. Higher intelligence levels emerged as a significant mitigating factor, correlating with reduced historical risk, clinical risk, severity of risk management, and final risk assessments among incarcerated males. Educational attainment emerged as a significant moderator, influencing the association between intelligence levels and the following scales: historical risk, risk management, and final risk assessment. **Conclusions:** The study highlighted the protective role of education as a moderator between personality disorders and clinical and final risk (case priority). It was established that the combined factors of education level and income collectively acted as substantial moderators in shaping the relationship between intelligence level and historical risk, risk management level, and final risk assessments. Understanding these moderating influences in the relationship between intelligence and violence improves the risk management process, allowing for the identification of specific protective factors tailored to distinct categories of offenders. This insight contributes to a more nuanced and targeted approach to mitigating the risk of violence within incarcerated population.

Keywords: risk factors, offenders, intelligence, protective factors, violence risk

Streszczenie

Wprowadzenie i cel: Celem badania było ustalenie, czy analiza powiązań pomiędzy inteligencją a ryzykiem przemocy mierzonym skalą Historical Clinical Risk Management-20 (HCR-20^{v3}) na gruncie polskim dostarczy wyników spójnych z wynikami badań międzynarodowych. Dodatkowo skupiono się na znalezieniu moderatorów tej relacji. W badaniu wzięło udział łącznie 202 osadzonych płci męskiej. **Materiał i metody:** Do uzyskania danych niezbędnych do analizy statystycznej wykorzystano skale HCR-20 oraz Structured Assessment of Protective Factors (SAPROF). **Wyniki:** W badaniu stwierdzono ochronną rolę inteligencji i poziomu wykształcenia w badanej grupie. Wyższy poziom inteligencji okazał się istotnym czynnikiem ochronnym, korelującym ze zmniejszonym ryzykiem historycznym, ryzykiem klinicznym, surowością zarządzania ryzykiem i ostateczną oceną ryzyka wśród osadzonych mężczyzn. Poziom wykształcenia uznano za istotny moderator wpływający na związek pomiędzy poziomem inteligencji a niższym poziomem ryzyka historycznego, zarządzania ryzykiem i końcowej oceny ryzyka. **Wnioski:** Badanie wykazało ochronną, moderującą rolę edukacji w zakresie związku między zaburzeniami osobowości a ryzykiem klinicznym i ostatecznym (priorytet przypadku). Ustalono, że wykształcenie

i dochody łącznie pełnią funkcję istotnych moderatorów w kształtowaniu związku pomiędzy poziomem inteligencji a ryzykiem historycznym, poziomem zarządzania ryzykiem i ostateczną oceną ryzyka. Wiedza o moderatorach relacji inteligencja – przemoc usprawnia proces zarządzania ryzykiem, umożliwiając identyfikację konkretnych czynników ochronnych dostosowanych do różnych kategorii przestępców. Poczynione spostrzeżenia mogą przyczynić się do stosowania bardziej zróżnicowanego i ukierunkowanego podejścia w procesie minimalizacji ryzyka przemocy wśród osadzonych.

Słowa kluczowe: czynniki ryzyka przemocy, sprawcy, inteligencja, czynniki ochronne, ryzyko przemocy

INTRODUCTION

The concept of protective factors

In the literature on forensic psychology, the earliest and most numerous studies examining the role of protective factors in the context of the likelihood of disclosing violent behaviours focus on juveniles. Not surprisingly, diagnostic tools developed with this population in mind were the first to offer professionals the opportunity to assess the presence and severity of protective factors. Borum et al. (2002), creators of the Structured Assessment of Violence Risk in Youth scale (SAVRY), designed for diagnosing juveniles, identified six protective factors against violence, including a strong commitment to school/work. In 2007, the first structured scale to assess protective factors in the adult population was published. A decade later, this scale – Structured Assessment of Protective Factors (SAPROF) (de Vogel et al., 2012) was officially translated into Polish. However, until now, neither the concept of protective factor analysis in adults nor the assessment procedure proposed by de Vogel et al. (2012) in SAPROF, despite its solidly proven usefulness, has gained significant popularity in Poland. The authors of the scale define a protective factor as "any situation, characteristic of a person, or his/her environment, that reduces the risk of future (including sexual) violence" (de Vogel et al., 2012, p. 25). It should be noted that, in the psychological and psychiatric literature, protective factors are still not uniformly recognised. Researchers conceptualise them as either the absence of risk factors, the opposite of risk factors, or separate variables, not all of which have a corresponding risk factor (de Vogel et al., 2012). The most common frameworks describe three theoretical models explaining the impact of protective factors on the risk of violence:

- direct influence: the presence of protective factors, without considering the impact of other variables, is sufficient to reduce the probability of future violent acts;
- buffering influence: the strength of the influence depends on its interaction with the co-occurring risk factors;
- mediation: the protective factor acts as a mediator directly influencing the risk factor (cf. Fitzpatrick, 1997; Jessor et al., 2003; Lösel and Farrington, 2012; Turbin et al., 2006).

However, these doubts do not hinder the dynamic development of research dedicated to the prediction and management of violence risk with consideration of protective factors. The goal of the researchers' work is, on the one hand, to identify factors that can serve as targets for specialised interventions against perpetrators, and on the other hand, to find examples of effective interventions that minimise deficits and strengthen the resources of violent perpetrators.

Intelligence in relation to violence and crime

The purpose of this paper is to describe and explain the links between the level of intelligence, understood as a protective factor, and the severity of the risk of violence in a group of male prison inmates. Studying the links between violence, criminal activity, and IQ is not a new idea. Theoretical and empirical studies on the subject were published as early as the 1970s. Hirschi and Hindelang (1977, as cited in Diamond et al., 2012) reviewed the literature in this area, concluding that intelligence is important in predicting individual inclination to exhibit criminal behaviour in the general population. Psychological and criminological studies tend to conclude that there is a well-validated negative association between intelligence and criminality, both at the individual and macro levels, regardless of the age, race, gender, or socioeconomic status of the offenders studied (Diamond et al., 2012). Mears and Cochran (2013), on the other hand, postulated that the relationship is curvilinear, which they were able to prove empirically. In their view, understanding the relationship between the variables in question as linear could potentially lead to errors, resulting in an underestimation of its strength. Other researchers, such as Jensen (1998, after Mears and Cochran, 2013) and Lindsay and Taylor (2010, after Mears and Cochran, 2013), have also described the relationship between intelligence and crime in a similar way, but their hypothesis of a curvilinear relationship has not been subjected to rigorous empirical analysis. In a study by Mears and Cochran (2013), subjects with moderate levels of intelligence had higher rates of delinquency compared to those with very low (1st decile, IQ = 77–83) as well as very high (10th decile, IQ = 120–130) intelligence levels. In their view, the ability to commit or the decision to commit a crime requires a certain "baseline" level of intellectual performance. This makes it clear that respondents from the lowest decile rarely turned out to be perpetrators. Respondents from the highest decile potentially have the most to gain from crime (high financial gains, social status), but at the same time, they have the most to lose, resulting in few perpetrators in this population as well. In contrast, the middle IQ group has a correspondingly high level of intelligence to engage in crime, which, combined with significantly lower costs compared to those with higher IQs, leads to higher crime rates.

Project	Authors	Findings
Philadelphia Biosocial Project	Denno (1990)	Low verbal and performance IQ at ages 4 and 7, and low scores on the California Achievement Test at ages 13–14, all predicted arrests for violence up to age 22
Project Metropolitan in Copenhagen	Hogh and Wolf (1983)	Low IQ at age 12 significantly predicted police-recorded violence between ages 15 and 22
Pittsburgh Youth Study	Mauguin and Loeber (1996)	Low verbal IQ led to school failure and subsequently to delinquency in African-American boys
-	McGloin and Pratt (2003)	Low IQ linked to early onset and persistence of criminal behaviour
-	Piquero and White (2003)	Cognitive abilities are an important factor differentiating respondents who reveal problems with the law only in adolescence from those who commit crimes throughout their lives
-	Stattin and Klackenberg-Larsson (1993)	Early occurrence of reduced language skills (approximately at age 3) is a factor associated with later school problems and contributing to delinquency in adulthood

Tab. 1. Selection of longitudinal studies analysing the relationship between intelligence/school achievements and violence (based on: Farrington et al., 2012; McGloin and Pratt, 2003; Piquero and White, 2003; Stattin and Klackenberg-Larsson, 1993)

Findings from longitudinal studies

Farrington et al. (2012) are of the opinion that low IQ, as a significant predictor of offending, is difficult to separate clearly from low school achievement. The two variables show a strong relationship and can effectively predict delinquency, as confirmed by numerous longitudinal studies. Selected examples of longitudinal studies analysing the intelligence/school achievement-violence relationship are presented in Tab. 1.

Murray et al. (2018), based on their literature review, cite data indicating that low IQ and poor academic performance are empirically validated predictors of antisocial behaviour in high-income countries (HICs). At the same time, few analogous analyses have been conducted to date in low- and middle-income countries (LMICs). The sparse date available from China, Mauritius, Poland, South Africa, and the Philippines do not allow consistent conclusions to be drawn.

Many interpretations of the mechanism linking low intelligence to crime can be found in the literature, reflecting the consensus of researchers in this area (Jolliffe and Farrington, 2010).

One interpretation refers to the low ability to use abstract concepts. Difficulties in this area, observed in people with low IQ, are associated with a reduced ability to predict the consequences of behaviour, which promotes delinquency. Farrington et al. (2012) noted that perpetrators tend to present higher levels of performance in tasks based on nonverbal material than in verbal tests, confirming that they are better at manipulating concrete objects than abstract concepts.

According to some authors, low IQ and poor school achievement, as well as impulsivity or attentional problems, may stem from underlying executive function deficits. These include, but are not limited to, sustaining attention and concentration, abstract reasoning, concept formulation, goal formulation, anticipation, and planning (Farrington and Welsh, 2007, as cited in Mears and Cochran, 2013; Farrington et al., 2012).

McGloin et al. (2004, as cited in Mears and Cochran, 2013) link low intelligence and poor school achievement to the formation of delinquent peer groups and insufficiently functioning self-control, which explains the ease of engaging in illegal activities.

Intelligence as a protective factor

Ttofi et al. (2016) confirmed the protective role of intelligence in the context of violence, based on an extensive meta-analysis of 15 longitudinal studies. According to them, moderators of the relationship between intelligence and crime include level of school achievement, self-control or motivation to change, among others. The protective role of intelligence can be amplified by the simultaneous presence of other individual and environmental protective factors. Moreover, children who perform well academically, with high problem-solving skills, do better and/or recover more efficiently from chronic adversity than children lacking such resources – indirectly proving the buffering role of intelligence (Ttofi et al., 2016).

Intelligence and personality disorders

Sánchez de Ribera et al. (2019) conducted a meta-analysis of 94 studies to determine the direction and strength of the relationship between intelligence and psychopathy, as well as closely related disorders from the DSM, such as antisocial personality disorder, conduct disorder, and oppositional defiant disorder. The analysis revealed a significant, though weak, negative relationship between intelligence and the overall severity of psychopathy. Further analysis of factors and aspects of psychopathy showed varied associations. For example, a weak positive relationship was found between intelligence and the severity of interpersonal traits, while a negative relationship was observed between intelligence and emotional symptoms of psychopathy. Sánchez de Ribera et al. (2019) further determined a negative relationship between intelligence and both antisocial personality disorder and conduct disorder. In contrast, intelligence was found to be positively associated with oppositional defiant disorder.

De Tribolet-Hardy et al. (2014) analysed the links between intelligence and the severity of psychopathic traits

DOI: 10.15557/PiPK.2024.0025

in perpetrators. In a group of violent offenders (n = 90) incarcerated in German prisons, they found a negative association between the severity of antisocial characteristics of psychopathy (Psychopathy Checklist-Revised, PCL-R factor 2) and spatial ability (assessed using a shortened version of the Wechsler Adult Intelligence Scale, WAIS). The data published by de Tribolet-Hardy et al. (2014) align with previous findings on adult offenders with psychopathic traits, confirming a clear impairment of spatial intelligence in this group, without concurrent deficits in verbal intelligence and general intelligence.

Etzler et al. (2023) found a weak but significant interaction effect between the antisocial behaviour of psychopathic offenders and verbal intelligence. The individuals they studied with low verbal intelligence appeared to be more likely to be convicted as a consequence of antisocial behaviour than those with higher scores in the area of verbal intelligence. The researchers speculate that people with high verbal intelligence may consciously avoid certain types of crimes that carry a high probability of arrest, such as violent crimes. This is possible if "not being convicted" appears to be a reward that the psychopathic offender actively pursues. Thus, it seems that the positive relationship between the severity of psychopathy and the severity of antisocial behaviour is moderated by the level of verbal intelligence, which differentiates "successful" offenders from those who are detected.

The presented results of empirical studies consistently point to the protective role of high levels of intelligence in the context of violence and crime. The assessment of intelligence (based on IQ) is an integral part of the process of developing an integrated risk assessment for violence (resulting from the combined use of the HCR-20^{v3} and SAPROF scales, which take into account both risk and protective factors). The described procedure is widely applied to inmates in many countries around the world. In Poland, however, the methods in question are poorly disseminated, and specialists themselves are not fully convinced to use them due to the perceived labour intensity of the study. The aim of the authors of this publication was to determine whether the relationship between intelligence and the risk of violence, as measured by HCR-20^{v3}, in the Polish context would yield results consistent with the results of the discussed international studies. In addition, the focus was on finding moderators of this relationship. Thus, based on the empirical data cited in the introduction, the study sought to analyse whether, in the studied group of Polish perpetrators, education, income stability, and the diagnosis of personality disorders shape the relationship between intelligence and the risk of violence.

RESEARCH METHODOLOGY

Research procedure and sample

The statistical analysis in this study relies on data collected between 2020 and 2023 from 212 men serving sentences in seven Polish penitentiaries during the research procedure. The final dataset included records from 202 men, with 10 records excluded due to the identification of significant outliers. The criteria for selecting the study group were male gender, the fact of serving a prison sentence of at least 6 months, and the consent to participate in the study.

Prior to the study, two analyses were conducted; the first was an exploratory study to determine the most significant predictors of violence risk (Banasik et al., 2020), and the second focused on intelligence as both a protective and risk factor in a group of forensic psychiatric inpatients (Banasik et al., 2022). The subject's age range was 18–70 years, with a mean age of 37 years (SD = 11.34). The majority (75.2%) had completed at least secondary school, while 24.8% had only completed primary or middle school. 86.6% of the participants had a fixed or temporary source of income, while 12.4% had no source of income. Personality disorders were diagnosed in 27.2% of the studied cases. 8.9% of the subjects had below-average intelligence, while 72.8% had average and 18.3% above-average intelligence.

The research data were obtained and anonymised after obtaining informed consent from the felons. The final assessment of violence risk (case priority) was based on the extramural context to reflect the level of risk after serving the sentence. The research procedure consisted of the following steps: 1. Conducting interviews with the respondents; 2. Analysing interview transcripts using the HCR-20^{v3} and SAPROF guidelines to assess risk factors, the protective factor (intelligence), and formulate the case priority judgement; 3. Data entry and statistical analysis in IBM SPSS Statistics v.29.

Research tools

The data essential for statistical analysis was acquired through the following methods:

1. HCR-20^{v3}

HCR-20 represents a widely utilised structured professional judgment (SPJ) tool within the field of violence risk assessment for adults. The current iteration, HCR-20^{v3}, is now in use (Douglas et al., 2013). Characterised as a semi-structured and comprehensive risk assessment instrument, the HCR-20^{v3} involves an in-depth interview with the subject, integrating information from diverse sources such as medical records, informant interviews, and forensic psychiatric reports (Banasik, 2015). Comprising three scales – historical, clinical, and management of future violence risk – the HCR-20^{v3} encompasses a total of twenty risk factors.

The assessment process follows a seven-step procedure: information gathering, determining the presence and relevance of risk factors, risk formulation, development of risk scenarios, devising a risk management plan, and concluding with a summary rating of risk. Reliability testing of the HCR-20^{v3} was conducted through expert-rater methods, involving the evaluation of thirty-two forensic patients.

The results demonstrated high conformity of assessments across subscales (0.82–0.93) and satisfactory internal reliability (0.60–0.80) as assessed by Cronbach's alpha (Douglas and Belfrage, 2014). The widespread deployment of HCR-20^{v3} spans various settings, including determining the level of security required for the studied subject and setting therapeutic goals for psychiatric wards patients.

2. SAPROF

SAPROF is a scale utilised for evaluating protective factors, and its second edition was translated into Polish in 2016 (de Vogel et al., 2016). Often employed in conjunction with HCR-20^{v3}, SAPROF is specifically designed to incorporate protective factors into the assessment of violence risk. The administration of SAPROF involves a thorough interview, encompassing the analysis of medical documentation, forensic psychiatry reports, and background surveys. Developed by experts at Van der Hoeven Kliniek in Utrecht, Pompekliniek in Nijmegen, and Maastricht University, is applicable for assessing protective factors in individuals with a history of sexual and physical violence. Comprising three scales – internal factors, motivational factors, and external factor – with a total of 17 items, assessors are tasked with coding these items to identify key protective factors present in the patient and pinpoint areas requiring further therapeutic attention. While demonstrating good internal reliability and validity, it is important to note that these characteristics pertain specifically to surveys conducted with male populations.

One year post-assessment, the validity coefficient of the scale stood at 0.85 for physical violence and 0.83 for sexual violence, decreasing slightly to 0.74 and 0.77, respectively, after three years. When combined with HCR-20^{v3}, the validity coefficient was 0.87 after one year, decreasing to 0.76 after three years. The internal reliability of SAPROF for physical violence was 0.88, and for sexual violence, it was 0.95 (de Vogel et al., 2016).

In the present study, only the intelligence degree from the internal factors subscale of SAPROF was measured (information about IQ was obtained from personal files). This factor is classified as high if the subject demonstrates above-average intelligence (IQ ≥115), moderate if they exhibit average intelligence (IQ ≥85 and <115), or low if they demonstrate below-average intelligence (IQ <85).

Measured variable	Variable categories	Study group (N = 202)
Level of intelligence	Below average	18 (8.9%)
	Average	147 (72.8%)
	Above average	37 (18.3%)
Level of education	Elementary or middle school	50 (24.8%)
	High school/vocational school	133 (65.8%)
	Higher education	19 (9.4%)
Personality disorders presence	Diagnosed	55 (27.2%)
	Not diagnosed	147 (72.8%)
Source of income	Fixed or temporary	175 (86.6%)
	No income	25 (12.4%)
	Missing data	2 (1%)

Tab. 2. The study group by levels of intelligence, education, source of income, and diagnosis of personality disorders

3. Additional variables introduced in the research model

For each respondent, the study determined the education level (higher, secondary school/vocational school, primary/middle school) and the source of income (regular/fixed income, no income). Additionally, respondents were divided into subgroups based on the presence or absence of a personality disorder diagnosis. Detailed data are presented in Tab. 2.

Statistical analysis

The analysis of the data was conducted using IBM SPSS Statistics v.29, following the guidelines outlined in Andy Field's textbook (2018). Given that the variables of interest are ranked, Spearman's rho was employed to compute the correlations. Subsequently, a one-way analysis of variance (ANOVA) with planned comparisons was executed on independent samples. Scores on the historical, clinical, and management of future violence risk scales were treated as a continuous variable.

The presence of the HCR-20^{v3} risk factors and the intelligence protective factor from SAPROF were measured on a scale of 0 for absent, 1 for partially present, and 2 for fully present. It is crucial to note that this methodology was employed solely for statistical analysis purposes and is not a standard component of individual diagnosis using HCR-20^{v3}. The moderation effect was calculated using version 4.3 of the PROCESS macro (Hayes, 2019).

RESULTS

In all the findings presented below, the following assumptions apply:

- Intelligence level is interpreted as a protective factor according to the SAPROF scale.
- Historical risk is defined as the cumulative ratings of various risk factors on the HCR-20^{v3} historical scale.
- Clinical risk corresponds to the sum of ratings of diverse risk factors on the HCR-20^{v3} clinical risk scale.
- The Risk Management Scale is construed as the total of ratings for different items on the HCR-20^{v3} risk management scale.
- Case priority is understood as the sum of points derived from the historical, clinical, and risk management scales
- Inmates' source of income is categorised into two groups (no income, fixed/temporary income).
- Education level is divided into two categories (primary or middle school, above middle school, including vocational school, secondary school, university).

DOI: 10.15557/PiPK.2024.0025

- Personality disorders are classified into two categories (present/not present).

Effect of intelligence level on the degree of historical risk in inmates

The correlation among the examined variables within the subject population is statistically significant, negative, and weak (rho = −0.307, $p < 0.001$). Furthermore, an analysis of variance (ANOVA) for independent samples with planned comparisons was carried out. The intelligence level exhibited a significant effect on the degree of historical risk in inmates ($F(2,199) = 13.18$, $p < 0.001$). The planned contrast highlighted that a higher intelligence level significantly reduces historical risk among inmates (Fig. 1).

Effect of intelligence level on the degree of clinical risk in inmates

In the examined population, there is a statistically significant, negative, and weak correlation between intelligence level and clinical risk (rho = −0.145, $p = 0.039$). An analysis of variance (ANOVA) for independent samples with planned comparisons revealed a significant impact of intelligence level on the level of clinical risk among inmates ($F(2,199) = 4.55$, $p = 0.012$). The planned contrasts analysis led to the conclusion that a higher intelligence level significantly reduces clinical risk in felons, although this is not statistically significant for the 4th contrast (between average and above-average levels of intelligence) (Fig. 2).

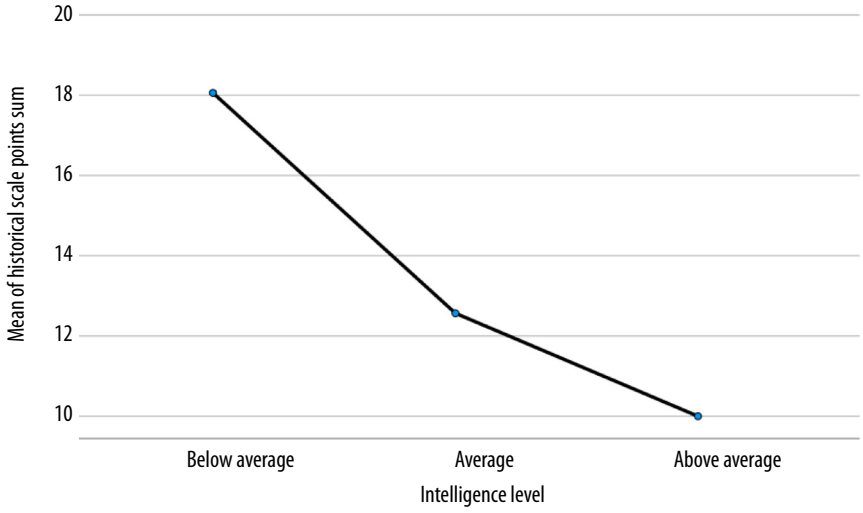

Fig. 1. The effect of intelligence level on the degree of historical risk in inmates (least squares means for the study group; N = *202)*

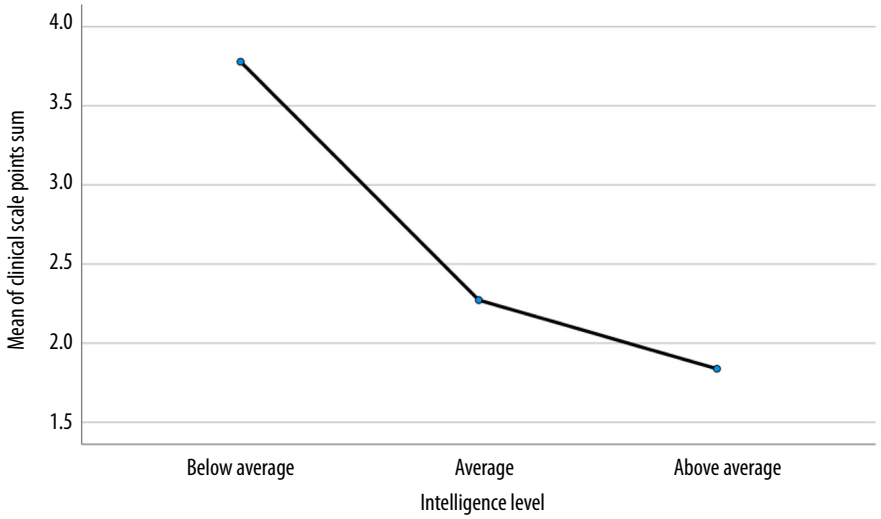

Fig. 2. The effect of intelligence level on the degree of clinical risk in inmates (least squares means for the study group; N = *202)*

 DOI: 10.15557/PiPK.2024.0025

Effect of intelligence level on the risk management scale degree in inmates

Following the analysis, it was found that the correlation between intelligence level and the risk management scale is statistically significant, negative, and weak (rho = −0.233, $p < 0.001$). Consequently, an analysis of variance (ANOVA) for independent samples with planned comparisons was executed. The outcome indicated a significant influence of intelligence level on the degree of the risk management scale among the inmates ($F(2,199) = 6.57$, $p = 0.002$). Upon conducting the planned contrasts analysis, it was concluded that a higher intelligence level significantly reduces the degree of the risk management scale in the inmates (Fig. 3).

Effect of intelligence level on the final case priority scale degree in inmates

In the studied population, there is a statistically significant, weak, and negative correlation between intelligence level and case priority (rho = −0.298, $p < 0.001$). To broaden the scope of analysis, an analysis of variance (ANOVA) for independent samples with planned contrasts was employed. The findings indicated a significant impact of intelligence level on the degree of the risk management scale among the inmates ($F(2,199) = 13.62$, $p < 0.001$). The planned contrasts analysis revealed that a higher level of intelligence significantly decreases the final case priority scale degree in the inmates (Fig. 4). For the purpose of subsequent analysis, two moderation models were used (Figs. 5, 6).

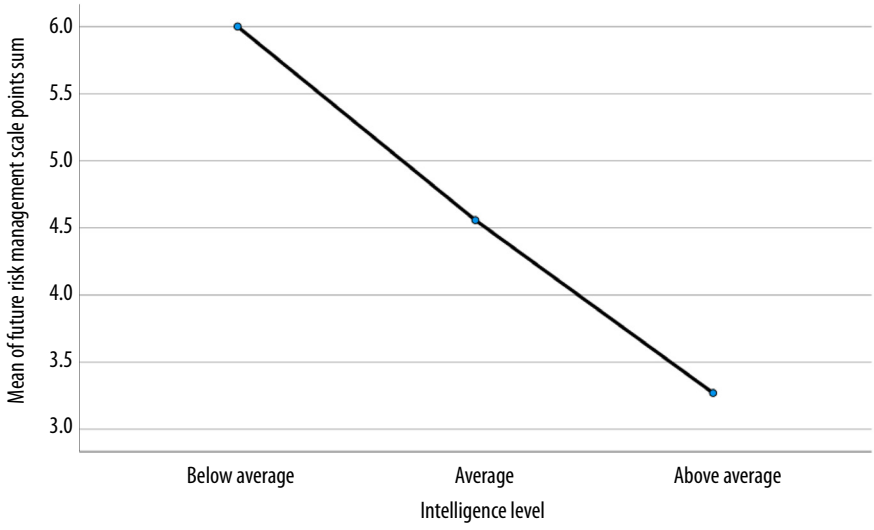

Fig. 3. The effect of intelligence level on the risk management scale degree in inmates (least squares means for the study group; N = *202)*

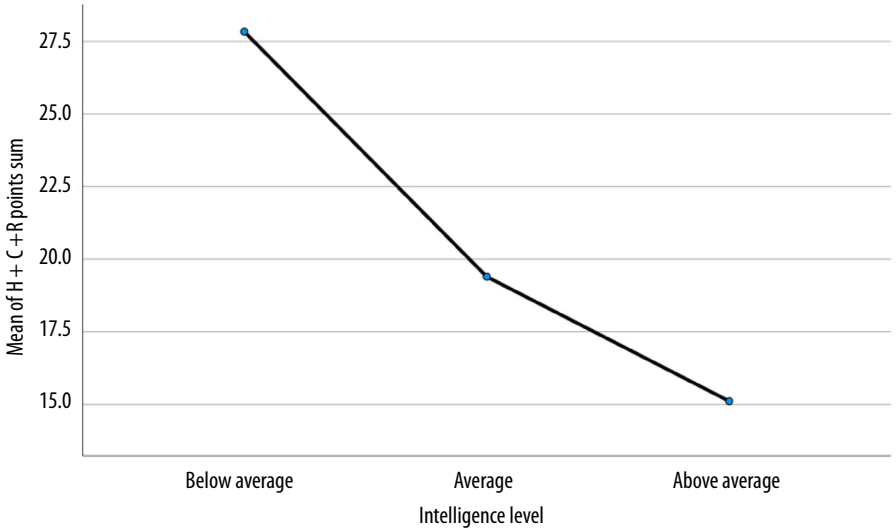

Fig. 4. The effect of intelligence level on the final case priority scale degree in inmates (least squares means for the study group; N = *202)*

DOI: 10.15557/PiPK.2024.0025

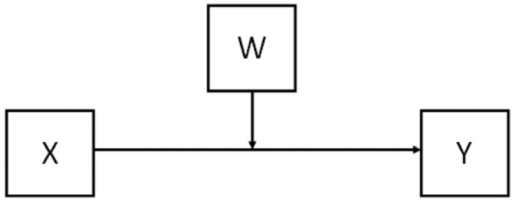

Fig. 5. Moderation model 1 (analysis 5 until 10) with one moderator

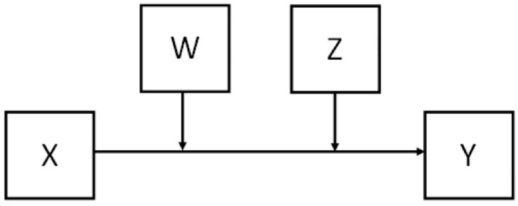

Fig. 6. Moderation model 2 (analysis 11 until 14) with two independent moderators

Moderation effect of the level of education on the relationship between intelligence and historical risk in the inmate population

To expand on the findings of the analysis, it was opted to investigate the moderating effect of education level on the relationship between intelligence and historical risk within the inmate population.
It was observed that:

- When education level is not higher than middle school, there is a non-significant, negative relationship between intelligence level and historical risk in inmates ($b = -2.11$, 95% CI [−5.44, 1.23], $t = -1.25$, $p = 0.21$).
- For those with an education level higher than middle school, there is a significant negative relationship between intelligence level and historical risk in inmates ($b = -10.86$, 95% CI [−16.22, −5.49], $t = -3.99$, $p = 0.0001$) (Fig. 7).

Moderation effect of the level of education on the relationship between intelligence and clinical risk in the inmate population

It was revealed that the level of education does not significantly affect the relationship between intelligence level and clinical risk ($p = 0.33$).

Moderation effect of the level of education on the relationship between intelligence and risk management scale degree in the inmate population

Moreover, the moderating effect of education level on the association between intelligence level and the degree of the risk management scale was examined within the inmate population.
It was observed that:

- When education level is not higher than middle school, there is a non-significant, negative relationship between intelligence level and the risk management scale degree in inmates ($b = -0.36$, 95% CI [−2.01, 1.26], $t = -0.38$, $p = 0.70$).
- For education level higher than middle school, there is a significant negative relationship between intelligence level and the risk management scale degree in inmates ($b = -4.59$, 95% CI [−7.30, −1.89], $t = -3.34$, $p = 0.001$) (Fig. 8).

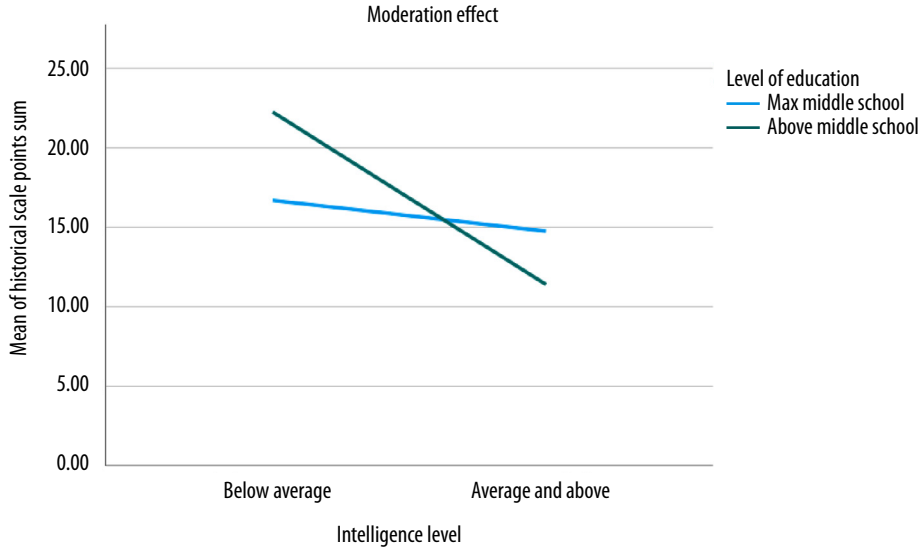

Fig. 7. The moderation effect of the level of education on the relationship between intelligence and historical risk in the inmate population (N = 202)

 DOI: 10.15557/PiPK.2024.0025

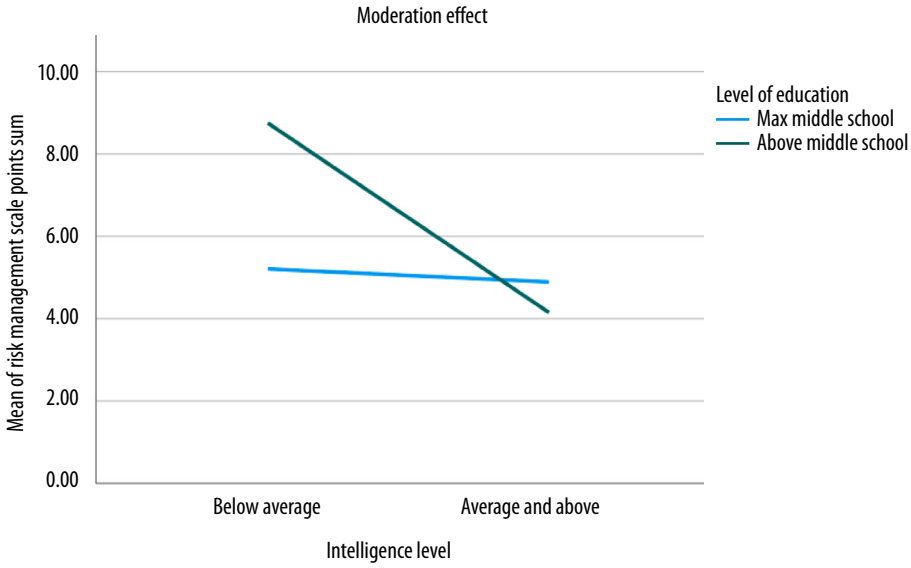

Fig. 8. The moderation effect of the level of education on the relationship between intelligence and risk management scale degree in the inmate population (N = *202)*

Moderation effect of the level of education on the relationship between intelligence and final case priority scale degree in the inmate population

Furthermore, it was examined how the level of education moderates the relationship between intelligence level and the final case priority scale degree within the inmate population. It was observed that:

- When education level is not higher than middle school, there is a non-significant, negative relationship between intelligence level and the final case priority scale degree in inmates ($b = -3.50$, 95% CI [−8.72, 1.72], $t = -1.32$, $p = 0.19$).
- For education levels higher than middle school, there is a significant negative relationship between intelligence level and the final case priority scale degree in inmates ($b = -17.84$, 95% CI [−26.24, −9.45], $t = -4.19$, $p < 0.001$) (Fig. 9).

Moderation effect of the education level on the relationship between personality the presence of disorders and clinical risk in the inmate population

Additionally, the study investigated the moderating role of educational attainment in the correlation between the presence of personality disorders and the degree of clinical risk scale within the incarcerated population.

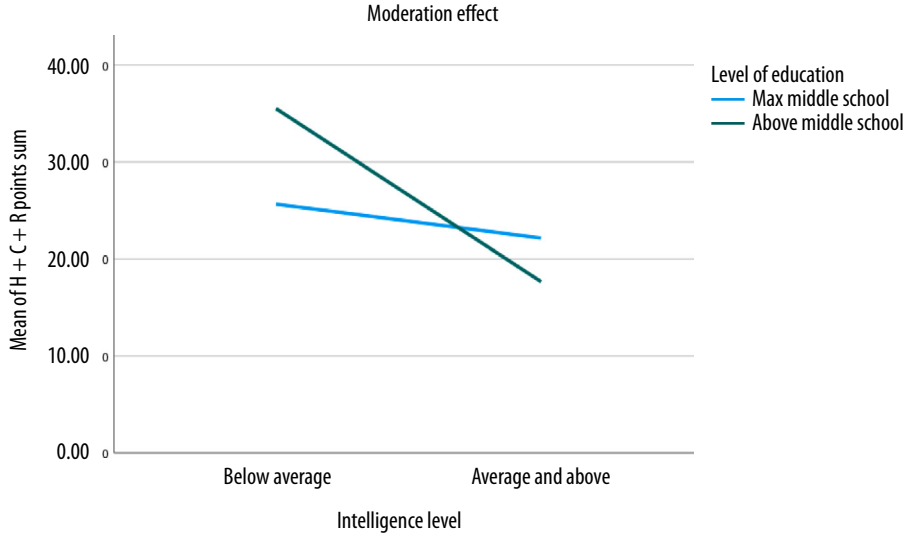

Fig. 9. The moderation effect of the level of education on the relationship between intelligence and final case priority scale degree in the inmate population (N = *202)*

DOI: 10.15557/PiPK.2024.0025

It was observed that:

- When education level is not higher then middle school, there is a significant, positive relationship between the presence of personality disorders and the clinical risk scale degree in inmates (b = 3.30, 95% CI [2.09, 4.51], t = 5.37, p < 0.001).
- For education levels higher than middle school, there is a significant positive relationship between the presence of personality disorders and the clinical risk scale degree in inmates (b = 0.89, 95% CI [0.06, 1.70], t = 2.10, p = 0.037) (Fig. 10).

Moderation effect of intelligence on the relationship between the presence of personality disorders and the final case priority degree in the inmate population

Moreover, the analysis explored the moderating impact of the educational level on the association between the presence of personality disorders and the final case priority scale degree among the inmate population.

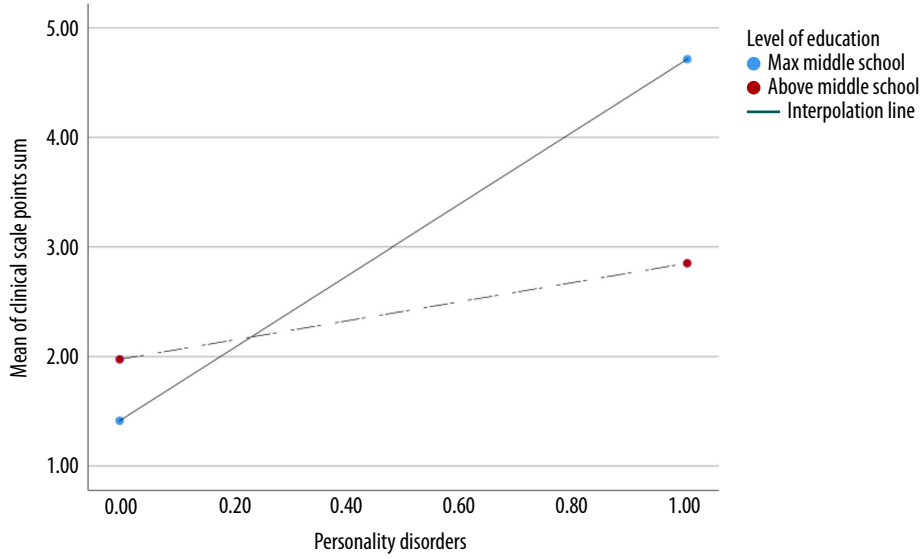

Fig. 10. The moderation effect of the education level on the relationship between the presence of personality disorders and clinical risk in the inmate population (N = 202)

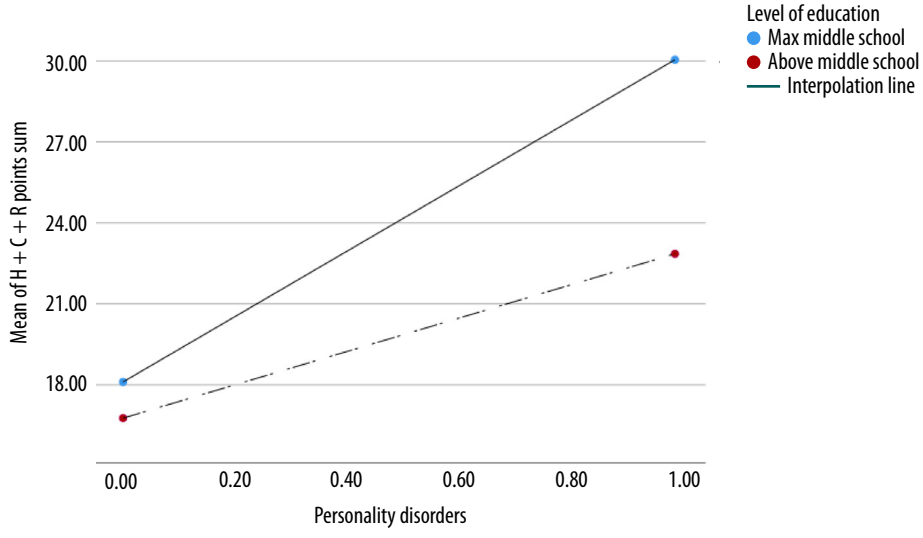

Fig. 11. The moderation effect of the intelligence level on the relationship between the presence of personality disorders and final case priority degree in the inmate population (N = 202)

 DOI: 10.15557/PiPK.2024.0025

It was observed that:

- When education level is not higher than middle school, there is a significant, positive relationship between the presence of personality disorders and the final case priority scale degree in inmates (b = 11.94, 95% CI [7.43, 16.46], t = 5.22, p < 0.001).
- For education levels higher than middle school, there is a significant positive relationship between the level of personality disorders and the final case priority scale degree in inmates (b = 6.09, 95% CI [3.02, 9.16], t = 3.91, p = 0.0001) (Fig. 11).

Moderation effect of the level of education and income on the relationship between intelligence and historical risk in the inmate population

After thoroughly analysing the preceding findings, a decision was made to test the hypothesis that the level of education and income together serve as a significant moderator of the relationship between intelligence level and historical risk in the inmate population.

It was observed that:

- When education level is not higher than middle school and income is not fixed, there is a non-significant, positive relationship between intelligence level and historical risk in inmates (b = 1.30, 95% CI [−6.51, 9.11], t = 0.33, p = 0.74).
- When education level is not higher than middle school and income is fixed, there is a non-significant, negative relationship between intelligence level and historical risk in inmates (b = −1.84, 95% CI [−5.23, 1.56], t = −1.07, p = 0.29).
- For education levels higher than middle school and no fixed income, there is a significant negative relationship between intelligence level and historical risk degree in inmates (b = −9.20, 95% CI [−15.75, −2.65], t = −2.77, p = 0.0062).
- For education levels higher than middle school and fixed income, there is a significant negative relationship between intelligence level and historical risk degree in inmates (b = −12.33, 95% CI [−18.91, −5.76], t = −3.70, p = 0.0003) (Fig. 12).

Moderation effect of the level of education and income on the relationship between intelligence level and clinical risk in the inmate population

The level of education and income together are not a significant moderator of the relationship between intelligence level and clinical risk in the inmate population (p = 0.53).

Moderation effect of the level of education and income on the relationship between intelligence level and risk management scale degree in the inmate population

The level of education and income together are not a significant moderator of the relationship between intelligence level and the risk management scale degree in the inmate population.

It was observed that:

- When education level is not higher than middle school and income is not fixed, there is a non-significant, positive relationship between intelligence level and the risk

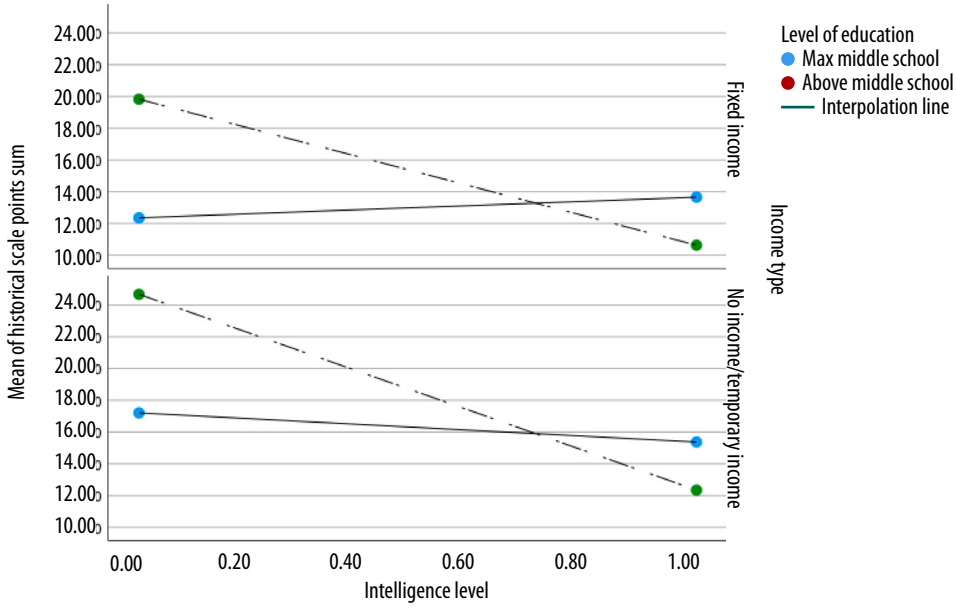

Fig. 12. The moderation effect of the level of education and income on the relationship between intelligence and historical risk in the inmate population (N = *202)*

DOI: 10.15557/PiPK.2024.0025

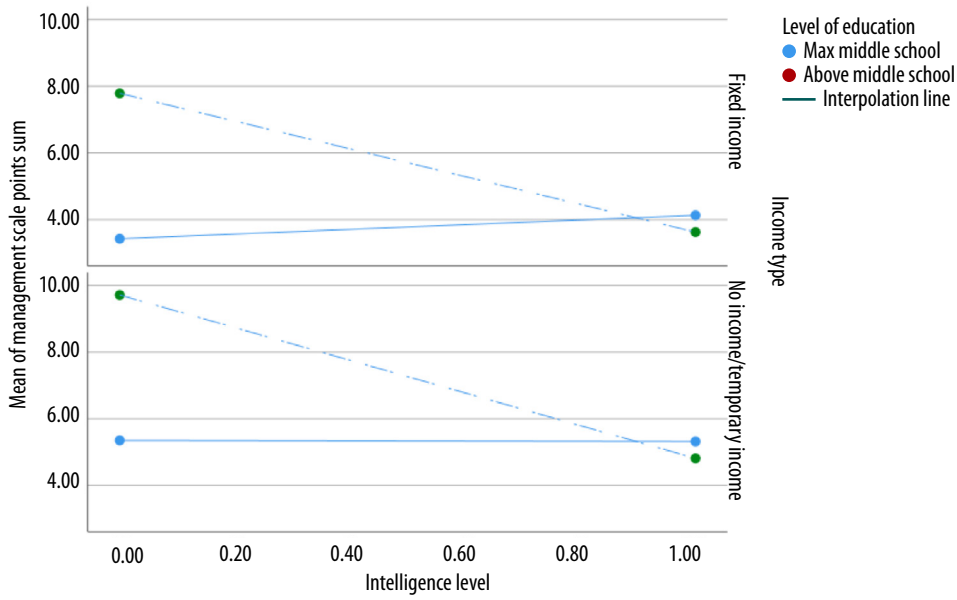

Fig. 13. The moderation effect of the level of education and income on the relationship between intelligence and risk management scale degree in the inmate population (N = *202)*

management scale degree in inmates (b = 0.70, 95% CI [−3.20, 4.61], t = 0.36, p = 0.72).

- When education level is not higher than middle school and income is fixed, there is a non-significant, negative relationship between intelligence level and the risk management scale degree in inmates (b = −0.34, 95% CI [−1.73, 1.66], t = −0.04, p = 0.97).
- For education levels higher than middle school and no fixed income, there is a significant negative relationship between intelligence level and the risk management scale degree in inmates (b = −4.16, 95% CI [−7.44, −0.89], t = −2.51, p = 0.013).
- For education levels higher than middle school and fixed income, there is a significant negative relationship between intelligence level and the risk management scale degree in inmates (b = −4.90, 95% CI [−8.19, −1.61], t = 2.94, p = 0.0037) (Fig. 13).

Moderation effect of the level of education and income on the relationship between intelligence level and final case priority degree in the inmate population

The level of education and income together are not a significant moderator of the relationship between intelligence level and case priority degree in the inmate population.
It was observed that:

- When education level is not higher than middle school and income is not fixed, there is a non-significant, positive relationship between intelligence level and the final case priority degree in inmates (b = 0.13, 95% CI [−12.06, 12.32], t = 0.02, p = 0.98).
- When education level is not higher than middle school and income is fixed, there is a non-significant, negative relationship between intelligence level and the final case priority degree in inmates (b = −2.82, 95% CI [−8.12, 2.47], t = −1.05, p = 0.29).
- For education levels higher than middle school and no fixed income, there is a significant negative relationship between intelligence level and the final case priority degree in inmates (b = −16.20, 95% CI [−26.43, −5.98], t = −3.12, p = 0.0021).
- For education levels higher than middle school and fixed income, there is a significant negative relationship between intelligence level and the final case priority degree in inmates (b = −19.15, 95% CI [−29.41, −8.89], t = −3.68, p = 0.0003) (Fig. 14).

DISCUSSION

First, the association between intelligence level and the severity of historical risk, clinical risk, risk management, and final risk assessment was analysed with the help of HCR-20^{v3} (case priority). Significant, weak, and negative associations between intelligence and the aforementioned types of risk were recognised. Numerous psychological and criminological studies provide similar insights, regardless of the age, race, gender, and socioeconomic status of the offenders studied (Diamond et al., 2012). The results of the conducted analysis of variance are also consistent with these findings. Based on them, it was established that higher levels of intelligence significantly reduce historical risk, clinical risk, severity of risk management, and final risk assessment among inmates. Thus, the protective role of intelligence in shaping the level of violence risk was confirmed.

 DOI: 10.15557/PiPK.2024.0025

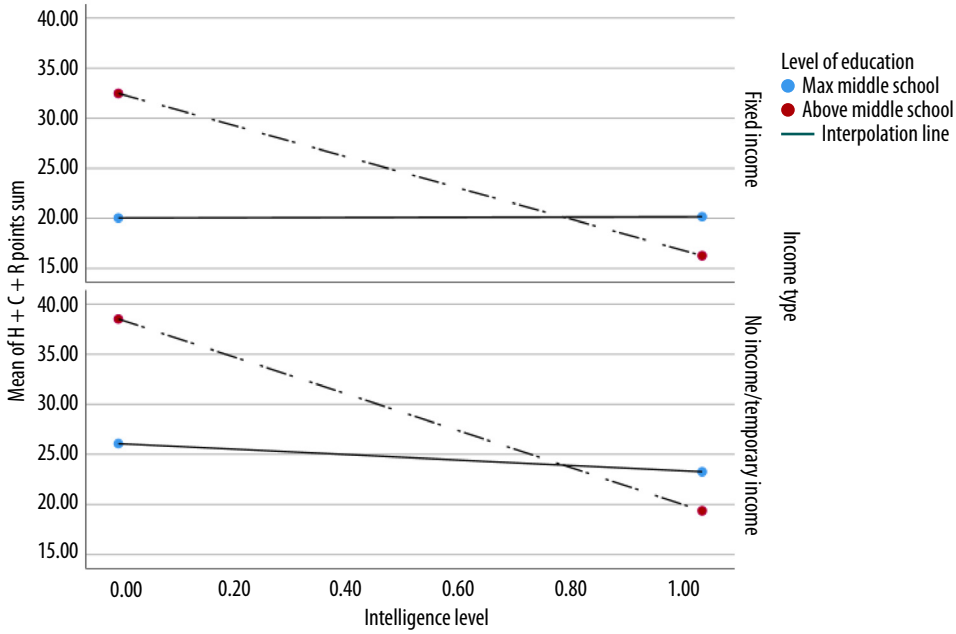

Fig. 14. The moderation effect of the level of education and income on the relationship between intelligence and final case priority degree in the inmate population (N = *202)*

Second, it was analysed whether the level of education moderates the relationship between the level of intelligence and the risk of violence in the inmate population. The results of the analyses confirmed that the level of education moderates the relationship between intelligence level and historical risk, level of risk management, and final risk assessment. In each of the above-mentioned cases, a significant negative relationship between the level of intelligence and the level of risk (historical, risk management, and final assessment) was observed in the male subjects with education beyond middle school. The obtained results are consistent with the findings of Ttofi et al. (2016), who identified the level of school achievement as one of the moderators of the intelligence-crime relationship. In the longitudinal studies they cited, both school competency test scores, cognitive abilities, and school failure, including dropping out of school, were considered indicators of school performance. In this context, it is worth recalling that according to the provisions of educational law in Poland, compulsory schooling lasts until the completion of primary school, but no longer than until the age of 18. Difficulties in the implementation of this obligation thus trigger a response from the state, whether the source is problems in the student's cognitive functioning, their anti-social behaviour, issues with parental authority, or the unfavourable socioeconomic situation of the family. Not surprisingly, primary/middle school education does not moderate the relationship between intelligence and violence. The group of respondents with primary/middle school education is highly internally differentiated in terms of intelligence level, risk of violence, and their interrelationships. It is likely that only at later stages of education, no longer under institutional control, do the consequences of the respondents' low levels of intelligence, such as insufficiently functioning self-control, may become more apparent. McGloin et al. (2004, as cited in Mears and Cochran, 2013) explain the ease of engaging in illegal activities in this way. Educational level, on the other hand, did not prove to be a significant moderator of the association between intelligence level and clinical risk in the study group. Consequently, clinical observations and literature analysis led the authors to look for additional factors shaping this relationship. They decided to consider, in addition to the level of education, the diagnosis of a personality disorder. The level of education was found to be a significant moderator of the relationship between the presence of a personality disorder and the level of clinical risk and final risk assessment. The protective role of education was shown in terms of the relationship between the absence of a personality disorder and risk: clinical and final (case priority). Conversely, the diagnosis of a personality disorder combined with primary/middle school education constitutes a factor that increases risk (final and clinical). Similar observations were made in a group of psychiatric patients. Banasik et al. (2022) found that the presence of personality disorders, in addition to psychotic disorders, increased clinical risk in individuals with average and above-average intelligence. These results support the conclusion that both patients and inmates with personality disorders, despite being highly intelligent and educated, represent a particularly difficult group in terms of cooperation and therapy. This, consequently, can translate into high clinical risk. Interactions undertaken by staff, in the absence of the patient's involvement or when confronted with manipulative behaviours, are unlikely to achieve the expected effectiveness (Banasik et al., 2022). Among

DOI: 10.15557/PiPK.2024.0025

inmates, a diagnosis of a personality disorder together with no more than a middle school education also increases the final violence risk score as intelligence increases. Antisocial disorder, which is prevalent in the study group, is an important individual risk factor for violence and recidivism, which justifies the evaluators' belief that the currently observed difficulties in following rules and in interpersonal relations (clinical risk) are of an established nature and are highly likely to result in violence in the near or distant future as well (final assessment).

The few and inconsistent findings of previous studies analysing the relationship between intelligence and violence and crime in a characteristic socioeconomic context (see Murray et al., 2018) led the authors to include the income of the subjects in the analyses. However, rather than analysing the level of income, the fixed/temporary presence or absence of income in the group of inmates was noted. It was decided to determine whether education level and income – taken together – are moderators of the relationship between intelligence level and risk of violence. It turned out that education level and income together were a significant moderator of the relationship between intelligence level and: historical risk, level of risk management, and level of final risk assessment. In each of the cited analyses, it was observed that both with education higher than middle school and no fixed income, as well as with higher than middle school education and fixed income, there was a significant negative relationship between the level of intelligence and the level of risk (historical, risk management, as well as final assessment). Thus, the protective role of education higher than middle school was demonstrated, regardless of income attainment in the study group. Educational level and income analysed together, however, did not prove to be a significant moderator of the relationship between intelligence level and clinical risk in the inmate population. As explained above, the relationship between intelligence and clinical risk in the study group is shaped, in conjunction with education, by the diagnosis of personality disorders.

The results of the analyses proved the protective role of intelligence and education in the studied group of male inmates. Consequently, the suggestion by Farrington et al. (2012) that it is difficult to analyse intelligence in the context of perpetration of violence in isolation from the level of school achievement (which may be reflected in the level of education) should be considered accurate. Both variables show a strong relationship and can effectively predict delinquency (Farrington et al., 2012). The nature of the effect of protective factors on the risk of violence (direct, buffering versus mediating) remains an open question that requires further research. The results obtained do not provide support for the buffering influence hypothesis. Buffering protective factors are characterised as those that reduce the likelihood of negative outcomes in the presence of a risk factor but have less impact when the risk factor is absent (Dubow et al., 2016). In contrast, in the group of inmates studied, it was found that in terms of the relationship of intelligence with risk: clinical and final (case priority), education serves as a protective effect when combined with the absence of a personality disorder, while co-occurring with a diagnosis of a personality disorder does not. These observations align with the risk assessment model proposed within the SPJ approach (based on which HCR-20^{v3} and SAPROF were based). According to this model, for the results of the assessment of the severity of violence risk and the design of optimal corrective interventions, the analysis of their interrelationships is more important than the knowledge of the presence of individual risk factors and protective factors.

CONCLUSIONS

The analyses conducted led to the following conclusions:

- The findings proved the protective role of both intelligence and education in the studied group of male inmates.
- Higher intelligence significantly reduces historical risk, clinical risk, severity of risk management, and final risk assessment among inmates.
- Educational level was found to moderate the relationship between intelligence and historical risk, level of risk management, and final risk assessment.
- Education was shown to play a protective in the relationship between the presence of personality disorders and clinical and final (case priority) risks.
- It was confirmed that education level and income together are a significant moderator of the relationship between intelligence level and historical risk, level of risk management, and level of final risk assessment.
- Understanding the moderators of the intelligence-violence relationship can improve the risk management process by enabling the identification of protective factors specific to particular categories of offenders.

Conflict of interest

There is no conflict of interest.

Funding/Support and role of the sponsor

The study was conducted as part of the project called The Role of Risk and Protective Factors in Assessing and Monitoring the Probability of Committing a Criminal Act in Offenders Subjected to an Isolation System of Therapeutic and Protective Measures and Serving a Prison Sentence*, carried out at SWPS University and funded by NCN (OPUS 15, no. 2018/29/B/HS5/00474).*

Author contribution

Original concept of study; critical review of manuscript: MB, JKG. Collection, recording and/or compilation of data; writing of manuscript: MB, DP. Analysis and interpretation of data: DP. Final approval of manuscript: MB, DP, JKG.

References

Banasik M: Psychopatyczne zaburzenie osobowości oraz ryzyko pojawienia się przemocy na tle różnic międzypłciowych. Uniwersytet Jagielloński, Kraków 2015.

Banasik M, Pogrzeba D, Gierowski JK et al.: In search of the most important predictors of violence risk in a group of polish patients in secure forensic psychiatry units. Probl Forensic Sci 2020; 122: 111–128.

Banasik M, Pogrzeba D, Gierowski JK et al.: Intelligence as a protective factor and risk factor for violence in a group of forensic psychiatric inpatients. Probl Forensic Sci 2022; 129: 5–28.

Borum R, Bartel PR, Forth A: Manual for the Structured Assessment of Violence Risk in Youth (SAVRY). Version 1, University of South Florida, Tampa 2002.

Denno D: Biology and Violence: From Birth to Adulthood. Cambridge University Press, Cambridge 1990.

Diamond B, Morris RG, Barnes JC: Individual and group IQ predict inmate violence. Intelligence 2012; 40: 115–122.

Douglas KS, Belfrage H: Interrater reliability and concurrent validity of the HCR-20 version 3. Int J Forensic Ment Health 2014; 13: 130–139.

Douglas KS, Hart SD, Webster CD et al.: HCR-20^{v3}: Assessing Risk for Violence: User Guide. Mental Health, Law, and Policy Institute, Simon Fraser University, Burnaby 2013.

Dubow EF, Huesmann LR, Boxer P et al.: Childhood and adolescent risk and protective factors for violence in adulthood. J Crim Justice 2016; 45: 26–31.

Etzler S, Rettenberger M, Rohrmann S: A moderated mediation analysis to further examine the role of verbal intelligence in the association between psychopathic personality and crime. Int J Offender Ther Comp Criminol 2023; 67: 1509–1525.

Farrington DP, Loeber R, Ttofi MM: Risk and protective factors for offending. In: Welsh BC, Farrington DP (eds.): The Oxford Handbook of Crime Prevention. Oxford University Press, New York 2012: 46–69.

Field AP: Discovering Statistics using IBM SPSS Statistics. 5th ed., SAGE Publications Inc., London, Thousand Oaks, New Delhi, Singapore 2018.

Fitzpatrick KM: Fighting among America's youth: a risk and protective factors approach. J Health Soc Behav 1997; 38: 131–148.

Hayes AF: Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-Based Approach. 2nd ed., Guilford Press, New York 2019.

Hogh E, Wolf P: Violent crime in a birth cohort: Copenhagen 1953–1977. In: Van Dusen KT, Mednick SA (eds.): Prospective Studies of Crime and Delinquency. Kluwer-Nijhoff Publishing, Boston 1983.

Jessor R, Turbin MS, Costa FM et al.: Adolescent problem behavior in China and the United States: a cross-national study of psychosocial protective factors. J Res Adolesc 2003; 13: 329–360.

Jolliffe D, Farrington DP: Individual differences and offending. In: McLaughlin E, Newburn T (ed.): The SAGE Handbook of Criminological Theory. SAGE Publications Inc., Thousand Oaks 2010: 40–55.

Lösel F, Farrington DP: Direct protective and buffering protective factors in the development of youth violence. Am J Prev Med 2012; 43 (2 Suppl 1): S8–S23.

Maguin E, Loeber R: Academic performance and delinquency. In: Tonry M (ed.): Crime and Justice. Vol. 20, University of Chicago Press, Chicago 1996: 145–264.

McGloin JM, Pratt TC: Cognitive ability and delinquent behavior among inner-city youth: a life-course analysis of main, mediating, and interaction effects. Int J Offender Ther Comp Criminol 2003; 47: 253–271.

Mears DP, Cochran JC: What is the effect of IQ on offending? Crim Justice Behav 2013; 40: 1280–1300.

Murray J, Shenderovich Y, Gardner F et al.: Risk factors for antisocial behavior in low- and middle-income countries: a systematic review of longitudinal studies. Crime Justice 2018; 47: 255–364.

Piquero AR, White NA: On the relationship between cognitive abilities and life-course-persistent offending among a sample of African Americans: a longitudinal test of Moffitt's hypothesis. J Crim Justice 2003; 31: 399–409.

Sánchez de Ribera O, Kavish N, Katz IM et al.: Untangling intelligence, psychopathy, antisocial personality disorder, and conduct problems: a meta–analytic review. Eur J Pers 2019; 33: 529–564.

Stattin H, Klackenberg-Larsson I: Early language and intelligence development and their relationship to future criminal behavior. J Abnorm Psychol 1993; 102: 369–378.

de Tribolet-Hardy F, Vohs K, Mokros A et al.: Psychopathy, intelligence, and impulsivity in German violent offenders. Int J Law Psychiatry 2014; 37: 238–244.

Ttofi MM, Farrington DP, Piquero AR et al.: Intelligence as a protective factor against offending: a meta-analytic review of prospective longitudinal studies. J Crim Justice 2016; 45: 4–18.

Turbin MS, Jessor R, Costa FM et al.: Protective and risk factors in health-enhancing behavior among adolescents in China and the United States: does social context matter? Health Psychol 2006; 25: 445–454.

de Vogel V, de Ruiter C, Bouman YHA et al.: SAPROF. Richtlijnen voor het beoordelen van beschermende factoren voor gewelddadig gedrag. Van der Hoeven Kliniek onderdeel van De Forensische Zorgspecialisten, Utrecht 2012.

de Vogel V, de Ruiter C, Bouman YHA et al.: SAPROF – wytyczne do oceny czynników ochronnych dotyczących ryzyka przemocy. Polish transl.: Nowopolski M, WelentoNowacka A, Ciszewski L et al. Van der Hoeven Kliniek, Utrecht 2016.

DOI: 10.15557/PiPK.2024.0025