

The relationship between bullying victimization, social support, physical activity and internalizing and externalizing problem behavior among adolescents in the Netherlands

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This thesis has been written as a study assignment under the supervision of a Utrecht University teacher. Ethical permission has been granted for this thesis project by the ethics board of the Faculty of Social and Behavioral Sciences, Utrecht University, and the thesis has been assessed by two university teachers. However, the thesis has not undergone a thorough peer-review process so conclusions and findings should be read as such.

Abstract

There is an increase in internalizing problem behavior (IPB) and externalizing problem behavior (EPB) in adolescents in the Netherlands. Little is known about which factors are more strongly related to IPB or EPB among adolescents in The Netherlands. Therefore, this cross-sectional study aims to clarify these relationships. It examines the relationship between bullying victimization, social support (consisting of family, school and peer support), physical activity and IPB, EPB or both. Data from 8927 primary and high school students (51.2% girls; M age = 14,13, SD = 1.91) who enrolled in the Dutch survey study HBSC (Health Behavior in School-aged Children) from 2017 was used. Through a multiple hierarchical regression it was found that bullying victimization is related to higher rates of IPB and EPB. Social support is related to lower rates of IPB. Family and school support are related to lower rates of EPB. In contrast, peer support relates to higher rates of EPB. Physical activity is related to lower rates of IPB, but not related to EPB. By gaining insight in the factors that are related to IPB and EPB, this study provides guidelines for policy and clarifies target groups for preventive programs. Moreover, it adds to the prevention of further deterioration of well-being among adolescents in the Netherlands.

Keywords: internalizing problem behavior, externalizing problem behavior, adolescents, bullying victimization, social support, physical activity, adolescent well-being

Abstract (Dutch)

Er is een toename van internaliserend probleemgedrag (IPB) en externaliserend probleemgedrag (EPB) bij adolescenten in Nederland. Er is weinig bekend over welke factoren sterker gerelateerd zijn aan IPB of EPB bij adolescenten in Nederland. Daarom heeft deze cross-sectionele studie tot doel deze relaties te verhelderen. Er wordt gekeken naar de relatie tussen gepest worden, sociale steun (bestaande uit steun van familie, school en vrienden), fysieke activiteit en IPB, EPB of beide. Data van 8927 basisschool- en middelbare scholieren (51.2% vrouw; M leeftijd = 14,13, SD = 1.91) die deelnamen aan het Nederlandse vragenlijstonderzoek genaamd 'HBSC' (Health Behavior in School-aged Children) uit 2017 werden gebruikt. Uit een meervoudige hiërarchische regressie werd gevonden dat gepest worden gerelateerd is aan hogere scores van IPB en EPB. Sociale steun is gerelateerd aan lagere scores van IPB. Steun van familie en school zijn gerelateerd aan lagere EPB-percentages. Daarentegen is steun van vrienden gerelateerd aan hogere EPB-percentages. Fysieke activiteit is gerelateerd aan lagere IPB-percentages, maar is niet gerelateerd aan EPB. Door inzicht te geven in de factoren die verband houden met IPB en EPB, biedt deze studie richtlijnen voor beleid en verduidelijkt het doelgroepen voor preventieve programma's. Daarmee draagt deze studie bij aan het voorkomen van verdere verslechtering van het welzijn van adolescenten in Nederland.

Kernwoorden: internaliserend probleemgedrag, externaliserend probleemgedrag, adolescenten, gepest worden, sociale steun, fysieke activiteit, welzijn van adolescenten

Table of contents

Abstract	2
Abstract (Dutch).....	3
Table of contents	4
Introduction	5
Methods	9
Results	15
Discussion	20
Appendix 1: HBSC 2017 questionnaire questions used in the current study.....	31

Introduction

Adolescents in the Netherlands show more problem behavior nowadays compared to the past (Boer et al., 2022; De Looze et al., 2014). The emotional wellbeing and life satisfaction of adolescents in The Netherlands have also been deteriorating (De Looze et al., 2020). Publication of these findings reestablished public attention to well-being of adolescents as a matter of concern.

The effects of problem behavior in adolescence can cause problems of well-being in adolescence and adulthood (Arseneault et al., 2009). Adolescence is a critical period of psychological change and development. It allows for transitions that are important to function as a productive adult (Viner et al., 2012). A healthy transition to adulthood therefore needs promotion of protective factors and avoidance of risk factors, like problem behavior (Catalano et al., 2002).

Problem behavior in adolescents emerges in internalizing and externalizing problem behavior (Bask, 2014). With Internalizing Problem Behavior (IPB), emotional responses are directed inward. It corresponds to issues such as depression, anxiety and psychosomatic problems. With Externalizing Problem Behavior (EPB), emotional responses are directed away from the self. EPB is characterized by, among others, aggression and rule-breaking behavior (Bask, 2014). In order to prevent and counteract problem behavior in adolescents, knowledge of the risk and the protective factors of problem behavior is required (Pisarska, 2018). Therefore, the aim of this study is to examine which factors are related to either IPB, EPB or both among adolescents in the Netherlands.

Previous research has shown that bullying victimization, social support and physical activity have significant influence on IPB and EPB of adolescents (Chu et al., 2010; Eastman et al., 2018; Pisarska et al., 2018). The relationship between these factors and IPB or EPB among adolescents have been studied in The Netherlands, although not much. However, these factors have never been studied in one research model. Moreover, there is no research on whether these factors are more strongly related to IPB or EPB among adolescents in The Netherlands. The current study will therefore contribute to the body of research on this topic in The Netherlands. By gaining insight in these relationships, this study wants to provide guidelines for policy and clarify target groups for preventive programs. Subsequently, this study adds to the prevention of further deterioration of well-being among adolescents and the effects this has on well-being in adulthood.

Bullying victimization

Experiences of being bullied (bullying victimization) have been associated with IPB and EPB (Eastman et al., 2018; Prino et al., 2019). Bullying involves a pattern of repeated aggression between peers, with deliberate intent to harm or disturb a victim despite apparent distress, and a (perceived) imbalance of power (Olweus, 1994).

Bullying victimization has devastating consequences on IPB (Arseneault et al., 2008; Nansel et al., 2001). Adolescents targeted by bullies not only show elevated levels of social isolation, depression and anxiety (Dawn Hamilton et al., 2008; Forero et al., 1999; Hawker & Boulton, 2000), but also increased self-harm and suicidal thoughts (Baldry & Winkel, 2003; Klomek et al., 2009; van der Wal et al., 2003). The impact of bullying victimization extends to EPB, as victims of bullying show violent behavior, substance use, poor academic performance and risk of bullying others (Arseneault et al., 2006, 2009; Barker et al., 2008; Nansel et al., 2004; Sullivan et al., 2006; Wigderson & Lynch, 2013).

Schoeler et al. (2018) explain that the adoption of IPB or EPB can act as an adaptation strategy to a hostile environment. Additionally, The social-cognitive theory suggests that being victimized undermines one's ability to develop and apply appropriate social skills (Hoglund & Leadbeater, 2007). This can create a vicious cycle of victimization, lack of supportive relationships and IPBs (Juvonen & Graham, 2014). Accordingly, bullying victimization is expected to be positively related to IPB and EPB.

Social support

Research shows that there is a positive relationship between social support and well-being of adolescents (Chu et al., 2010). Social support is defined as the provision of psychological and material resources with the intention of helping the recipients to cope with stress (Cohen, 2004). Cohen and Wills (1985) proposed that social support offers positive emotions, a sense of self-worth and functions as a stress buffer.

The ecological model states that adolescents' development is embedded in different layers of the environmental context (Bronfenbrenner & Morris, 2007). Most important for adolescents are the school, peer and family context (Cauce & Srebnik, 1990; Bronfenbrenner & Morris, 2007). Therefore, social support can be divided into family, school and peer support.

First, social support is considered a protective factor of IPB (Pisarska et al., 2018). Parental support is linked to lower rates of depression and higher levels of self-esteem (Barber, 2005; Viner et al., 2012). School support and peer support are associated with fewer

psychosomatic symptoms, improved self-esteem and less school-induced stress (Natvig et al., 1999; Sarkova et al., 2014; Wentzel, 1998). Consequently, a negative relationship between all three kinds of social support and IPB is expected.

Second, it is found that family and school support are protective factors of EPB (Viner et al., 2012). Adolescents who receive parental support are less likely to engage in sexual risk behaviors (Crosby et al., 2003), violence (Sethi et al., 2010) and other forms of misbehavior (Bru et al., 2001). Parental support promotes prosocial behavior (Barber et al., 2005). School support is linked to lower rates of EPB and better academic achievement (Bru et al., 2001; Sethi et al., 2010). However, it was found that peer support can cause conflict and competition (Berndt, 1989), drug abuse and delinquency (Borum, 2000). Hence, peer support can be considered a risk factor of EPB. Consequently, a negative effect of family and school support and a positive effect of peer support on EPB is expected.

Chu et al. (2010) also found that the effect of social support is stronger on internalizing than on externalizing behavior. Therefore, the effect of social support is expected to be stronger on IPB than on EPB.

Physical activity

Physical activity is also considered as a protective factor of IPB and EPB among adolescents (Ahn & Fedewa, 2011; Pisarska et al., 2018). First, physiological effects of physical activity, such as increased endorphin levels, lead to reduced levels of stress, anxiety and depression (Boone & Leadbeater, 2006; Motl et al., 2004; Penedo & Dahn, 2005; Petruzzello et al., 1991). Second, physical activity creates the ability to form social supportive bonds (Holt et al., 2016). Third, physical activities offer a context in which adolescents can improve social skills (Holt et al., 2016). Lastly, the experience of success associated with physical activity has a positive effect on self-perception and self-esteem (Bowker, 2006).

Physical activity is associated with lower rates of EPB such as better academic performance (Singh et al., 2012) and improvement of social skills (Holt et al., 2016). However, it is found that sports like wrestling and a negative coach-athlete relationship can lead to more EPB (Kreager, 2007; Rutten et al., 2006). These findings suggest that certain types and characteristics of physical activity can be a risk factor of EPB.

Still, Physical activity is expected to be a protective factor for IPB and EPB. In addition, the effect of physical activity is expected to be stronger on IPB than EPB.

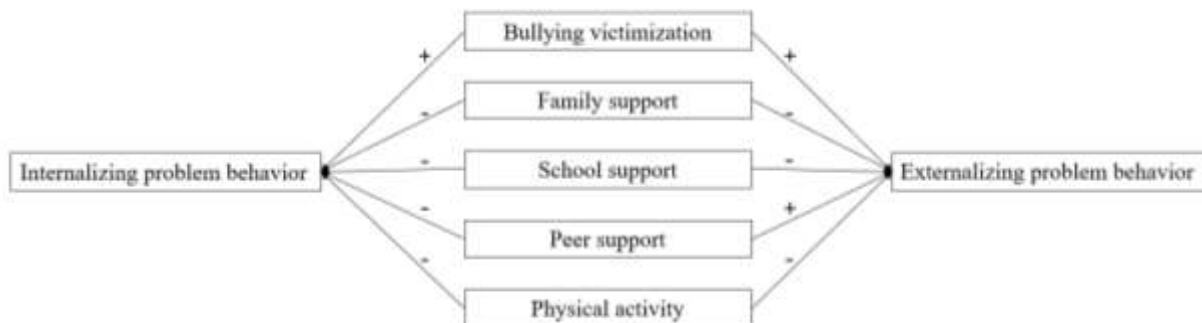
Current study

The current study examines the relationship of bullying victimization, social support consisting of family, school and peer support and physical activity on IPB and EPB among adolescents. The conceptual model is displayed in figure 1. This specific model has never been studied before in The Netherlands. Therefore, this research will enhance the current understanding of factors that impact IPB and EPB during adolescence.

The factors age, sex and family affluence have been associated with IPB and EPB (De Looze, 2020). By taking these into account as control variables, the influence of these factors is limited. The expectations of the current study are as follows: Bullying victimization is positively related to IPB (H1a) and EPB (H1b). Family (H2a), school (H2b) and peer support (H2c) are negatively related to IPB. Family (H3a) and peer support (H3b) are negatively related to EPB, while peer support is positively related to EPB (H3c). Plus, the effect of social support is stronger on IPB than EPB (H4). Next, physical activity is negatively related to IPB (H5a) and EPB (H5b). Lastly, the effect of physical activity is stronger on IPB than EBP.

Figure 1

Conceptual Model Current Study



Methods

Sample

The current study used data from the Dutch Health Behavior in School-aged Children (HBSC) study from 2017. It examines the health behavior of school-aged children. The study included data from adolescents aged 11-20 years attending primary or secondary education.

The sampling included a cross-sectional design and samples were obtained using a two-stage random sampling procedure. First, a random sample of schools was selected based on a national file of regular primary and secondary schools provided by the ministry of Education, Culture and Science. Students with psychiatric problems or learning disorders take part in special education and are therefore excluded from the sample. A sample of 72 primary schools and 85 high schools was established.

Second, classes within schools were randomly selected. For primary schools, only senior year students participated. 65 cases were deleted due to too much missing data, extreme values and/or an unreliable impression of the whole case. This resulted in the original sample of 8980 adolescents, of which 1588 (17,7%) primary school and 7392 (82,3%) secondary school students.

Compared to the Dutch population, HBSC's high school sample differed slightly on urbanity, gender, school year and type of school. Subsequently, the Dutch HBSC (2017) introduced a weight factor based on CBS data to assure national representativeness.

In the current study, participants who failed to fill in at least 4 questions on both the IPB and EPB scale were deleted from the sample, which resulted in the final sample of 8927 participants. The mean age of this sample was 14,13 years. More detailed demographics are shown in table 1.

Table 1*Socio demographics of the current sample*

Variables	Frequencies	Percentage
Sex		
Male	4357	48.8
Female	4570	51.2
Age		
10	115	1.3
11	1295	14.5
12	1541	17.3
13	1498	16.8
14	1424	16.0
15	1345	15.1
16	1037	11.6
17	518	5.8
18	133	1.5
19	18	0.2
20	3	0.0
Educational level		
Senior year primary school	1572	17.6
VMBO-b/k	1121	12.6
VMBO-g/t	2024	22.7
HAVO	1922	21.5
VWO	2288	25.6
Secondary school grade		
1	1610	18.0
2	1554	17.4
3	1487	16.7
4	1572	17.6
5	819	9.2
6	313	3.5

Note. The data are weighted by the weighting factor of the HBSC (2017). In case of classes with combined grades, adolescents were assigned to the category of the lower grade.

Procedures

Data collection involved the use of questionnaires consisting of mandatory questions determined internationally, along with additional questions added by the Dutch HBSC team. The HBSC study was ethically approved by the Ethische Toetsingscommissie (Ethical review committee) of the Faculty of Social Sciences at Utrecht University (Stevens et al., 2018). In primary schools, respondents filled in the questionnaires on paper. In high schools, digital questionnaires were used.

Prior to visiting the school, students received a letter addressed to their parents with information about the purpose of the study. Parents were informed of ways to object against the participation of their child. Students were also asked for their permission prior to participation in the study.

Respondents were assured of the confidentiality and anonymity of their responses. Research assistants mentioned to students that their responses would not be shared with third parties. All paper questionnaires were collected in one envelope. There was no record of information or login codes of the students who filled in the questionnaires online.

Measures

An overview of HBSC 2017 measures used in this study is included in Appendix 1.

Dependent variables

Internalizing problem behavior. The Emotional Symptoms subscale (including 5 items) of the Strengths and Difficulties Questionnaire (SDQ) was used to assess internalizing problem behavior (Goodman et al., 1998). The items consisted of a statement (e.g. I worry a lot). Participants chose from three answers on a Likert scale: (1) ‘not true’, (2) ‘somewhat true’ or (3) ‘definitely true’. Higher scores indicated more emotional symptoms. This subscale had good reliability (Cronbach’s Alpha = 0.70).

Externalizing problem behavior. The Behavioral Symptoms subscale (including 5 items) of the Strengths and Difficulties Questionnaire (SDQ) was used to assess externalizing problem behavior (Goodman et al., 1998). The items consisted of a statement (e.g. I often fight). Participants chose from three answers on a Likert scale: (1) ‘not true’, (2) ‘somewhat true’ or (3) ‘definitely true’. The item ‘I usually do as I am told’ was reverse coded. Higher scores

indicated more behavioral symptoms. This subscale had weak reliability (Cronbach's Alpha = 0.44).

Explanatory variables

Bullying victimization. An adapted version of the Olweus bullying victimization questionnaire was used (De Looze et al, 2020). Bullying victimization was measured with 2 items. Participants were asked to indicate if they have been bullied at school or online in the past couple of months with the following response options: (1) 'I haven't been bullied', (2) 'it happened 1-2 times', (3) '2-3 times a month', 4 'about once a week', (5) 'several times a week'. Higher scores indicated more victimization of bullying. This scale had weak reliability (Cronbach's Apha = .47).

Social support. Family support was measured with 4 items (e.g. I get the emotional support and help I need at home) based on a 7 point Likert scale with response options ranging from (1) 'strongly agree' to (7) 'strongly disagree'. The reliability of this scale is considered as good (Cronbach's Alpha = .91).

Peer support was measured with 4 items (e.g. I can talk about my problems with my friends) based on a 7 point Likert scale with response options ranging from (1) 'strongly agree' to (7) 'strongly disagree'. The reliability of this scale is considered as good (Cronbach's Alpha = .93).

School support was measured with 6 items (e.g. Other classmates accept me as I am) based on a 5 point Likert scale. The response options consisted of, in order, 'totally agree', 'agree', 'don't agree/don't disagree', 'disagree' and 'totally disagree'. The reliability of this scale is considered as good (Cronbach's Alpha = .83). Higher scores on each of these scales indicated more received support.

Physical activity. Measured with 3 items. The first item 'On how many of the last 7 days did you exercise for a total of at least 60 minutes a day?' included 8 answer categories ranging from '0 days' to '7 days' (Prochaska et al., 2001).

The second item 'Outside school hours: approximately how often do you play (a sport) in your free time, so that you get out of breath or start sweating?' included the following 7 answer categories: 'every day', '4 to 6 times a week', '2 to 3 times a week', 'once a week', 'once a month', 'less than once a month' and 'never' (Van Dorsselaer et al., 2007).

The third item ‘Outside school hours: approximately how many hours a week do you play (a sport) in your free time, so that you get out of breath or start sweating?’ included the following 6 answer categories: ‘none’, ‘around half an hour’, ‘around 1 hour’, ‘around 2 to 3 hours’, ‘around 4-6 hours’, ‘7 hours or more’.

To combine these three items into one scale, the second item was reversed coded and z-scores were created of all items. Higher scores indicated more participation in physical activity. Taken together, the reliability of this scale is considered as good (Cronbach’s Alpha = .77).

Control variables

Sex. Participants indicated whether they are a boy or a girl. Boys were set as the reference group.

Age. Participants identified the year and month of their birth.

Family affluence. The Family Affluence Scale (FAS III), consisting of 6 items related to the material conditions in the participants' household (e.g. ownership of a car or computer), assessed family affluence. Individual responses were summed to provide summary scores ranging from 0 to 13 with higher values indicating higher levels of family affluence. The reliability of this scale is considered as weak (Cronbach’s Alpha = .51).

Data analysis

All analyses were performed using statistics software package SPSS v28. To address the research question two multiple hierarchical linear regressions were conducted. The regressions included two models: 1) including the dependent variables and control variables and 2) adding the explanatory variables. The assumptions of a multiple hierarchical linear regression are described.

First, the data of dependent variables should be normally distributed. This is not the case in the current sample (Skewness IPB = .98 and EPB = 1.16). However, according to Field’s central limit theory, because the sample size is big ($N = 8729$), non-normal distributed data is not a problem. Therefore, this assumption is met. Second, the assumption of additivity and linearity. Per dependent variable, a p-p plot was created for the dependent variable versus the independent variables. As the points on the plot are closely distributed along the diagonal line with a roughly constant variance, this assumption is met. Third, the assumption of

independent errors. Residuals should be statistically independent. This assumption is met because every adolescent filled in their questionnaire individually. Fourth, the assumption of homoscedasticity. Per dependent variable, a scatterplot was created for the dependent variable versus the independent variables. Points on the plot show equal distribution across all values of the independent variables. Hence, this assumption is met.

Fifth, errors should be normally distributed. This assumption is met. Sixth, predictors should be uncorrelated with external variables. Control variables are included to check for at least a couple of external variables, therefore this assumption is met. Seventh, all explanatory variables must be quantitative or categorical (with two categories). The outcome variable must be quantitative (interval level), continuous and unbounded. This assumption is met. Eighth, the assumption of multicollinearity. VIF scores of explanatory variables are all below 4. Therefore, this assumption is met. Lastly, the assumption of non-zero variance. This assumption is met.

Results

Table 2 shows the descriptives of the dependent variables, explanatory variables and family affluence.

Table 2

Descriptives of the dependent and explanatory variables and family affluence.

	<i>Mean</i>	<i>Std. Deviation</i>	<i>Min.</i>	<i>Max.</i>
IPB	1.50	.45	1.00	3.00
EPB	1.37	.30	1.00	3.00
Family affluence	8.98	1.86	.00	13.00
Bullying victimization	1.14	.44	1.00	5.00
Family support	6.07	1.30	1.00	7.00
Peer support	5.78	1.33	1.00	7.00
School support	3.92	.66	1.00	5.00
Physical activity	-.01	.83	-2.56	1.34

Note. Rounded on two decimals. The physical activity scale is based on z-scores.

Effects on internalizing problem behavior

The results of the first multiple hierarchical linear regression are displayed in table 3 and figure 2. It was used to examine the effects of bullying victimization (H1a), social support (H2a, H2b and H2c) and physical activity (H5a) on IPB. The data were controlled for sex, age and family affluence. The first model accounted for a significant amount of variance, $F(3, 8630) = 368.60, p < .001$. The second model showed a significant F change = $<.001$ compared to the first model, with $\Delta R^2 = .113$. As shown in table 3, each of the explanatory variables were a significant predictor of IPB, independent of one another, as $p < .001$. Bullying victimization is positively related with IPB ($\beta = .174, p < .001$), hence hypothesis 1a is confirmed. Family support is significantly negatively related to IPB ($\beta = -.142, p < .001$), as well as peer support ($\beta = -.058, p < .001$) and school support ($\beta = -.131, p < .001$). Therefore hypotheses 2a, 2b and 2c are confirmed. Lastly, physical activity is significantly negatively related to IPB ($\beta = -.068, p < .001$). Therefore, hypothesis 5a is also confirmed.

Table 3

A multiple hierarchical linear regression on the effects of control variables family affluence, age and sex and explanatory variables bullying victimization, social support and physical activity on IPB.

	<i>b</i>	SE B	β	<i>p</i>	95% CI for <i>b</i>	
					Lower Bound	Upper Bound
Model 1						
Constant	.887	.044		<.001	.801	.973
Sex	.275	.009	.304	<.001	.257	.293
Age	.026	.002	.110	<.001	.021	.031
Family affluence	-.020	.002	-.081	<.001	-.023	-.015
Model 2						
Constant	1.50	.059		<.001	1.385	1.617
	1					
Sex	.277	.009	.306	<.001	.259	.294
Age	.015	.002	.062	<.001	.010	.019
Family affluence	-.008	.002	-.033	<.001	-.013	-.003
Bullying victimization	.180	.010	.174	<.001	.160	.200
Family support	-.049	.004	-.142	<.001	-.057	-.042
Peer support	-.020	.004	-.058	<.001	-.027	-.012
School support	-.090	.007	-.131	<.001	-.103	-.076
Physical activity	-.037	.005	-.068	<.001	-.048	-.026

Note. $R^2 = .114$ for model 1; $\Delta R^2 = .113$ for model 2 ($p = <.001$)

Effects on externalizing problem behavior

The results of the second multiple hierarchical linear regression are displayed in table 4 and figure 2. It was used to examine the effects of bullying victimization (H1b), social support (H3a, H3b and H3c) and physical activity (H5b) on EPB. The data were again controlled for sex, age and family affluence. The first model accounted for a significant amount of variance, $F(3, 8630) = 38.023, p < .001$. The second model showed a significant F change = $<.001$ compared to the first model, with $\Delta R^2 = .119$. As shown in table 1, all explanatory variables except for physical activity ($p = .542$) were significant predictors of EPB, independent of another, as $p < .05$. Bullying victimization is positively related with EPB ($\beta = .152, p < .001$), therefore hypothesis 1b is confirmed. Family support is significantly negatively correlated with IPB ($\beta = -.225, p < .001$), as well as school support ($\beta = -.156, p < .001$). However, the relation between peer support ($\beta = .030, p = .009$) and EPB is significant, but positive. Hence hypothesis 3a, 3b and 3c are all confirmed. This implies a difference between a significant positive and negative relationship within the construct of social support. Lastly, physical activity is not significantly related to EPB ($\beta = -.006, p = <.542$). Therefore, hypothesis 5b is not confirmed. This is unexpected and suggests a difference between the relationship of physical activity on IPB and EPB.

Table 4

A multiple hierarchical linear regression on the effects of control variables family affluence, age and sex and explanatory variables bullying victimization, social support and physical activity on EPB.

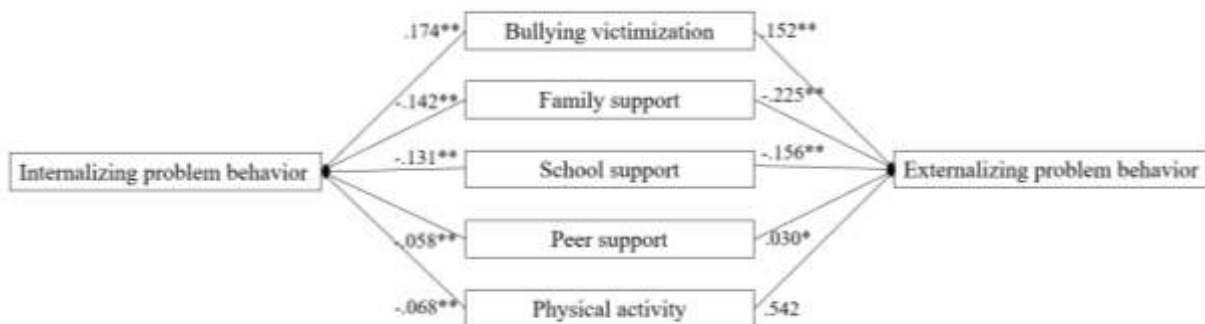
	<i>b</i>	SE B	β	<i>p</i>	95% CI for <i>b</i>	
					Lower Bound	Upper Bound
Model 1						
Constant	1.608	.031		.000	1.548	1.668
Sex	-.060	.006	-.101	<.001	-.073	-.048
Age	-.006	.002	-.037	<.001	-.009	-.002
Family affluence	.002	.002	-.047	<.001	-.011	-.004
Model 2						
Constant	2.123	.041		<.001	2.042	2.204
Sex	-.065	.006	-.110	<.001	-.078	-.053

Age	-.015	.002	-.093	<.001	-.018	-.011
Family affluence	-.002	.002	-.013	.203	-.005	.001
Bullying victimization	.104	.007	.152	<.001	.090	.118
Family support	-.052	.003	-.225	<.001	-.057	-.047
Peer support	.007	.003	.030	.009	.002	.012
School support	-.070	.005	-.156	<.001	-.080	-.061
Physical activity	-.002	.004	-.006	.542	-.010	.005

Note. $R^2 = .013$ for model 1; $\Delta R^2 = .119$ for model 2 ($p = <.001$)

Figure 2

The β values of the two multiple hierarchical regressions displayed in the conceptual model.



Note. * $p < .05$ ** $p < .001$.

Comparing IPB and EPB

Two multiple hierarchical linear regressions were performed. With these tests, it was not possible to compare the effects of social support and physical activity on both dependent variables. In table 5 the standardized coefficients of the explanatory and control variables are set out against IPB and EPB. Significance of relations cannot be assessed, but the size of the standardized coefficients can still be compared. The Standardized coefficient for both family

and school support was bigger for EPB than IPB. Only the standardized coefficient of peer support is bigger for IPB than EPB. As it was expected that the relationship of all three forms of social support would be stronger for IPB and EPB, this result only supported hypothesis 4 in case of peer support. The standardized coefficient of physical activity is bigger for IPB than EPB. Moreover, the relationship between physical activity and EPB is not significant. Thus, these results support hypothesis 6.

Table 5

Standardized coefficients (β) and p value of the explanatory variables set out against IPB and EPB.

	IPB		EPB	
	β	P	β	p
Family affluence	-.033	<.001	-.013	.203
Bullying victimization	.174	<.001	.152	<.001
Family support	-.142	<.001	-.225	<.001
Peer support	-.058	<.001	.030	.009
School support	-.131	<.001	-.156	<.001
Physical activity	-.068	<.001	-.006	.542

Note. Data derived from model 2 of the multiple hierarchical linear regressions of both IPB and EPB.

Discussion

Reports on increasing internalizing problem behavior (IPB) and externalizing problem behavior (EPB) among adolescents in The Netherlands have raised concerns about adolescents' well-being (Boer et al., 2022; De Looze et al., 2014). Knowledge of risk and protective factors of problem behavior is necessary to prevent and counteract them (Pisarska, 2018). Therefore, the aim of this study was to examine which factors are related to either IPB, EPB or both among adolescents in the Netherlands. This study examined the relationship between bullying victimization, social support, physical activity and IPB as well as EPB. These factors have never been studied in one research model. Moreover, there is no research on whether these factors are more strongly related to IPB or EPB among adolescents in The Netherlands.

The results imply that bullying victimization is a risk factor of IPB and EPB. Next, Family, school and peer support are found to be protective factors of IPB. Family and school support are also protective factors of EPB. However, the results show that peer support is a risk factor of EPB. So, there is a difference within the social support construct and its relation with EPB. Lastly, physical activity was expected to be a protective factor of IPB and EPB. Against expectation, physical activity was only found to be a protective factor of IPB, not EPB.

In line with hypothesis 1 and previous research, the findings show that adolescents who are victims of bullying show more signs of IPB and EPB (Eastman et al., 2018). Schoeler et al. (2018) suggested that adoption of IPB and EPB can serve as an adaptive approach in dealing with a hostile environment. The social-cognitive theory proposes that experiencing victimization of bullying undermines the development and utilization of effective social skills (Hoglund & Leadbeater, 2007). This can initiate a harmful cycle of victimization and engagement in IPB (Juvonen & Graham, 2014).

Confirming hypothesis 2, the results show that adolescents with higher levels of family, school or peer support show less signs of IPB. Social support is often associated with fewer depressive symptoms and less school-induced stress (Barber, 2005; Sarkova et al., 2014; Viner et al., 2012). It is also often seen as a buffer for many risk factors of well-being, like IPB (Heberle et al., 2015). Hence, future research should examine the potentially moderating role of social support in the relationship between IPB and adolescents' well-being in The Netherlands.

Consistent with previous research and hypothesis 3, current findings show that adolescents who receive more family and school support show less signs of EPB. In contrast, adolescents who receive more peer support show more signs of EPB (Barber et al., 2005; Bru et al., 2001; Crosby et al., 2003; Sethi et al., 2010). This shows a discrepancy within the construct of social support and its relation with EPB. Bru et al., (2001) explain that peer support is the only source of support that people choose themselves. Children with similar characteristics and behavior tend to choose each other, and are more likely to encourage each other on the qualities they share (Erdley et al., 2001). Adolescents can therefore be encouraged by peers to demonstrate EPB. However, Barrera et al. (1993) suggest that the negative outcomes may not neutralize the positive outcomes of peer support. Because, as found, peer support can be considered a protective factor of IPB. It is for example associated with improved self-esteem (Sarkova et al., 2014). To examine when peer support has a positive or negative influence on the well-being of adolescents, future research should discover and define the relationship between peer support, IPB and EPB.

In line with hypothesis 5, the results suggest that adolescents who take part in more physical activity show less signs of IPB. This can possibly be explained by the physiological effects of physical activity, as for example elevated endorphin levels reduce signs of stress and depressive symptoms (Boone & Leadbeater, 2006). However, against expectation, adolescents who take part in physical activity do not experience more or less signs of EPB. Sex could play an important role. Kreager (2007) suggests that athletic involvement fails to inhibit male violence. Even males whose friends play football were more likely to fight than other males (Kreager, 2007). This supports the perspective of peer support as important moderator in the relationship between physical activity and EPB. It corresponds to the current finding that higher scores on peer support are related to higher scores on EPB. Further research on this relationship is needed.

Other contextual factors, like a negative coach-athlete relationship, were also found to be related to more signs of EPB (Rutten et al., 2006). Still, physical activity is also associated with lower rates of EPB (Holt et al., 2016; Singh et al., 2012). Lots of different factors seem to influence the relationship between physical activity and EPB. Therefore, future research is needed to investigate parameters that influence the relationship between physical activity and EPB, like sex differences, different types of sports and the coach-athlete relationship.

Hypothesis 4 and 6 expected the effect of social support and physical activity to be stronger on IPB than EPB. Previous research found the relationship of social support to be stronger on IPB than EPB (Chu et al., 2010). The current study could not calculate a

significant effect, but did find the standardized coefficient for family and school support to be bigger for EPB than IPB. Only the standardized coefficient of peer support was bigger for IPB than EPB. So, hypothesis 4 is only supported in case of peer support.

Peer support is found to be a protective factor of IPB, but a risk factor of EPB. So, if peer support is indeed more strongly correlated with IPB than EPB, this might indicate that the pros of peer support outweigh the cons of peer support, as was discussed before. Future research should investigate this by comparing the effect of social support, and especially peer support, on IPB and EPB.

As the results show a significant relationship between physical activity and IPB, but not between physical activity and EPB, hypothesis 6 is supported. To statistically confirm or reject this hypothesis, future research is needed to compare the effect of physical activity on IPB with that on EPB.

Limitations and strengths

This study has a number of strengths, such as the use of a nationally representative and large dataset. Thus, this study is highly generalizable to the Dutch population. This study also has high reliability on the social support and physical activity scales. Additionally, sophisticated analyses were performed using SPSS. The current study brought together a wide range of parameters of importance to the well-being of adolescents. This contributes to the identification of complex relationships and improved external validity.

Yet, the current study is limited by its use of cross-sectional surveys, which excludes inference of causality. While relations like that of bullying victimization are significantly related to IPB, this is not sufficient to conclude that being a victim of bullying *causes* more signs of IPB. Future longitudinal research should examine whether bullying victimization, social support and physical activity cause more or less signs of IPB and EPB over time.

A second limitation relates to the lack of IPB and EPB measures included in the HBSC study. The two scales both consisted of only 5 items, and did not account for depressive symptoms and anxiety (De Looze et al., 2020). The Youth Self-Report (YSR) form of the Achenbach System of Empirically Based Assessment (ASEBA; Achenbach & Rescorla, 2001) is an example of a more comprehensive scale that might be used in the future to study this topic (Stewart & Suldo, 2011).

Third, data collected in the HBSC study relies on self-reporting by the participants which can be susceptible to biases such as social desirability bias or inaccurate recall. Fourth, a huge spectrum of factors are thought to be related to IPB and EPB, like academic

competence (Moilanen et al., 2010). The current study did not consider or control for all of these factors. Future research is needed to distinguish the weight of factors that are related to IPB and EPB.

Conclusion and implications

The results of the current study contribute to the body of research on the topic of IPB and EPB among adolescents in The Netherlands. By gaining insight in the factors that are related to IPB and EPB, this study provides guidelines for policy and clarifies target groups for preventive programs. Physical activity showed to be a protective factor of IPB, but not of EPB. Therefore, physical activity could be used as a tool in policy programs countering signs of IPB among adolescents. Current findings also help clarify target groups for preventive programs. A significant negative relationship was found between bullying victimization and IPB. So, one could target people who are being bullied in an IPB prevention program. This knowledge can also be used to highlight the importance of anti-bully campaigns. Stop Pesten NU (Stop Bullying NOW) did this, by mentioning that bullying is related to IPB, like depression (*19 April 2023 Landelijke Dag Tegen Pesten Voor Eenheid & Verbinding, 2023*). Subsequently, as IPB and EPB influence the well-being of adolescents, this study adds to the prevention of further deterioration of well-being among adolescents.

More research is needed to further deepen the understanding of factors that influence IPB and EPB. Let these findings be an encouragement to gain additional knowledge that can be used to prevent or counteract the increasing rates of IPB and EPB among adolescents in The Netherlands.

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Appendix 1: HBSC 2017 questionnaire questions used in the current study

1. Wanneer ben je geboren?

JAAR

- | | | |
|-------------------------------|-------------------------------|---|
| <input type="checkbox"/> 2007 | <input type="checkbox"/> 2003 | <input type="checkbox"/> 1999 |
| <input type="checkbox"/> 2006 | <input type="checkbox"/> 2002 | <input type="checkbox"/> 1998 |
| <input type="checkbox"/> 2005 | <input type="checkbox"/> 2001 | <input type="checkbox"/> 1997 |
| <input type="checkbox"/> 2004 | <input type="checkbox"/> 2000 | <input type="checkbox"/> Anders, namelijk <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> |

MAAND

- | | | |
|-----------------------------------|-----------------------------------|------------------------------------|
| <input type="checkbox"/> Januari | <input type="checkbox"/> Mei | <input type="checkbox"/> September |
| <input type="checkbox"/> Februari | <input type="checkbox"/> Juni | <input type="checkbox"/> Oktober |
| <input type="checkbox"/> Maart | <input type="checkbox"/> Juli | <input type="checkbox"/> November |
| <input type="checkbox"/> April | <input type="checkbox"/> Augustus | <input type="checkbox"/> December |

2. Ben je een jongen of een meisje?

- Jongen
 Meisje

15. Op hoeveel dagen van de LAATSTE 7 DAGEN was je in totaal ten minste 60 MINUTEN per dag bezig met lichaamsbeweging?

Tel alle tijd die je per dag met lichaamsbeweging doorbrengt bij elkaar op.

- | | | | | | | | |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| 0 dagen | 1 dag | 2 dagen | 3 dagen | 4 dagen | 5 dagen | 6 dagen | 7 dagen |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

16. BUITEN SCHOOLTIJD: Hoe VAAK doe je ongeveer aan een sport of speel je in je vrije tijd, zodat je buiten adem raakt of gaat zweten?

- Iedere dag
 4 tot 6 keer per week
 2 of 3 keer per week
 Eén keer per week
 Eén keer per maand
 Minder dan één keer per maand
 Nooit

17. BUITEN SCHOOLTIJD: Hoeveel UUR PER WEEK doe je ongeveer aan een sport of speel je in je vrije tijd, zodat je buiten adem raakt of gaat zweten?

- Niet
 Ongeveer een half uur
 Ongeveer 1 uur
 Ongeveer 2 tot 3 uur
 Ongeveer 4 tot 6 uur
 7 uur of meer

38. Hieronder staan uitspraken over jouw gezin (het gezin waar je het meeste bent). We willen graag weten hoe je hierover denkt.

Lees elke zin goed door en kruis op iedere regel één vakje aan.

	1. Heel erg niet mee eens	2	3	4	5	6	7. Heel erg mee eens
De mensen in mijn gezin doen echt hun best om mij te helpen	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ik krijg thuis de emotionele steun en hulp die ik nodig heb	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ik kan thuis over mijn problemen praten	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bij ons thuis willen ze me helpen om beslissingen te nemen	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

43. Hieronder staan uitspraken over je vrienden of vriendinnen. We willen graag weten hoe je hierover denkt. Kruis op iedere regel één vakje aan.

	1. Heel erg niet mee eens	2	3	4	5	6	7. Heel erg mee eens
Mijn vrienden proberen mij echt te helpen	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ik kan op mijn vrienden rekenen als er iets fout gaat	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ik heb vrienden met wie ik lief en leed kan delen	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ik kan met mijn vrienden over mijn problemen praten	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

deze uitspraken vindt (of je het er wel of niet mee eens bent). Kruis op iedere regel één vakje aan.

	Helemaal mee eens	Mee eens	Niet eens/niet oneens	Niet mee eens	Helemaal niet mee eens
Mijn klasgenoten vinden het fijn bij elkaar te zijn	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
De meeste klasgenoten zijn vriendelijk en hulpvaardig	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Andere klasgenoten accepteren me zoals ik ben	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ik heb het gevoel dat mijn leraren mij accepteren zoals ik ben	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ik heb het gevoel dat mijn leraren om mij geven	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ik heb veel vertrouwen in mijn leraren	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

56. Jouw gedrag en gevoelens

De volgende vragen gaan over jouw gedrag in de LAATSTE ZES MAANDEN. Geef met een kruisje aan of de uitspraken voor jou 'niet waar zijn' of 'een beetje waar zijn' of 'zeker waar zijn'.

Kruis op iedere regel één vakje aan.

Niet waar	Beetje waar	Zeker waar	De vragen gaan over de LAATSTE ZES MAANDEN.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Ik ben rusteloos, ik kan niet lang stilzitten
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Ik heb vaak hoofdpijn, buikpijn, of ben misselijk
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Ik word erg boos en ben vaak driftig
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Ik ben nogal op mijzelf. Ik speel meestal alleen of bemoei mij niet met anderen
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Ik doe meestal wat me wordt opgedragen
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Ik pieker veel
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Ik zit constant te wiebelen of te friemelen
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Ik heb minstens één goede vriend of vriendin
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Ik vecht vaak. Het lukt mij andere mensen te laten doen wat ik wil
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Ik ben vaak ongelukkig, in de put of in tranen
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Andere jongeren van mijn leeftijd vinden mij over het algemeen aardig
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Ik ben snel afgeleid, ik vind het moeilijk mij te concentreren
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Ik ben zenuwachtig in nieuwe situaties. Ik verlies makkelijk mijn zelfvertrouwen
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Ik word er vaak van beschuldigd dat ik lieg of bedrieg
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Andere kinderen of jongeren pesten of treiteren mij
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Ik denk na voor ik iets doe
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Ik pak dingen weg die niet van mij zijn, thuis, op school of op andere plaatsen
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Ik kan beter met volwassenen opschieten dan met jongeren van mijn leeftijd
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Ik ben voor heel veel dingen bang, ik ben snel angstig
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Ik maak af waar ik mee bezig ben. Ik kan mijn aandacht er goed bij houden

60. Hoe vaak ben jij in de LAATSTE PAAR MAANDEN op school gepest?

- Ik ben in de laatste paar maanden nooit gepest op school.
- Het is één of twee keer gebeurd
- 2 of 3 keer per maand
- Ongeveer een keer per week
- Een paar keer per week

62. Hoe vaak ben jij IN DE LAATSTE PAAR MAANDEN gepest *via internet* (cyberpesten) ?
Bijvoorbeeld: iemand stuurde gemene tekstberichtjes, chat-berichtjes of andere teksten, plaatste berichten op jouw profiel, of maakte een website of pagina waarop jij voor gek gezet werd. Of iemand plaatste zonder jouw toestemming foto's op internet of deelde ze met anderen waar je stom of lelijk op stond.

- Ik ben in de laatste paar maanden nooit *via internet* gepest
- Het is één of twee keer gebeurd
- 2 of 3 keer per maand
- Ongeveer een keer per week
- Een paar keer per week