Risk factors of Internet Addiction and the health effect of Internet Addiction on adolescents: A systematic review of longitudinal and prospective studies

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ABSTRACT
Internet gaming addiction was included the latest version of the DSM-V as a possible disorder recently, while debate is still on-going as to whether the condition called "Internet Addiction" (IA) could be fully recognised as an established disorder. The major contention is how well IA could fulfil the validation criteria as a psychiatric disorder as in other well-established behavioural addictions. In addition to various proposed validation criteria, evidence of risk and protective factors as well as development of outcomes from longitudinal and prospective studies are suggested as important. A systematic review of available longitudinal and prospective studies was conducted to gather epidemiological evidence on risk and protective factors of IA and the health effect of IA on adolescents. Nine articles were identified after an extensive search of the literature in accordance to the PRISMA guidelines. Of these, 8 provided data on risk or protective factors of IA and one focused solely on the effects of IA on mental health. Information was extracted and analysed systematically from each study and tabulated. Many exposure variables were studied and could be broadly classified into three main categories: psychopathologies of the participants, family and parenting factors, and others such as Internet usage, motivation, and academic performance. Some were found to be potential risk or protective factors of IA. It was also found that exposure to IA had a detrimental effect on the mental health of young people. These results were discussed in light of the their implications to the fulfilment of the validation criteria.

Keywords: Internet Addiction; Risk Factor; Protective Factor; Health Effect; Adolescents; Systematic Review

INTRODUCTION

It has long been noticed that excessive use of information and communication technologies could become problematic behaviour that requires more attention.[1] In the past decade or more, different terms have been used to describe such behaviour including: "compulsive computer use"; "Internet dependency"; "pathological Internet use"; and "Internet addiction".[2-5] Some other terms have also been used to describe specific Internet use behaviours, such as: "Internet Gaming Disorder", "Internet Gaming Addiction", "Cybersex Addiction".[6-9] While the debate is still on-going as whether the condition called "Internet Addiction" (IA) could be fully recognised as an established disorder, Internet Gaming Addiction (IGA) has been included in Section III of the latest version of the Diagnostic and Statistical Manual of Mental Disorder V (DSM-V) as an emerging disorder that requires further investigation.[10] While acknowledging that there may be many different facets of the phenomenon of human behaviours related to excessive and unhealthy use of the Internet, for ease of communication the term IA will be used loosely, covering the broad range of the aforementioned behaviours.

As there are many aspects of the phenomenon, there are also different thoughts on the definition of IA and as a result, different models of assessment based on various conceptualisation of the phenomenon.[11-12] Lui and Potenza provided a historical perspective of the early development in the conceptualisation of IA from the late 90s to the early 2000s.[11] They analysed the diagnostic criteria of IA proposed by Young which was based on the DSM-IV criteria for pathological gambling characterised by three main features: preoccupation, loss of control, and harmful effect.[5] Lui and Potenza further noted that Shapira et al. [13] had used a broader concept for the definition of IA as a behaviour that is uncontrollable; markedly distressing, and resulting in difficulties in terms of social life, occupation, and finance.[11] This view was also advocated by Ha et al. when their research team defined IA as: "the inability of individuals to control their Internet use, resulting in marked distress and/or functional impairment in daily life".[14] Such a definition was also adopted by Pies in his analysis of the conceptualisation and the diagnosis of IA. [12]

Among all the debate on IA is the major contention of how well IA could fulfil the validation criteria as a psychiatric disorder, as in other well-established behavioural addiction.[15] Robins and Guze, who first proposed a set of formal criteria for establishing the validity of psychiatric diagnoses, suggested five criteria.[16] These included: a clear clinical description of the disorder; evidence from laboratory studies; exclusion of other disorders; evidence from follow-up studies; and family studies.[16] Pies echoed this view by advocating his set of criteria that at least one of the three needed to be satisfied, namely a genetic linkage on a specific locus to the condition; a well-known aetiology or pathology; and the course, prognosis, stability, and response to treatment should be relatively consistent across different populations.[12] A similar set of criteria was also put forwarded by Gentile et al in which, first and foremost, information on the aetiological risk and protective factors of IA as well as the comorbidities of IA were important for the determination of its validity as a psychiatric disorder.[17] In attempting to gather evidence for the satisfaction of the aforementioned criteria, various studies were reported. For example, to examine the issue of comorbidities of IA, Ko et al. conducted a systematic review of the literature on the association between IA and psychiatric disorders.[18●] A number of disorders were identified as comorbidities of IA. These included: substance use, attention-deficit hyperactivity disorder, depression, and social anxiety disorder.[18●] However, in terms of aetiological risk and protective factors, as well as the course and prognosis of IA, information

could only be provided by well-designed epidemiological studies of a longitudinal or prospective nature, as highlighted as one of the criteria by Robins and Guze.[16]

The aim of this study is to examine the available information through a systematic review of longitudinal or prospective studies on possible risk and protective factors of IA, as well as the effect of IA on the health of adolescents. The reasons for choosing adolescents as the target population of this study are twofold: 1) it has been demonstrated that IA is more prevalent in adolescents than in other age groups; 2) there are far more studies available in this age group than in others.

METHODS

Search strategies

The PRISMA guidelines for systematic reviews and meta-analysis were employed for the conduct of the literature search following a systematic and structured approach.[19] Major medical, health, and psychological literature databases including PubMed, MEDLINE with Full Text, Cochrane Database for Systematic Review, and PsychINFO were used and the search included all publication years (till June 2014). The keywords used for the systematic search were: ("excessive Internet use" or "problematic Internet use" or "pathological Internet use" or "Internet addiction" or "excessive computer use" or "Internet gaming" or "computer gaming" or "Internet gaming addiction" of " Internet gaming disorder") AND ("longitudinal study" or " prospective study" or "cohort study" or "follow-up study"). Included in the search were articles published as reviews for the purpose of identifying relevant studies. However, these review articles were not included in this systematic review. Limitations were imposed on the search for publications in the English language only and the study subjects were adolescents loosely defined as young people aged between 13 to 18 years. Upon completion of the search on the electronic database, titles and abstracts of the identified articles were assessed for their suitability to the included in the review. Additional searches were also conducted on other "grey" literature database such as Google scholar. After assessing the titles and abstracts, full text of the articles deemed suitable were retrieved for further examination of the contents of the studies to determine their final inclusion in the review. Furthermore, the reference lists of the selected articles were also examined for additional suitable publications that might have been overlooked in the previous search.

Selection Criteria

The following selection criteria were applied for suitable articles: 1) epidemiological studies with appropriate study design that included a cohort of participants recruited with the exposure variable assessed at baseline and then followed for a period of time for outcome measures; 2) examined the relationship between some potential risk factors (exposure) of IA (outcome), or the effect of IA (exposure) on the health (outcome) of the participants; 3) the assessment of IA, as an exposure or an outcome variable, was conducted using a validated and standardised instrument based on a sound theoretical framework; 4) the assessment of risk factors and health was conducted using a validated and standardised instrument; 5) provided information on the risk estimate of the relationship. Conference proceedings, abstracts, and non-peer-reviewed journal articles were excluded from this review.

Information extraction and analysis

Information was extracted from the selected articles and tabulated for further analysis. Of interest was information on the relationship between potential risk or protective factors and IA. These might include personal, familial, parental, Internet usage, psychopathologies, and

personality factors. Additionally, the effect of IA on the health of young people was also relevant to the review. Information extracted from the selected studies included the location of the study, study design, study sample, assessment of the exposure and outcome variables, analytical approach, estimated effects, and other information or remarks relevant to the study. This information was then summarised and analysed by the risk and protective factors of IA and the effects of IA on health separately.

RESULTS

Following the aforementioned procedures, an extensive search was conducted resulting in 23 articles reporting on a longitudinal or prospective study in the English language on Internet use among adolescents.[14, 20-42] After examining the abstract of these reports, 14 were possible candidates for inclusion in the review. A closer examination of the full text of these articles revealed that only 9 satisfied the selection criteria and contained sufficient information. Of these 9 articles, 8 provided data on risk or protective factors of IA and one focused solely on the effects of IA on mental health. [24-26,28,30,35,38,39●,41] Among the articles reporting on risk or protective factors of IA, a cohort of Taiwanese adolescents had been used three times resulting in three articles on different risk factors.[25,35,41]These were included as three separate reports in the analysis. The main reason for the exclusion of other articles was that they focused on other Internet use but not IA. As a result, 8 reports on the risk or protective factors and IA and 1 on the effects of IA on mental health were included. Detailed information was extracted from these articles and summarised in Table 1 and 2.

The risk or protective factors of Internet Addition

In terms of the study design, nearly all but one utilised self-reported questionnaire surveys to collect baseline data and the cohort was resurveyed for the outcome measures with follow-up periods ranging from 6 to 36 months. The only exception was the report by Cho et al. in which parents had been recruited as informants to provide data on the psychopathology of their children at childhood with a follow-up period of 7 years.[39●] The majority of the reported studies utilised a large sample size of more than 1000 participants recruited from primary to junior high schools except three with a smaller sample size of about 500.[24,26,39●] For assessment of IA, the reported studies mainly used three validated instruments: The Compulsive Internet Use Scale designed by Van Rooij et al., Young's Internet Addiction Test, and Chen's Internet Addiction Scale. In terms of the risk factors, many exposure variables were studied and could be broadly classified into three main categories: psychopathologies of the participants, family and parental factors, and others such as Internet usage, motivation, and academic performance. In all these studies, appropriate statistical analytical approaches were employed including multivariate logistic regression modelling, Cox proportional hazard regression modelling, and the Structural Equation modelling with adjustments to some potential confounding factors in all studies but one. However, it was also noted that nearly all of these studies had utilised schools as the sampling unit, but none considered the effect of school in their analyses. The results of these studies suggested a number of potential risk factors of IA. For psychopathologies, Ko et al. found that Taiwanese young people who had been assessed with Attention Deficit and Hyperactivity Disorder, and hostility at baseline were at a higher risk of IA at follow-up with a Hazard Ratio of1.72 (95%C.I.=1.21-2.43) for the former and 1.67 (95%C.I.=1.17-2.68) for the latter.[25] Cho et al. also found that children who had been assessed with Withdrawal, Anxious/ Depressed, and Thought problems at childhood were also at a higher risk of IA 7 years later in adolescence with Odds Ratios of 1.16, 1.07, and 1.19 respectively.[39] In terms of familial and parental factors, Ko et al. reported that conflict between parent and child due to the Internet at baseline was significantly related to IA 12 months later (OR=2.31,

95%C.I.=1.28-4.18).[25] At the same time, not living with mother was also identified as a potential risk factor of IA in the same cohort of adolescents (OR=1.66, 95%C.I.=1.03-2.69). Other potential risk factors were also identified including usage of the Internet with a strong association between online gaming and IA (β=0.15, $p<0.001$),[24] and young people who had adopted the Behaviour Approach System as a motivation style were found to be more at risk of IA (OR=1.05 95%C.I.=1.02-1.09).[35] On the contrary, some protective factors were also reported from these studies. In the study by Van den Eijnden et al., it was found that quality communication between parents and children on Internet use at baseline significantly reduced the risk of compulsive Internet use at follow-up among young people in the Netherlands (β= -0.10, $p<0.05$).[26] A recent study in Hong Kong also revealed that higher scores of positive youth development significantly related to a lower risk of IA (OR=0.67).[38]

The effect of IA on mental health

The systematic search of longitudinal or prospective studies on the effects of IA on health of young people yielded only one study that satisfied the selection criteria of this review. The study was a longitudinal study on healthy Chinese young people who were depression free at baseline, with results indicating that those who had been classified as having moderate to severe risk of IA were about 2.5 times more likely to develop depressive symptoms and scored high enough on the Zung Depression Scale to be clinically significant in comparison to normal users at follow-up 9 months later.[30]

DISCUSSION and CONCLUSIONS

The structured PRISMA guidelines for systematic review were followed in this review study. The guidelines were established to ensure that proper and systematic procedures are implemented in the process of a systematic review. Nine studies fulfilled the selection criteria and contained potentially useful information on the risk or protective factors of IA as well as the effect of IA on the mental health of young people. The results of these studies provided some evidence on possible linkages between those risk or protective factors and IA, as well as the exposure to IA on the mental health of adolescents.

These results have shed some light on the aetiology of the problem as well as the effect of the problem on the health, particularly the mental health, of adolescents. It is apparent that the aetiology of IA is rather complex and there are a range of possible risk factors that may influence the onset and the development of the problem. As indicated from the results, these factors relate to different facets of adolescent life ranging from childhood development and psychopathologies, to communication with parents. These results have also contributed to the understanding and conceptualisation of the underlying aetiological mechanism of IA. As there are many proposed definitions, different conceptual frameworks have also been proposed as the theoretical basis for the understanding of IA, particularly among adolescents.[43,44] Among these theoretical models, stress or anxiety reduction has been proposed as a possible explanatory theory for IA.[45] According to this theory, the motivation for the behavioural maintenance of IA of “over-users” is that the Internet is used as a means for stress or tension reduction.[45] Another theory which has also been receiving much attention, especially for IA among adolescents, is the Problem Behaviour Theory.[46-48] The Problem Behaviour Theory advocates that there are three main systems, namely the personality, environment, and the behavioural systems, in the conceptual structure of any problematic behaviours in young people.[49,50] The propensity of any involvement in problematic behaviours is determined by the balance among risk and protective factors in the three systems.[50] Moreover, the behaviour system is also influenced by interactions between the personality and environment systems. According to Jessor et al., familial and parental

factors, such as parental behaviours and attitudes, are the main focus of the environment system, and risk factors in the personality system include lack of achievement, alienation, and self-dissatisfaction.[50] The results of this review render some support to the Problem Behaviour Theory of IA development among adolescents.

The results obtained from this review also have direct implications on the validation criteria of IA as a psychiatric problem. While Robins and Guze called for the evidence of follow-up studies as one the criteria for establishing the validity of a psychiatric diagnoses, Gentile et al also advocated the identification of risk and protective factors to be considered as an essential requirement for the establishment of a valid psychiatric diagnosis of IA.[16,17] The results seem to suggest successful identification of some risk and protective factors from the longitudinal and prospective studies. However, on closer examination one would find that the evidence derived from these results may not be as solid as one would wish. It is mainly due to the problem that, despite the fact that different instruments based on slightly different design conceptualisations were used for the assessment of IA, these studies were focused on different exposure variables. There is little overlap of exposure variables, except depression, across all these studies. In terms of pooling information together from different individual studies for the establishment of potential causal relationships between the exposure and the outcome variables in a specific area, the included studies in this review could not fulfil the task. There is a need for more studies of the same design focusing on the same area in order to offer evidence of sufficient quality for the establishment of the relationship. In this connection, it is suggested that these studies be repeated in other populations of young people at different geographical locations.

In conclusion, some potential risk and protective factors have been suggested from the included studies. In terms of the effect of IA, there is indicative evidence of the effect of IA on the mental health, particularly depression, of adolescents. The results of the review found that, due to the aforementioned limitations, more similar studies should be conducted to verify the findings of the reported studies in order to provide sufficient evidence for the fulfilment of the validation criteria of a psychiatric disorder.

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Table 1. Information extracted from individual longitudinal or prospective cohort studies on risk factors of Internet Addiction in adolescents.

Reference (Author, year, place)	Study design & methods	Participants	Exposure & Outcome Variable	Method of analysis	Variables Adjusted	Results	Comments
Van den Eijnden et al. (2008), Netherlands [24]	Design: Self-reported questionnaire surveys at two times. Follow-up duration: 6 months in between two surveys	Eighth grade students from 4 schools recruited form the southern part of the Netherlands (N=660)	Exposure variable: • Internet usage assessed by the frequency of different Internet usages; • Depressive symptoms assessed by the Depressive Mood List ; • Loneliness measured by the Loneliness Scale. Outcome variable: Compulsive Internet use assessed by the Compulsive Internet Use Scale	Data were analysed using structural equation modelling (SEM). Of interest to this review was the cross-lagged analysis with panel data. More specifically was the effect of the exposure variable on the outcome variable.	Instant messaging, depression, loneliness, and compulsive Internet use from time 1 were included in the model as predictor of the same four variables at time 2. Separate analyses were conducted for males and females for testing the moderating effect of gender.	Instant messaging at time 1 was positively and significantly associated with compulsive Internet use for girls at time 2 (β=0.14, $p<0.05$), but not for males.	• The same cohort was followed with low attrition rate. • No adjustment made for school effect.
Ko et al. (2009),	Design:	Seventh grade	Exposure	Data were	Age and gender	ADHD was	• The

Taiwan [25]	Self-reported questionnaire surveys at baseline and other three time points Follow-up duration: 6, 12, and 24 months.	students randomly selected from 10 junior high schools with 4 urban, 4 suburban, and 2 rural schools in southern Taiwan in 2005. Only those who were assessed without Internet Addiction at baseline were included in the analysis (N=1848)	variable: • Attention Deficit/hyperactivity disorders assessed by the ADHD Self-rated Scale; • Depression assessed by the CED-D; • Social phobia measured by Fear of Negative Evaluation Scale; • Hostility assessed by Buss-Durkee Hostility Inventory-Chinese Short Form. Outcome variable: Internet Addiction measured by the Chen Internet Addiction Scale.	analysed using Cox proportional hazard regression model.		significantly associated with Internet Addiction (HR=1.72, 95%C.I.=1.21-2.43). Hostility was also associated with Internet Addiction (HR=1.67, 95%C.I.=1.17-2.38)	relationship between exposure and outcome variables was examined in a cohort without Internet Addiction at baseline. • No adjustment made for school effect.
Van den Eijnden et al. (2010), Netherlands [26]	Design: Self-reported online questionnaire surveys at	Adolescents aged 10 to 15 who used the MSN instant messenger were	Exposure variable: Internet specific parenting practices	Data were analysed using structural equation modelling	Internet parenting practices at T2 and Compulsive Internet use at	Quality communication about Instant use at time 1 significantly	• High attrition rate at follow-up with only 31% responded

	baseline in 2006 and a follow-up Follow-up duration: 6 months.	recruited through an advertising banner with 1647 respondents at baseline and 510 responded at follow-up. Response rate was 31%.	assessed by a newly developed Internet parenting practice scale designed and validate by the authors. Outcome variable: Compulsive Internet use assessed by the Compulsive Internet Use scale also designed and validated by the authors	(SEM). Of interest to this review was the cross-lagged analysis with panel data. More specifically was the effect of the exposure variable on the outcome variable.	T1 were included in the analysis. Age, gender and school were also included in the model to control for their effects.	decreased the risk of compulsive Internet use at time 2 (β= -0.10, p<0.05),	both surveys. Drop-outs analysis indicated that drop-outs were more likely to follow a lower level of education than the respondents of both surveys. • Potential sampling bias that might cause problem in generalising the results. • Adjustment made for school effect.
Van Rooij et al. (2010), Netherlands [28]	Design: Self-reported questionnaire surveys in two consecutive years in 2007 and 2008. Follow-up duration: 12 months between two surveys	Junior high school students age 13-15 years, recruited from 9 secondary schools (N=1421)	Exposure variable: Internet usage, including game playing and others, assessed by questions of frequency of use. Outcome variable: Compulsive Internet use assessed by the	The focus of analysis was on the relationship between the change of Internet usage over time and the change of Compulsive Internet use over time. Data were analysed using multiple linear regression.	Age, sex, education, and ethnicity	Changes of Internet activities, except surfing and mailing, were significantly associated with changes of Compulsive Internet use with the strongest association being online gaming (β=0.15,	• The study aimed to investigate the change of Compulsive Internet Use behaviour in relationship to the change of Internet usage, but not a direct examination of the aetiological

			Compulsive Internet Use scale			p<0.001)	factors of Internet addictive behaviours. • No adjustment made for school effect.
Yen et al. (2012), Taiwan [35]	Design: Self-reported questionnaire surveys in two consecutive years. Follow-up duration: 12 months between two surveys	Seventh grade students randomly selected from 10 junior high schools with 4 urban, 4 suburban, and 2 rural schools in southern Taiwan in 2005. Only those who were assessed without Internet Addiction at baseline were included in the analysis (N=1578)	Exposure variable: Motivation factors, Behaviour Inhibition System (BIS) and Behaviour Approach System (BAS) according to the Gary's reinforcement sensitivity theory. BIS/ BAS were assessed using the BIS/BAS scales. Outcome variable: Internet Addiction measured by the Chen Internet Addiction Scale.	Data were analysed using logistic regression modelling. Of interest of this review was the predictive value of the BIS and BAS on Internet Addiction	Age and gender	There was a significant relationship between BAS at baseline and Internet Addiction 12 months later (OR=1.05 95%C.I.=1.02-1.09)	• The same study cohort as that report previously by Ko et al. 2009 [Ref]. • No adjustment made for school effect.
Yu & Shek	Design:	Students were	Exposure	Data were	Age, gender,	Higher scores of	• No adjustment

(2013), Hong Kong [38]	Self-reported questionnaire surveys at 3 waves of data collection. This study only utilised data collected in wave 1 and 3. Follow-up duration: Waves 1had been conducted in 2008 and waves 3 was in 2011/12.	recruited from 28 secondary schools selected from all secondary schools in Hong Kong. Included in the study were those who could be matched across all three waves of survey. (N=2667)	variable: • Family factors assessed by the Chinese Family Assessment Instrument • Positive Youth Development measured by the Chinese Positive Development Scale • Academic Performance assessed by the Academic and School Competence Scale. Outcome variable: Internet Addiction measured by the Young's 10 Internet Addiction Test.	analysed using logistic regression modelling with data collected on exposure variables in wave 1 as predictors.	demographics, parental marital status.	positive youth development significantly related to lower risk of Internet Addiction (OR=0.67)	for baseline Internet Addiction. • No adjustment made for school effect.
Cho et al. (2013), Korea [39]	Design: Parent-reported questionnaire survey at baseline in	Students were recruited from all primary schools in a small city. Of the 1112 boys	Exposure variable: Childhood psychopathology assessed by the	Data were analysed using simple logistic regression modelling to	None	Three symptoms were identified to be related to Internet Addiction at	• No comparison between those who were followed and

	1998/99 and respondent self-reported questionnaire survey in 2006. Follow-up duration: 7 years in between two data collection.	in the original cohort, 524 obtained matched data between baseline and follow-up. The study utilised the subset of data with complete information. (N=489)	Child Behavioural Checklist (CBCL). Outcome variable: Internet Addiction measured by the Korean version of the Internet Addiction Scale.	ascertain the association between each psychological symptom and Internet Addiction		follow-up. Withdrawal (OR=1.16), Anxious/Depressed (OR=1.07), Thought problems (1.19). The total Internalising (1.04), Externalising (OR=1.03) and the total score (OR=1.01).	those who were lost-to-follow thus constituted a potential sampling bias. • No adjustment to any potential confounding factors might cause possible confounding bias.
Ko et al. (2014), Taiwan [41]	Design: Self-reported questionnaire surveys at baseline and at follow-up. Follow-up duration: 12 months.	Seventh grade students randomly selected from 10 junior high schools with 4 urban, 4 suburban, and 2 rural schools in southern Taiwan in 2005. Only those who were assessed without Internet Addiction at baseline were included in the analysis (N=1630)	Exposure variable: Family factors assessed by the Family APGAR Index for family function Outcome variable: Internet Addiction measured by the Chen Internet Addiction Scale.	Data were analysed using logistic regression modelling with data collected on exposure variables at baseline as predictors.	Age and gender	Internet parental conflict was significantly related to Internet Addiction at follow-up (OR= 2.31, 95%C.I.=1.28-4.18). Not living with mother was also significantly associated with Internet Addiction 1 year later (OR=1.66, 95%C.I.=1.03-2.69)	• The same study cohort as that report previously by Ko et al. 2009 [Ref]. • The relationship between exposure and outcome variables was examined in a cohort without Internet Addiction at baseline. • No adjustment made for school effect.

Table 2. Information extracted from individual longitudinal or prospective cohort studies on the effects of Internet Addiction on health in adolescents

Reference (Author, year, place)	Study design & methods	Participants	Exposure & Outcome Variable	Method of analysis	Variables Adjusted	Results	Comments
Lam & Peng (2010), China [30]	Design: Self-reported questionnaire surveys at baseline and at follow-up Follow-up duration: 9 months.	A sample of high school students was recruited by a random selection form the city school registry. Only those who were assessed without mental health problems including depression and anxiety at baseline were included in the analysis. (N=1041)	Exposure variable: Pathological use of the Internet assessed by the Young's Internet Addiction Scale (IAT) Outcome variables: • Depression assessed by the Zung Self-rating Depression Scale • Anxiety measured by the Zung Self-rating Anxiety Scale	Data were analysed using Poisson regression model with binary outcome.	Age, sex, urban or rural school, family location, serious illness, involvement in physical activities, family dissatisfaction, and study burden.	PIU was significantly associated with depression at follow-up (IRR=2.5, 95%C.I.=1.3-4.3), but not anxiety.	• Exposure and outcome assessments relied upon self-reported information, subjected to report biases. • Drop-out analysis conducted suggesting no difference between drop-outs and retainers.