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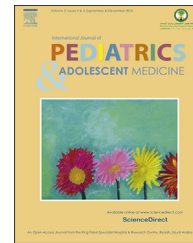


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ORIGINAL RESEARCH ARTICLE

Student, school, parent connectedness, and school risk behaviors of adolescents in Saudi Arabia



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KEYWORDS

Saudi Arabia;
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Abstract *Background and Objectives:* School-related risk behaviors, such as school absenteeism, and engaging in violence on school property are scarcely addressed in the Kingdom. The study investigated select school behaviors, including school absenteeism, engaging in fights, and discipline for misconduct at school as well as their association with the school environment, school and home connectedness.

Design and setting: A school-based cross-sectional study.

Materials and methods: A total of 1668 students were selected from high schools in Riyadh on the basis of geographical location (North, South, Middle) and type of school. In each geographical area, the two largest public schools, one private school and one international school were selected. Classrooms with a free period were selected at random, and all of the students in select classrooms were eligible to participate in the study. The study employed a self-administered survey that inquired about school behaviors and student connectedness with their parents and school.

Results: Nearly 54% of students skipped school or cut classes for at least 1 h, and out of those students who skipped school, 37% of students skipped school for 1–3 h and 20% of students skipped school for 3 or more hours during the month prior to the survey. Thirty-eight percent of students engaged in fights on school property at least once during the past or current academic year. In addition, 37% of students were disciplined for engaging in school fights, theft or damaging school property at least once.

Absenteeism increased with grade, while engaging in school fights and discipline for misconduct decreased with grade. A significantly higher proportion of males exhibited these

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behaviors, and students who exhibited these behaviors reported significantly lower levels of school connectedness and parental monitoring. Regression analyses suggested that school-student connectedness reduced the odds for all three risk behaviors examined in this study. Parental monitoring reduced the odds for absenteeism, and school policies reduced student involvement in school fights.

Conclusion: This study highlights the need to develop strategies to enhance the best practices in school settings to promote positive student behavior and school achievement. Schools and parents should be encouraged to work as a team and to recognize the importance of school connectedness in improving positive student behavior and outcomes.

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1. Introduction

The research focus on the Saudi adolescent population has been on diet, exercise, physical inactivity [1] and related health conditions, including nutritional deficiencies [2]. However, recent studies on the mental health of adolescents, such as depression, anxiety and stress, have begun to emerge [3]. Other health-compromising behaviors, such as smoking, have also been frequently studied among youths [4–6], which is a major public health concern in Saudi Arabia. Smoking rates among youths range between 30% and 37% [7–9]. Although school children are recurrent subjects for the study of nutrition, obesity, and smoking, risk behaviors associated with school achievement and factors that might affect those behaviors have not been addressed in the Kingdom. School-based data provide a great opportunity to address other risk behaviors, such as school absenteeism and engaging in violence on school property, which have scarcely been addressed. School climate has also been linked to multiple student behavioral, academic, health, and social-emotional outcomes [10].

The current study aimed to examine school behaviors, including school absenteeism and engaging in physical violence at school as well as their association with student connectedness with the school and their parents. Habitual absenteeism from school can be a serious health concern for mental health professionals, physicians, and educators. The prevalence of unexcused absences from school may be a major childhood behavioral disorder and a key risk factor for violence, injury, substance use, psychiatric disorders, and economic deprivation [11]. To the best of our knowledge, contextual risk factors, such as school violence and victimization, school environment and connectedness, parental involvement, and family variables, have not been examined in the Saudi culture.

School connectedness refers to the belief held by students that adults and peers in the school care about their education as well as about themselves as individuals, which is an important protective factor. Research has shown that youths who feel connected to their school are less likely to engage in many risk behaviors, including early sexual initiation, alcohol, tobacco, and other drug use, and violence and gang involvement. Students who feel connected to their school are also more likely to have better academic achievement, including higher grades and test

scores, have better school attendance, and stay in school longer [12,13]. Efforts to improve child and adolescent health have typically addressed specific health risk behaviors, such as tobacco use or violence. However, a growing body of research suggests that enhancing protective factors help children to avoid multiple behaviors that place them at risk for adverse health and educational outcomes [14]. In addition, a positive school environment has proven to deter children from engaging in school violence, particularly in preventing the initiation and reducing the severity of school violence [15]. However, little is known regarding the relative importance of various characteristics of the school environment or their differential effects on skipping school and engaging in school violence in Arab school youths. These important factors have never been systematically studied in the Kingdom of Saudi Arabia.

Parental monitoring is “a set of correlated parenting behaviors involving attention to and tracking of the child’s whereabouts, activities, and adaptations” [16]. Research on parenting practices has revealed parental monitoring to be relevant to the development of childhood antisocial behavior and substance use [17,18]. Parental monitoring is also associated with the positive dimensions of the children’s adjustment in middle childhood, including self-esteem [19], academic achievement [20], and high school completion [21]. A number of risk factors have been identified, including familial environment, however, few studies have examined the effect of parental monitoring on risk behaviors associated with school, in particular, among Saudi adolescents.

Given this background, the main purpose of this study was to investigate select school behaviors, including school absenteeism and engaging in physical violence, and discipline for misconduct at school and their association with the school environment, adolescent school and home connectedness. We hypothesized that a positive school environment and connectedness with the school and home have negative associations with school-related risk behavior.

2. Materials and methods

The study participants were randomly drawn from high schools in Riyadh, the capital and largest city in Saudi Arabia. Schools were selected on the basis of their

geographical location and type of institution. Riyadh was divided into three geographical areas for sampling purposes (North, South, Middle). In each geographical area, the two largest public schools, one private school, and one international school were selected. Approximately 60 classes with a free period were selected at random, which had 25–40 students per classroom on average. All of the students in the selected classrooms were eligible to participate in this study.

Prior to the administration of this the survey, a committee visited each school to explain the purpose of the study to the students, and an informational letter and consent form were sent home to the parents. Students were informed that participation in the study was completely voluntary. Four research teams consisting of health professionals (e.g., nurses, health coordinators) collected data from November 2010 to February 2012. Ethical approval for the study was obtained from the King Fahad Medical City Institutional Review Board, and permission was obtained from the Ministry of Education in Riyadh to administer the survey in the schools.

2.1. Survey development and validity

A comprehensive adolescent health survey was developed for Saudi youth on the basis of an extensive literature review of adolescent health and questions adopted from the Youth Risk Behavior Survey used in the United States. This national survey has been validated over the past several years in the United States. Using these standard questions, our survey has high face validity and credibility. Questions on family and school connectedness were developed by consulting experts in adolescent health to achieve face validity. Furthermore, we also performed exploratory factor analysis and used principal component analysis (PCA) to examine factor loadings for scale construction. The validity of the scales was confirmed by computing Cronbach's Alpha for each scale.

The survey inquired about the adolescents' behaviors and attitudes and included questions on smoking behavior, perceptions of school and family, student attachment to school and family, use of technology, school activities, and activities outside of school. The survey items were translated to Arabic and then back translated to English by bilingual professionals. The survey was administered in the language that the student preferred.

2.2. Measures

Outcomes (dependent variables): We considered the following three school-related risk behaviors as outcomes for this study.

- a) *School absenteeism* was assessed by asking "During the last month, how many times have you skipped or "cut" classes or school days?" with response categories of none, 1–3, 4–6, or more than 6 h.
- b) *Engaged in school fights on school property:* "In the past and/or the current academic year, how often have you been involved in a physical fight on school property?"

with response categories of none, 1 or 2 times, 3–5 times, or 6 or more times.

- c) *Disciplined for misconduct*, i.e., engaging in school fights, thefts or damaging school property: "In the past and/or the current academic year, how often have you been disciplined at school for fighting, theft, or damaging property?" with response categories of none, 1 or 2 times, 3–5 times, or 6 or more times.

2.3. Independent variables

Demographic information of the schools and students included: Type of school: Government, Private, or International, Grade: 8th thru 12th grades, Gender: Male or Female, and Ethnic group: Saudi, Arab, Neither Saudi nor Arab.

Scales: The following scales were constructed for this study. Factor analysis was performed using school-related items and parent-related items separately to reduce the number of variables and to detect the structure of the relationships between variables. We used principal component analysis with the varimax rotation option and retained only factors with eigen values greater than 1. On the basis of the factor analysis, the following scales were computed and used.

All of the items used in the following scales construction were measured on a 4-point-Likert scale (ranging from strongly agree (1) to strongly disagree (4)) and were reverse encoded appropriately and summed. Higher scores indicated the desired direction.

- a) *School environment* assessed whether there were opportunities to engage in after school activities (sports, music, etc.) and was grouped into two categories: yes = strongly/agree and no = disagree/strongly disagree.
- b) *School policies* scale included two items (alpha = .56) ("There are clear rules about what students can and cannot do" and "The school principal and teachers consistently enforce school rules", students caught smoking will be punished") with a mean = 7.9, SD = 2.6).
- c) *School-student connectedness scale* included 7 items (alpha = .82) – ("my teachers care about me," "teachers are available to talk with a student one-on-one," "When I am doing a good job, my teachers notice and let me know about it," "Students in my school treat each other with respect," "I feel safe at school," "I care about my school," and "There is at least one adult at school who I could go to for help with a problem."), mean = 17.87, SD = 5.5).
- d) *School-parent communication* scale includes 3 items (alpha .60) – "If I skipped school at least one of my parents/guardians would be notified," "If I got in trouble at school for breaking a rule, at least one of my parents/guardians would support the school's disciplinary action," and "My school lets a parent/guardian know if I've done something wrong." (mean = 8.2, SD = 2.64).
- e) *The parent monitoring scale* includes 8 items, (alpha = .77, mean = 14.6, SD = 5.3) with response

categories: never, sometimes, often, and always (Items: A parent knows where I am and who I am with, particularly in the evening and on weekends., A parent/guardian generally determines if I have done something wrong, and then punishes me, When I am doing a good job, someone in my home lets me know about it: "Someone in my home helps me with my school work," "At least one of my parents goes to school activities that I am involved in," "I can talk about the things that bother me or I don't understand with someone in my house," and "My family influence what I do.").

2.4. Data analysis

Univariate descriptive statistics were examined, and the variables were regrouped as suggested by the distribution. Descriptive statistics were calculated and expressed as the mean and standard deviation or as a percentage. To test for bivariate associations between the three school risk behaviors and predictors, cross tabulations with the χ^2 option were performed for categorical variables with a significance level set at $P < .05$. To test the group mean differences for scale scores, T-tests were performed with a significance level set at $P < .05$. For multivariable analysis, logistic regression models were run separately for each of the three risk behaviors, absenteeism (at least 1 h vs. never), engaged in school fights (at least once vs. never), and disciplined for misconduct (at least once and never), which were classified into dichotomous variables on the basis of the distribution. The relative odds and 95% confidence intervals were estimated. All analyses were performed using SPSS Statistics (Version 22.0) software (IBM Corp., Armonk, NY, USA).

3. Results

A total of 1668 students (7th through 12th grade) from governmental (41%), private (32%), and international schools (27%) in Riyadh were surveyed. Male and female (51%) students were equally represented in the survey, and nearly all of the students were of the Islamic faith (98.4%). Nearly two-thirds of the participants were Saudi (61%), 30% were Arab, and approximately 9% were of other cultures.

3.1. School risk behaviors and relationship with predictors

Nearly 54% of students skipped school or cut classes for at least 1 h, and out of those students who had skipped school, 37% of the students skipped school for 1–3 h and 20% of the students skipped school for 3 or more hours during the last month prior to the survey. Thirty-eight percent of the surveyed students reported engaging in fights on school property at least once during the past or current academic year. Discipline for engaging in school fights, thefts or damaging school property at least once was reported in 37% of students.

Table 1 represents bivariate associations between the outcomes and predictor variables considered in the analysis. Absenteeism was significantly associated with all of

the demographic variables, and students who skipped school had significantly lower mean scores on school policies, school-student connectedness, and parental monitoring. As shown in Table 1, absenteeism demonstrated a positive association, which was reflected by higher proportions with an increase in grade. School absenteeism was also significantly higher in male Saudi students.

Nearly two-thirds (67%) of the students surveyed reported that there were abundant opportunities for involvement in after school activities, including sports, music, and so on. However, bivariate analyses indicated that this factor was only associated with absenteeism. Engagement in school fights was significantly associated with all of the demographic variables, except with the ethnic group. Students who reported engaging in school fights had significantly lower mean scores on school policies and school-student connectedness. Discipline for school misconduct was also significantly associated with all of the demographic variables. Students who were disciplined at school had significantly lower scores on school-student connectedness and parental monitoring. In general, a higher proportion of male students engaged in physical fights and was disciplined for school misconduct. The main interesting observation from the bivariate analyses differed from absenteeism and engaging in school fights, and discipline for misconduct decreased with an increase in grade.

Table 2 shows the results obtained from the logistic regression models. Male students showed a clear increase in the odds for all three school risk behaviors. Importantly, male students also demonstrated three times greater odds to engage in school fights and nearly twice the odds for disciplinary action at school compared to female students. Native Saudi students also demonstrated higher odds for absenteeism and receiving disciplinary actions at school. School-student connectedness demonstrated reduced odds for all three risk behaviors. In addition, parental monitoring also reduced the odds for absenteeism and school policies in reducing student involvement in school fights.

4. Discussion

Mental health professionals and educators are encouraged to fully understand the dynamics of the parameters that result in school risk behaviors to develop better, consensual policies and intervention programs. In this study, we examined the relationship between school risk behaviors in adolescents and connectedness and bonding between adolescents and their school and parents. School-student connectedness reduced the odds of school absenteeism, engagement in school fights, and discipline for misconduct. Our study provides strong evidence in support of school-student connectedness in the reduction of school risk behaviors. Furthermore, parental monitoring also reduced the odds of absenteeism, and school policies reduced student involvement in school fights. Parent monitoring of their children's behavior is considered to be an essential parenting skill. Numerous studies have shown that well-monitored youths are less involved in delinquency and other norm-breaking behaviors. Parental monitoring and school policies are also important for reducing absenteeism and engaging in school fights, respectively. Parental

Table 1 Association between school risk behavior, demographics, and school and family connectedness (N = 1668).

	Absenteeism (%)			Involved in school fight (%)			Disciplined for school misconduct (%)		
	Yes	No	X ² (df) sig	Yes	No	X ² (df) sig	Yes	No	X ² (df) sig
Type of school			26.0 (2)***			16.5 (2)***			7.1 (2)*
Govt (n = 662)	56	44		32	68		34	66	
Private (n = 520)	61	39		42	58		41	59	
International (n = 445)	44	56		42	58		38	62	
Grade			17.6(4)**			18.2(4)***			14.2(4)**
7/8 (n = 286)	48	52		30	70		29	71	
9 (n = 271)	49	51		41	59		37	63	
10 (n = 333)	55	45		46	54		44	56	
11 (n = 402)	57	43		36	64		36	64	
12 (n = 320)	63	37		36	64		38	62	
Gender			24.2(1)***			97.2(1)***			30.7(1)***
Male (n = 799)	61	39		49	51		44	56	
Female (n = 822)	48	52		25	75		30	70	
Ethnic group			42.9(2)***			3.8(2)			9.0(2)**
Saudi (n = 1014)	61	39		36	64		38	62	
Arab (n = 490)	47	53		42	58		39	61	
Neither (n = 144)	35	65		37	63		25	75	
Opportunities for extracurricular activities at school			17.7(1)***			0.56(1)			1.1(1)
Yes(n = 982)	59	41		38	62		38	62	
No (n = 479)	47	53		36	64		35	65	
Scales (T-test)									
	Absenteeism (%)		Involved in school fights (%)		Disciplined for school misconduct (%)				
	Mean difference	t-Value sig	Mean difference	t-Value sig	Mean difference	t-Value sig			
School policies	-0.384	-2.9**	-0.481	-3.54***	-0.214	-1.56			
School-parent communication	-0.255	-1.9	-0.197	-1.41	-0.143	-1.03			
School-student connectedness	-0.703	-2.5**	-1.77	-6.06***	-0.942	-3.27***			
Parental monitoring	-1.765	-6.42***	-0.438	-1.55	-0.524	-1.91*			

Percentages rounded to the closest integer. P-value sig * ≤ .05 ** ≤ .01 *** ≤ .001.

involvement in their child's education has been consistently found to be positively associated with the child's academic performance [22,23]. In particular, positive outcomes are achieved when the parents remain cognizant of their child's activities, monitor their child's behavior, and raise their children in a structured environment [16,24]. Cross-sectional, longitudinal, and interventional studies have demonstrated that monitored youths are less likely to engage in substance use and delinquent behavior or to spend time with deviant peers [24–29]. Research evidence indicates a direct link between parental monitoring and positive youth outcomes [27], and parental monitoring can deter deviant peer influences on youth substance use or anti-social behavior [29,30]. A recent meta-analysis by Jeynes indicated that the association between father involvement and the educational outcomes of youth overall is significant [31].

When we examined parental involvement in school-related activities separately, one-third of the students surveyed reported that their parents never helped them with their homework (38%) or only helped sometimes (36%).

One-third of students (35%) indicated that their parents never attended any of the school activities or attended only

some of the activities (40%) in which they were involved. These data reflect low parental involvement in school-related activities, demonstrating the need for school officials to plan activities that promote parental involvement.

In the Saudi culture, less emphasis has been placed on extra-curricular activities in general, which makes it more difficult for parents to become involved with their children's school. The annual parent-teacher meeting is the main opportunity for a parent to visit the schools. Only conscientious parents schedule additional visits. Furthermore, it is not a social expectation nor is it painted into the "ideal family picture" in which parents should attend their children's school activities, which is a typical behavior of Western cultures. This could be due to the inherent lack of activities in the school systems or the parents' pre-occupation with other activities that often have a priority over becoming involved with their children's school events. Social roles in Saudi culture are strictly defined, such that the father is the sole bread-winner and the mother is the housekeeper.

The striking evidence that school-student connectedness reduces the odds of school risk behaviors is the highlight of our findings. Our findings highlight the components of

Table 2 Results from logistic regression – odds ratios and 95% confidence intervals (CI) predicting school risk behaviors.

	Absenteeism (n = 1283)		Involved in school fight (n = 1395)		Disciplined for school misconduct (n = 1374)	
	OR	95% CI	OR	95% CI	OR	95% CI
School type (ref: International)						
Govt	0.73	0.49, 1.1	1.24	0.896, 1.7	1.32	0.97, 1.8
Private	0.96	0.64, 1.4	1.67**	1.15, 2.4	1.45	0.99, 2.1
Grade (ref:7–8th grade)						
9	1.2	0.83, 1.84	1.36	0.91, 2.1	1.27	0.86, 1.9
10	0.95	0.62, 1.45	1.1	0.704, 1.7	1.29	0.85, 1.95
11	1.3	0.86, 1.9 1	0.79	0.532, 1.2	0.99	0.67, 1.5
12	1.73**	1.15, 2.6	0.72	0.474, 1.1	1.01	0.68, 1.5
Gender (ref: female)						
Male	1.3*	1.01, 1.66	3.3***	2.53, 4.25	1.77***	1.38, 2.26
Ethnic group (ref: other)						
Saudi	2.41***	1.48, 3.9	—	—	2.07**	1.25, 3.4
Arab	1.41	0.88, 2.6	—	—	2.2***	1.35, 3.6
Extracurricular opportunities						
School policies	0.98	0.93, 1.03	0.95*	0.900, .99	0.99	0.945, 1.04
School-parent communication	0.98	0.94, 1.04	1.02	0.97, 1.08	0.99	0.946, 1.04
School-student connectedness	0.96**	0.94, 0.98	0.95***	0.93, .98	0.97*	0.95, 0.997
Parental monitoring	0.96**	0.93, 0.98	0.98	0.953, 1.01	0.98	0.95, 1.01

P-value sig * $\leq .05$ ** $\leq .01$ *** $\leq .001$.

school connectedness and identifies specific actions that schools can take to increase connectedness with adolescents. The items that we included in this scale refer to the attachment and bonding between teachers, school and students as well as the care displayed to the students in the school environment. The feeling that there is someone at the school to help with problems is critical in establishing a positive school environment. Students are more likely to engage in healthy behaviors and to succeed academically when they feel connected to their school. The National Longitudinal Study found that family, school, and individual factors, such as school connectedness, parent-family connectedness, and high parental expectations for academic achievement, were protective against a range of adverse behaviors [32,33]. School connectedness was found to be the strongest protective factor for both boys and girls against substance use, school absenteeism, early sexual initiation, violence, and risk of unintentional injury (e.g., drinking and driving, not wearing seat belts) [32]. Furthermore, school connectedness was second in importance, after family connectedness, as a protective factor against emotional distress, disordered eating, and suicidal ideation and attempts [32–34]. A strong relationship between school connectedness and educational outcomes, including school attendance and better grades, was also noted in the research [35]. Better school performance (higher grades) is a protective factor against carrying a weapon, smoke cigarettes, or consuming alcohol [36–38].

Our study found school policies to be associated with a reduction in student involvement in school fights. Schools in Riyadh may also focus on creating a positive environment by offering after school activities and organized events for students to participate in. The psychosocial climate at school is affected by school policies related to discipline,

opportunities for meaningful student participation, and the teachers' classroom management practices. Research indicates that in schools with a harsh and punitive discipline climate, there is lower student connectedness [34–39]. However, a positive school environment must also include caring and supportive interpersonal relationships, opportunities to participate in school activities and decision-making, and shared positive norms, goals, and values [40]. Schools that have higher rates of participation in extracurricular activities during or after school tend to have higher levels of school connectedness [34]. Connectedness is enhanced by a healthy and safe school environment and a supportive psychosocial climate. School staff who are dedicated to the education of their students build school communities that enable students to develop emotionally, socially, and mentally as well as academically. Committed school staff can also engage students in learning, foster mutual respect and caring, and meet the personal learning needs of each student.

4.1. Study strengths and limitations

As with any survey research, our study also suffers from classic limitations. The study involved self-reporting, and therefore, many of the risk behaviors measured might have been under reported, resulting in lower prevalence estimates. Furthermore, students with literacy challenges may not have understood or answered reliably. The other challenges included missing data due to nonresponses or the selection of the "don't know" option, which was set as missing, resulting in at least 15% missing responses for any given variable. The study was conducted only in the city of Riyadh, thus, these results may not be representative of adolescents in the entire Kingdom, particularly, rural

provinces. This result would limit the generalisability of our study results for other youths living in rural and urban areas in the Kingdom. Nevertheless, the study strengths included a large sample that was randomly selected to represent students across age groups and that schools were selected based on the type and geographical location in Riyadh, the largest city in the Kingdom, with a population of nearly five million people.

5. Conclusion

Families, schools, and communities need to work together to create an environment that facilitates the healthy development of children and adolescents. Effective parenting practices play a critical role in preventing and reducing youth problem behaviors. Our study and other relevant research showed that students who feel connected to school are more likely to have positive health and education outcomes. Evidence-based health promotion programs and strategies that enhance connectedness can also help schools to have the greatest impact on the health and education outcomes of their students. Because school connectedness is a particularly promising protective factor, strategies to increase connectedness must be developed by the Saudi Ministry of Education and implemented in schools across the Kingdom. For example, the CDC has proposed a framework consisting of six key strategies to improve student connectedness that can be easily adopted in any school setting [37]. Engaging students, parents, school staff, and community members in teams to develop school policies, plan school-wide activities, and create trusting and caring relationships that promote open communication among administrators, teachers, staff, students, families, and communities are some of the key strategies.

5.1. Implications for school health

This study has implications for the development of strategies to enhance the best practices in a school setting to promote student positive behavior and school achievement. Schools and parents should be encouraged to work as a team and to recognize the importance of school connectedness in improving the students' health and education outcomes. It is also important to evaluate efforts to increase school connectedness to learn which actions will have the greatest effect. Relationships with parents are a key factor in the development of youths. Youths who feel close to their caregivers tend to value their opinions more highly and are more likely to seek guidance for difficult situations [41]. For the most part, it is not customary for schools in Saudi Arabia to involve parents, in part because most existing parental interventions require a significant time commitment by parents. There is also a great need for risk-reduction intervention programs that are implemented by schools.

Human subjects approval statement

Ethical approval for the study was obtained from King Fahad Medical City Institutional Review Board along with

the permission from the Ministry of Education in Riyadh to administer the survey in schools.

Conflict of interest

None.

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References

- [1] Alzahrani SG, Watt RG, Sheiham A, Aresu M, Tsakos G. Patterns of clustering of six health-compromising behaviours in Saudi adolescents. *BMC Public Health* 2014 Nov 25;14:1215. <http://dx.doi.org/10.1186/1471-2458-14-1215>.
- [2] Abalkhail BA, Shawky S, Soliman NK. Validity of self-reported weight and height among Saudi school children and adolescents. *Saudi Med J* 2002;23(7):831–7.
- [3] Al Gelban KS. Prevalence of psychological symptoms in Saudi secondary school girls in Abha, Saudi Arabia. *Ann Saudi Med* 2009;29(4):275–9. <http://dx.doi.org/10.4103/0256-4947.55308>.
- [4] Ahmed Mandil, Abdulaziz BinSaeed, Shaffi Ahmad, Mohammad Yamani, Nouf Turki, Mohammad Al-Enzi, et al. Pattern of tobacco consumption and influencing factors among male school children in Riyadh, Saudi Arabia. *J Addict Res Ther* 2014;5:192. <http://dx.doi.org/10.4172/2155-6105.1000192>.
- [5] Al-Zalabani Abdulmohsen H, Amer Soliman M, Kasim Khaled A, Alqabshawi Reem I, Abdallah AR. Second-hand smoking among intermediate and secondary school students in Madinah, Saudi Arabia. *BioMed Res Int* 2015. Article ID 672393, [in press].
- [6] Al-Makadma AS, Moynihan M, Dobson S, Saewyc E. Tobacco use among adolescents in Riyadh Saudi Arabia. *Int J Adolesc Med Health* 2014 Aug 15. <http://dx.doi.org/10.1515/ijamh-2014-0023>. pii:/j/ijamh.ahead-of-print/ijamh-2014-0023/ijamh-2014-0023.xml.
- [7] Medhat MB. Smoking in Saudi Arabia. *Saudi Med J* 2009;30(7):876–81.
- [8] Al-Damegh SA, Saleh MA, Al-Alfi MA, Al-Hoqail IA. Cigarette smoking behavior among male secondary school students in the Central region of Saudi Arabia. *Saudi Med J* 2004;25(2):215–9.
- [9] Fida HR, Abdelmoneim I. Prevalence of smoking among secondary school male students in Jeddah, Saudi Arabia: a survey study. *BMC Public Health* 2013;13:1010. <http://dx.doi.org/10.1186/1471-2458-13-1010>.
- [10] Pas ET, Cash AH, O'Brennan L, Debnam KJ, Bradshaw CP. Profiles of classroom behavior in high schools: associations with teacher behavior management strategies and classroom composition. *J Sch Psychol* 2014;53(2):12.005. <http://dx.doi.org/10.1016/j.jsp>.
- [11] Kearney CA. An interdisciplinary model of school absenteeism in youth to inform professional practice and public policy. *Educ Psychol Rev* 2008;20:257–82.
- [12] Carlson SA, Fulton J, Lee SM, Maynard M, Brown DR, Kohl III HW, et al. Physical education and academic

- achievement in elementary school: data from the early childhood longitudinal study. *Am J Public Health* 2008;98(4):721–7.
- [13] MacLellan D, Taylor J, Wood K. Food intake and academic performance among adolescents. *Can J Dietetic Pract Res* 2008;69(3):141–4.
- [14] Centers for Disease Control and Prevention, School connectedness. CDC 2014 <http://www.cdc.gov/healthyyouth/protective/connectedness.htm> accessed on 14.06.15.
- [15] Johnson SL, Burke JG, Gielen AC. Prioritizing the school environment in school violence prevention efforts. *J Sch Health* 2011 Jun;81(6):331–40. <http://dx.doi.org/10.1111/j.1746-1561.2011.00598.x>.
- [16] Dishion TJ, McMahon RJ. Parental monitoring and the prevention of child and adolescent problem behavior: a conceptual and empirical formulation. *Clin Child Fam Psychol Rev* 1998;1 (pp.61) 61–75.
- [17] Dishion TJ, Loeber R. Male adolescent marijuana and alcohol use: the role of parents and peers revisited. *Am J Drug Alcohol Abuse* 1985;11:11–25.
- [18] Monahan KC, Steinberg L, Cauffman E, Mulvey EP. Trajectories of antisocial behavior and psychosocial maturity from adolescence to young adulthood. *Dev Psychol* 2009 November; 45(6):1654–68. <http://dx.doi.org/10.1037/a0015862>.
- [19] Patterson GR, Reid JB, Dishion TJ. A social learning approach: antisocial boys. Castalia Pub. Co; 1992.
- [20] Kurdek LA, Fine MA, Sinclair RJ. School adjustment in sixth graders: parenting transitions, family climate, and peer norm effects. *Child Dev* 1995;66:430–45.
- [21] Astone NM, McLanahan SS. Family structure, parental practices and high school completion. *Am Sociol Rev* 1991;56(No. 3):309–20.
- [22] Hill NE, Craft SA. Parent-school involvement and school performance: mediated pathways among socioeconomically comparable African American and Euro-American families. *J Educ Psychol* 2003;96:74–83.
- [23] Topor DR, Keane SP, Shelton T, Calkins SD. Parent involvement and student academic performance: a multiple mediational analysis. *J Prev Interv Community* 2010;38(3):183–97. <http://dx.doi.org/10.1080/10852352.2010.486297>.
- [24] Hovee M, Dubas JS, Eichelsheim VI, van der Laan PH, Smeenk W, Gerris JRM. The relationship between parenting and delinquency: a meta-analysis. *J Abnorm Child Psychol* 2009;37:749–75.
- [25] de Kemp RAT, Scholte RHJ, Overbeek G, Engels RCME. Early adolescent delinquency: the role of parents and best friends. *Crim Justice Behav* 2006;33:488–510.
- [26] Dishion TJ, Kavanagh K. *Intervening in adolescent problem behavior: a family-centered approach*. New York: Guilford; 2003.
- [27] Dishion TJ, Patterson GR, Stoolmiller M, Skinner ML. Family school and behavioral antecedents to early adolescent involvement with antisocial peers. *Dev Psychol* 1991;27:172–80.
- [28] Dishion TJ, Patterson GR. *The development and ecology of antisocial behavior in children and adolescents*. In: Cicchetti D, Cohen DJ, editors. *Developmental psychopathology* vol. 3; 2006. p. 503–41. Risk, Disord Adapt. NY: Wiley.
- [29] Laird RD, Criss MM, Pettit GS, Dodge KA, Bates JE. Parents' monitoring knowledge attenuates the link between antisocial friends and adolescent delinquent behavior. *J Abnorm Child Psychol* 2008;36:299–310.
- [30] Dishion TJ, Spracklen KM, Andrews DM, Patterson GR. Deviancy training in male adolescent friendships. *Behav Ther* 1996;27:373–90.
- [31] Jeynes WH. A meta-analysis: the relationship between father involvement and student academic achievement. *Urban Educ* June 2015;50(4):387–423.
- [32] Michael D. Resnick, Peter S. Bearman, Robert Wm. Blum, Karl E. Bauman, Kathleen M. Harris, Jo Jones, et al. Protecting adolescents from harm. Findings from the national longitudinal study on adolescent health. *JAMA* 1997;278(10):823–32.
- [33] Nonnemaker J, McNeely C, Blum R. Public and private domains of religiosity and adolescent health risk behaviors: evidence from the National Longitudinal Study of Adolescent Health. *Soc Sci Med* 2003;57:2049–54.
- [34] Blum RW, McNeely C, Rinehart PM. *Improving the odds: the untapped power of schools to improve the health of teens*. Minneapolis: Center for Adolescent Health and Development, University of Minnesota; 2002.
- [35] Klem AM, Connell JP. Relationships matter: linking teacher support to student engagement and achievement. *J Sch Health* 2004;74(7):262–73.
- [36] Hawkins JD. Academic performance and school success: sources and consequences. In: Weissberg RP, Gullotta TP, Hampton RL, Ryan BA, Adams GR, editors. *Healthy Children 2010: Enhancing Children's Wellness* vol. 8; 1997. Issues in Children's and families' Lives. Thousand Oaks, CA: Sage.
- [37] Centers for Disease Control and Prevention. *School connectedness: strategies for increasing protective factors among youth*. Atlanta, GA: U.S. Department of Health and Human Services; 2009. Available at: <http://www.cdc.gov/healthyyouth/protective/pdf/connectedness.pdf> [accessed on 20.06.15].
- [38] Centers for Disease Control and Prevention. *The association between school-based physical Activity, including physical education, and academic performance*. Atlanta, GA: U.S. Department of Health and Human Services; 2010. Available at: http://www.cdc.gov/healthyyouth/health_and_academics/pdf/pa-pe_paper.pdf [accessed on 20.06.15].
- [39] McNeely CA, Nonnemaker JM, Blum RW. Promoting school connectedness: evidence from the National Longitudinal Study of Adolescent Health. *J Sch Health* 2002;72(4):136–46.
- [40] Wilson D. The interface of school climate and school connectedness and relationships with aggression and victimization. *J Sch Health* 2004;74(7):293–9.
- [41] Ackard DM, Neumark-Sztainer D, Story M, Perry C. Parent-child connectedness and behavioral and emotional health among adolescents. *Am J Prev Med* 2006 Jan;30(1):59–66.