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A Hong Kong school-based survey: impacts of parental gambling on adolescent gambling behavior and mental health status

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Abstract

A school-based survey was conducted to examine the impact of parental gambling on adolescent gambling behavior and mental health status. A self-administered standardized questionnaire was distributed to 1,095 high school students. The response rate was 84.5%. Almost half of the participants (46.5%) reported gambling in the past year. Using the DSM-IV-MR-J (*Journal of Gambling Studies* 16: 253-273, 2000), 3.3% ($n = 31$) of the participants could be identified as at-risk gamblers, and 0.9% ($n = 8$) could be classified as probable pathological gamblers. Only 16.7% of the participants ($n = 155$) disclosed having a parent who gambled excessively but the perceived harms in the family were alarming including disrupted family relationships, family financial difficulties and diminished need fulfillment. When compared with participants without parental gambling problems, adolescents with perceived parental gambling problems had significantly higher scores on the Depression, Anxiety and Stress Scales (DASS-21) (*Behavior Research and Therapy* 33: 335-345, 1995). The study results have implications for preventive initiatives, intervention strategies and future research.

Keywords: Parental gambling; Adolescent gambling; Youth mental health

Background

With the legalization of soccer betting in 2003 and rapid expansion of casino gambling in the nearby regions (e.g. Macau, Singapore and South Korea), the opportunities for Hong Kong citizens to gamble have increased considerably in the past decade. Previous government-commissioned prevalence surveys revealed that approximately 80% of Hong Kong residents aged between 15 and 64 years participated in gambling activities in the past year (University of Hong Kong 2005; Wong and So 2003). The age of legal gambling in Hong Kong is 18 years. Although more studies have been conducted to examine the gambling behavior of adults and adolescents (University of Hong Kong 2005; Wong 2010; Hong Kong Polytechnic University 2010), little research has been undertaken to examine the effects of parental gambling on children and adolescents. The present study attempts to fill this research gap by investigating the impact of parental gambling on adolescents' gambling participation and psychological well-being.

Previous research suggested that the effects of problem gambling of parents on the family are multifaceted and detrimental. There are robust findings that parental involvement in gambling is associated with an increase in the prevalence of gambling-related problems in

adolescence (Felsher et al. 2003; McComb and Sabiston 2010; Vitaro and Wanner 2011; Wickwire et al. 2007). Wickwire et al. (2007) found that teenagers with a parent who gambled were 2.8 times more likely to report at-risk or problem gambling.

Both genetics and a social learning paradigm have been proposed to elucidate the role of familial influences on adolescent gambling behavior. In the genetic paradigm, research shows that gambling problems tend to run in families (Black et al. 2006; Xian et al. 2007). (Slutske et al. 2001; 2009) reported that genetic factors account for approximately 50% of variance in the risk of gambling problems. There is also emerging scientific evidence indicated that neurotransmitters such as serotonin and noradrenalin are associated with pathological gambling (Potenza 2008; Grant et al. 2006).

In the social learning paradigm, researchers suggested that parental involvement in gambling has provided a social model to their children to follow. Parental positive attitude towards gambling, for instance, and their involvement in their children's gambling, often implies approval and conveys an implicit message that gambling is harmless. (Oei and Raylu 2004) showed that parental gambling cognition and behaviors affected their children's cognition and behaviors on gambling in both direct and indirect ways. However, it is unclear how the gambling problem of a specific family member (i.e. father or mother) might account for their children's gambling behavior. (Vachon et al. 2004) found that adolescent gambling problems were only linked to the severity of the father's gambling problems.

Apart from children's gambling behavior, researchers have also attempted to examine the psychosocial impact of parental gambling problems on children and family. Family support has been found to be associated with lower risk of adolescent deviant behaviors such as drug and alcohol addiction (Rutter 1995a). Similar theories have been found in the gambling literature. (Hardoon et al. 2004) found support for their hypothesis that youth who perceived their families as unsupportive are at increased risk of developing a gambling problem. In their study, they found that at-risk and probable pathological gamblers had significantly lower mean scores on the family support scale. However, some contradictory evidence revealed a positive correlation between family support and gambling behaviors. (Wickwire et al. 2007) found that family support displayed a positive relation to the gambling risk index among female adolescents. Given the uncertainty of the role of family support in the development of gambling behaviors, it is important to elucidate its role in our study.

The mental health status of children whose parents have gambling problems is also implicated in previous studies. Families with parental gambling problems are often subjected to experiencing distress from marital discord, arguments, divorce, financial problems, and physical problems such as abuse (Hogan 1997). Vitaro and his colleagues (Vitaro et al. 2008) showed that children of parents with gambling problems reported more depressive feelings and conduct problems from mid adolescence to early adulthood. They also experienced inconsistent parenting, difficulties in school progress, emotional deprivation, and increased family tension. Children of problem gamblers are also found to have inadequate stress management skills and poor interpersonal relationships (Jacobs et al. 1989). However, not all studies investigating the behavioral or mental health outcomes of problem gamblers' children provide support to the detrimental effects of parental problem gambling on children. For instance, Dowling, Smith and Thomas (Dowling et al. 2009) noted no elevated rates of psychological dysfunction in children of pathological gamblers, and children's behavioral problems could not be predicted by mother's gambling frequency (Momper and

Jackson 2007). The limited evidence available warrants our attention to the inconsistent findings.

There has been a paucity of research on the influence of parental gambling from children's and adolescents' perspective in Hong Kong. There has been a call for basic and applied research to examine the familial influence and the risk factors in relation to adolescent gambling problems. The main objectives of this research were to examine the factors that place adolescents with parental gambling problems at an increased risk of gambling or mental health problems. Specifically, the hypotheses of the current study include (a) adolescents with problem gambling parents would experience and report parental gambling-related harmful consequences, (b) adolescents' gambling problems are associated with perceived parental gambling problems; (c) adolescents with perceived parental gambling problems report receiving lower support from their family; and (d) adolescents with perceived parental gambling problem report higher levels of depression, anxiety and stress.

Methods

The survey was conducted from February to April 2012. Ethics approval was obtained from the research committee of the Hong Kong Federation of Youth Groups which received a grant to undertake this study. Eleven co-educational secondary schools agreed to participate in the study. Two to four classes of grade seven to grade eleven students were randomly selected from each of these eleven schools. A standardized questionnaire was distributed to 1,095 students. The aims and procedures of the study were fully explained before students' consent to participate was sought. Survey participation was voluntary and anonymous. A total of 926 questionnaires were completed and returned to the researchers, yielding a response rate of 84.5%.

Participants

All the participants ($n = 926$) were aged 12 to 20 years ($M = 14.73$, $SD = 1.68$). Almost half of the participants ($n = 448$, 48.5%) were aged between 15 and 17 years, 436 students (47.1%) were between 12 and 14 years, and 42 students (4.54%) were within the age bracket of 18 to 20 years. Slightly more than half were boys ($n = 471$, 50.9%), and 455 (49.1%) were girls. There were more junior graders (year 7–9) (60.6%) than senior students (year 10–11) (39.4%).

Measures

The participants were asked to complete a self-administered questionnaire which included the following sections:

1. Questions to collect socio-demographic information on gender, age, school grades, amount of pocket money, and parents' marital status;
2. Participants were asked if they had gambled during the previous 12 months and if so their choice of games. They were also asked if their parents and peers had gambling problems (e.g. Did your parent(s) gamble in the past 12 months? Do you think your parent(s) had gambling problems in the past year?), and if they had gambled with them in the preceding year.
3. Based on relevant past studies (e.g. Felsher et al. 2003; Jacobs et al. 1989; McComb and Sabiston 2010), the researchers designed a 14-item Perceived Consequences of

Parental Gambling Questionnaire (PCPGQ). The questionnaire has been tested to be reliable (Cronbach's alpha = 0.89) and valid. Construct validity of the questionnaire was examined by factor analysis (Harman 1967). A principal component analysis was performed on the item responses of the participants. Three factors with eigenvalues exceeding unity were yielded, explaining 59.2% of the total variance. The three-factor solution, which was considered as providing adequate representation of the data, was rotated to a Oblimin criterion to enhance the interpretability of the factors. Table 1 summarizes the Oblimin rotated factor structure of the questionnaire.

The first factor, labeled as disrupted family relationship, explained 41.4% of the total variance. This factor consists of question item 1, 2, 3, 4, 5, 6, 7 and 8. The second factor represents adolescents' perception of diminished need fulfillment due to parental gambling problem (10.2% of the total variance). This factor is composed of item 12, 13 and 14. The last factor reflects family financial difficulties, accounting for 7.6% of the total variance. The factor is made up of item 9, 10 and 11. All the items in these three factors had factor loadings exceeding 0.4 which is regarded as satisfactory when construct validity is examined (Overall and Klett 1972).

4. The Diagnostic and Statistical Manual (4th edition) Multiple Response format for Juveniles (DSM-IV-MR-J) (Fisher 2000) was employed to assess the severity of gambling problems among the adolescents. It is a reliable (Cronbach's alpha = 0.75) and valid gambling screen which was tested to be unidimensional (Fisher 2000). Endorsement of four or more of the nine categories of the criteria indicates pathological gambling, endorsement of two or three categories suggests at-risk

Table 1 A summary of oblimin rotated factor structure of the perceived consequences of parental gambling questionnaire (N = 155)

Factors and question items	Factor loadings
Factor 1: Disrupted family relationship	
(Eigenvalue = 5.8; Variance = 41.4%)	
2. Gambling affected your relationship with parents	0.85
4. Gambling parent(s) failed to fulfill his/her parental responsibilities	0.82
7. Felt insecure at home because of parental gambling problems	0.75
8. Gambling parent(s) could not be trusted with money issues	0.75
1. Gambling parent(s) spent less time at home	0.68
5. Gambling led to conflicts between parents	0.67
6. Gambling parent begged to be given a chance to change	0.66
3. Gambling parent(s) spent less time with you (e.g. talking, playing, family gatherings)	0.62
Factor 2: Diminished need fulfillment	
(Eigenvalue = 1.4; Variance = 10.2%)	
12. Parental gambling problem affects basic need (e.g. food and clothing)	0.77
14. Parental gambling affected learning at school	0.77
13. Parental gambling affected social activities	0.71
Factor 3: Family financial difficulties	
(Eigenvalue = 1.1; Variance = 7.6%)	
9. Annoyance/harassment due to gambling debts	0.78
11. The gambling parent(s) asked for money to pay debts	0.73
10. Financial problems at home because of gambling	0.53

gambling, and endorsement of zero or one category implies social or recreational gambling.

5. The 20-item Perceived Social Support-Family Inventory (PSS-FA) (Procidano and Heller 1983) assesses an individual's perception of social support received from his/her family. The inventory was verified to be a reliable (Cronbach's alpha = 0.9) and valid instrument (Procidano and Heller 1983). Responses to each item can be "yes", "no" or "do not know". Only the affirmative responses are scored (i.e., one score is to be given to each response of "yes").
6. The 21-item Depression, Anxiety, and Stress Scales (DASS-21) (Lovibond and Lovibond 1995) was used to measure the students' negative emotional states of anxiety, depression, and stress over the previous week. The 21 items are categorized into three 7-item sub-scales. A four-point response format was used (0 = did not apply to me, 1 = sometimes, 2 = a good part of time, 3 = most of the time). Each item score ranges from 0 to 3. Since the DASS-21 is a short version of the 42-item DASS (the Long Form), the final score of each item groups (Depression, Anxiety and Stress) needs to be multiplied by two to generate comparable scores with the long version. Higher the scores, the more severe the emotional distress is. The proposed clinical cutoffs for the depression, anxiety and stress sub-scales are 9, 7 and 14, respectively. The factor structure of the DASS-21 is stable, and the scale has good convergent and discriminant validity in both clinical and non-clinical samples (Lovibond and Lovibond 1995). The instrument was tested to be reliable with Cronbach's alphas ranging from 0.82 to 0.9 (Henry and Crawford 2005).

Statistical analysis

Statistical analysis of the collected quantitative data was conducted using the SPSS (version 18). Many were descriptive statistical tests (e.g. frequencies, means and cross-tabulations). The Chi-squares and t-tests were used to detect and compare differences between groups (e.g. sex and age differences, mean differences of psychosocial variables between adolescents with problematic gambling parents and those without). Pearson product moment tests were computed to identify the correlates of adolescent problem gambling. Results are noted significant at $p < 0.05$. Fortunately, missing data is not an issue because the participants answered all the essential survey questions.

Results

Gambling involvement in the past year

A total of 431 (46.5%) participants reported gambling in the previous 12 months. Although more boys ($n = 228$, 48.4%) gambled than girls did ($n = 203$, 44.6%) in the past year, no significant gender difference in gambling participation was found.

As shown in Table 2, the three most popular games chosen by these young gamblers were cards and mahjong (71.0%), video games (59.6%) and Mark Six lottery (29.9%). Gender differences were noted for video games, Internet gambling and soccer betting. More boys than girls bet on video games ($\chi^2(1) = 7.91$, $p < 0.05$), Internet gambling ($\chi^2(1) = 5.85$, $p < 0.05$), and soccer matches ($\chi^2(1) = 11.33$, $p < 0.05$).

Adolescent pathological gambling

As shown in Table 3, 0.9% of the entire sample ($n = 8$; 7 boys and 1 girl) could be classified as probable pathological gamblers, 3.3% ($n = 31$; 21 boys and 10 girls) could be categorized

Table 2 Forms of gambling by gender (N = 431)

	Total gamblers (n = 431)		Boys (n = 228)		Girls (n = 203)		χ^2	P
	N	%	n	%	n	%		
Gambling activities (in the past year)								
Social gambling (cards and mahjong)	306	71.0	156	36.2	150	34.8	0.01	0.93
Video games	257	59.6	150	34.8	107	24.8	7.91**	0.01
Mark Six lottery	129	29.9	68	15.8	61	14.2	0.23	0.63
Internet gambling	54	12.5	36	8.4	18	4.2	5.85*	0.02
Casino games	35	8.1	21	4.9	14	3.2	1.23	0.26
Soccer games	22	5.1	19	4.4	3	0.7	11.33**	0.01
Gambling on casino Cruises	19	4.4	9	2.1	10	2.3	0.10	0.76
Horse racing	17	3.9	9	2.1	8	1.8	0.03	0.86

* $p < 0.05$, ** $p < 0.01$.

as “at-risk” gamblers and 42.3% ($n = 392$; 200 boys and 192 girls) were social or recreational gamblers, using the DSM-IV-MR-Juvenile criteria (Fisher 2000). Chi-square tests were used to assess sex difference in gambling behavior. Significant gender difference was found in both at-risk and pathological gambling but not in gambling participation. Boys were more susceptible to at-risk gambling ($\chi^2 (1) = 3.84$, $p < 0.05$) and pathological gambling ($\chi^2 (1) = 4.43$, $p < 0.01$).

Gambling participation and problematic gambling among adolescents who reported parental excessive gambling

For the entire sample, 43.4% ($n = 402$) and 23.7% ($n = 219$) of the participants reported that either their father or mother had gambled in the preceding year respectively. Although altogether 67.1% ($n = 621$) noted at least one of their parents had gambled during the past year, only 16.7% ($n = 155$) disclosed parental problem gambling. Amongst those who reported having gambled, 20.2% reported that they had gambled with one of their parents, while 27% of the participants reported gambling with their friends in the past 12 months.

As shown in Table 4, the rate of past-year gambling participation was higher among the participants who reported parental problem gambling (52.9%) than those who made no such reports (45.3%). They were also more vulnerable to developing gambling problems. Among the 155 participants who reported parental problem gambling, two (1.3%) were probable pathological gamblers and eleven (7.1%) were at-risk gamblers. For the sample of adolescents ($n = 771$) whose parents were not perceived as having problem gambling, only 0.8% ($n = 6$) met the DSM-IV criteria for pathological gambling, and

Table 3 Prevalence of gambling participation and pathological gambling in the past year (N = 926)

Gambling behavior	Total sample (n = 926)		Boys (n = 471)		Girls (n = 455)		χ^2	Degree of freedom
	N	%	N	%	n	%		
Non-gamblers	495	53.5%	243	26.2%	252	27.2%	0.81	(1)
Social gamblers	392	42.3%	200	21.6%	192	20.7%	0.05	(1)
At-risk gamblers	31	3.3%	21	2.3%	10	1.1%	3.84*	(1)
Pathological gamblers	8	0.9%	7	0.8%	1	0.1%	4.43**	(1)

* $p < 0.05$, ** $p < 0.01$.

Table 4 Comparison of gambling behavior between participants with and without parental problem gambling (N = 926)

Respondents' gambling behavior	Parental problem gambling						X ²	Degree of freedom	p
	No		Yes		Total				
	n	%	n	%	n	%			
Non-gamblers	422	54.7%	73	47.1%	495	53.5%	3.41	(1)	0.06
Social gamblers	323	41.9%	69	44.5%	392	42.3%	0.47	(1)	0.05
At-risk gamblers	20	2.6%	11	7.1%	31	3.3%	3.36	(1)	0.07
Pathological gamblers	6	0.8%	2	1.3%	8	0.9%	0.15	(1)	0.70
Total no. of past-year gamblers (social, at-risk and pathological gamblers)	349	45.3%	82	52.9%	431	46.5%			
Total	771	100.0%	155	100.0%	926			100%	

2.6% ($n = 20$) could be designated as at-risk gamblers. In brief, youngsters who had reported parental excessive gambling were 1.6 times as likely as their counterparts to develop pathological gambling, and 2.7 times more likely to be at-risk gamblers themselves although such differences are not statistically significant when chi-square tests were computed.

Perceived negative consequences of parental gambling

Table 5 summarizes the perceived negative consequences of parental gambling among the participants ($n = 155$, 16.7%) who reported their parents having a gambling problem. The item endorsement of the Perceived Consequences of Parental Gambling Questionnaire is also given:

- 1) The factor of Disrupted Family Relationship (Cronbach's alpha = 0.87) consists of item 5: gambling led to conflicts between parents (item endorsement: 38.1%); item 2: damaged parent-child relationship (34.2%); item 3: the gambling parent spent

Table 5 Perceived negative consequences of parental gambling (N = 155)

Question Items	Yes	No
	n (%)	n (%)
<i>Factor 1: Disrupted family relationship</i>		
5. Gambling led to conflicts between parents	59 (38.1%)	94 (60.6%)
2. Gambling affected your relationship with parents	53 (34.2%)	101 (65.2%)
3. Gambling parent(s) spent less time with you (e.g. talking, playing, family gatherings)	51 (32.9%)	103 (66.5%)
1. Gambling parent(s) spent less time at home	47 (30.3%)	107 (69%)
4. Gambling parent(s) failed to fulfill his/her Parental responsibilities	45 (29%)	109 (70.3%)
8. Gambling parent(s) could not be trusted with money issues	40 (25.8%)	114 (73.5%)
7. Felt insecure at home because of parental gambling problems	37 (23.9%)	117 (75.5%)
6. Gambling parent begged to be given a chance to change	31 (20%)	123 (79.4%)
<i>Factor 2: Diminished need fulfillment</i>		
14. Parental gambling affected learning at school	22 (14.2%)	132 (85.2%)
13. Parental gambling affected social activities	17 (11%)	137 (88.4%)
12. Parental gambling problem affects basic need (such as food and clothing)	11 (7.1%)	143 (92.3%)
<i>Factor 3: Family financial difficulties</i>		
10. Financial problems at home because of gambling	36 (23.2%)	118 (76.1%)
11. The gambling parent(s) asked for money to pay debts	14 (9.0%)	139 (89.7%)
9. Annoyance/harassment due to gambling debts	6 (3.9%)	147 (94.8%)

little time with me (e.g. talking, playing, family gatherings) (32.9%); item 1: the gambling parent spent little time at home (30.3%); item 4: the gambling parent failed to fulfill his/her parental responsibilities (29%); item 8: the gambling parent cannot be trusted with in money issues (25.8%); item 7: feeling insecure at home because of parental gambling problems (23.9%), and item 6: the gambling parent begged for a chance to change (20%).

- 2) The second factor of Diminished Need Fulfillment (Cronbach's alpha = 0.67) is composed of item 14: parental gambling affected learning at school (14.2%); item 13: parental gambling restricted affordability to join social activities (11%), and item 12: parental gambling affected basic need fulfillment (e.g. insufficient food and clothing) (7.1%); and
- 3) The last factor could be labeled as Family Financial Difficulties (Cronbach's alpha = 0.64). This factor includes item 10: family financial problems (23.2%), item 11: the gambling parent asked for money to repay gambling debts (9%), and item 9: harassment from loan sharks/creditors due to gambling debts (3.9%).

Perceived family support and mental health status of children with parental problem problems

T-tests were performed to compare the difference of means in perceived family support and DASS scores between the group of adolescents who reported having parental problem gambling ($n = 155$) and the group without parental problem gambling ($n = 771$). As shown in Table 6, participants whose parent(s) had problem gambling reported receiving lower perceived family support than their counterparts ($t = -4.03, p < 0.001$). They also experienced higher levels of stress ($t = 5.06, p < 0.001$), anxiety ($t = 5.18, p < 0.001$), and depression ($t = 3.91, p < 0.001$). For adolescents who reported parental gambling problems, the mean score for DASS-Anxiety is 9.57 (SD = 7.32), the mean score for DASS-Depression is 10.08 (SD = 8.91), and the mean score for DASS-Stress is 13.13 (SD = 9.06).

Parental and mental health correlates of adolescent problem gambling

Pearson product moment tests were computed (Table 7) to verify if adolescent gambling problems were associated with parents' gambling behavior, perceived family support and mental health status. The correlation findings indicate that the severity of adolescent gambling problems (reflected by the DSM-IV-MR-J scores) was significantly correlated with the male gender ($r = -0.15, p < 0.01$), father's gambling involvement in the

Table 6 Comparing mean differences of psychosocial variables between adolescents with problematic gambling parents and those without

	Adolescents with problematic gambling parents ($n = 155$)	Adolescents without problematic gambling parents ($n = 771$)	<i>t</i>
	Mean (SD)	Mean (SD)	
Perceived family support	8.08 (5.53)	10.11 (5.76)	***-4.03
DASS- Stress	13.13 (9.06)	8.95 (9.36)	***5.06
DASS- Depression	10.08 (8.91)	6.99 (8.84)	***3.91
DASS-Anxiety	9.57 (7.32)	6.21 (7.32)	***5.18

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 7 Pearson correlations among various psychosocial variables and DSM-IV-MR-J scores

Variables	DSM-IV-MR-J scores	P
Gender	-0.15**	.002
Father's gambling involvement	0.11**	.001
Mother's gambling involvement	0.15***	.000
Mother's problematic gambling	0.13***	.000
Gambling with mother in the past year	0.15***	.000
Gambling with father in the past year	0.16***	.000
Perceived family support scores	-0.09**	.009
DASS-Stress scores	0.12***	.000
DASS-Anxiety scores	0.14***	.000
DASS-Depression scores	0.13***	.000

* $p < .05$, ** $p < .01$, *** $p < 0.001$ (two-tailed tests).

past year ($r = 0.11$, $p < 0.001$), mother's gambling participation in the past year ($r = 0.15$, $p < 0.01$), mother's problematic gambling ($r = 0.13$, $p < 0.001$), gambling with mother in the past year ($r = 0.15$, $p < 0.001$), gambling with father in the past year ($r = 0.16$, $p < 0.001$), low perceived family support ($r = -0.09$, $p < 0.01$), high DASS-Stress scores ($r = 0.12$, $p < 0.001$), high DASS-Anxiety scores ($r = 0.14$, $p < 0.001$), and high DASS-Depression scores ($r = 0.13$, $p < 0.001$). Although these correlations are not strong, they provide support for association between adolescent gambling problems and a host of parental gambling and mental health variables. Future studies need to further explore these risk factors of adolescent problematic gambling.

Discussion

Significance of this study

The study attempts to fill a research gap by investigating an important but under-examined research area. That is the effects of parental gambling problems on adolescents. This school-based survey increases our understanding of children's experiences and perceptions of the harmful effects of parental excessive gambling on themselves and on the family. Replicating previous studies (Langhinrichsen-Rohling et al., 2004; Vachon et al. 2004; Winters et al. 2002; Wong 2010), the descriptive and correlational results of this survey confirm that adolescents who reported parental excessive gambling were more likely to develop gambling problems. They were also more susceptible to psychiatric impairment (e.g. anxiety, depression and stress) and experienced low levels of perceived family support. Many of them were distressed by damaged family relationships, family financial difficulties and diminished need fulfillment due to parental gambling problems.

Comparison with previous studies

The findings on adolescent gambling are comparable to earlier studies in non-Chinese culture. First, problematic gambling is more prevalent among male adolescents (Blinn-Pike et al. 2010; Splevins et al. 2010); Jackson et al. 2008). Several studies on parental gambling reveal a modest association between parental gambling and adolescent gambling (Wickwire et al. 2007; Vachon et al. 2004; Winters et al. 2002). For example, the correlation between parental gambling and adolescent gambling was 0.28 in (Vitaro et al. 2008). This survey has also noted a weak but significant association for further investigation in

future research. Some researchers suggest that the effect of parental problem gambling on children mirrors the detrimental impact of parental drug or alcohol dependency, where children suffer from difficulties in school, lack of parental interest and involvement, and increased family tension (Darbyshire et al. 2001). In our study the subjective reports of mental health status and perceived family support of adolescents who were distressed with parental gambling problems provide support to this hypothesis. Past research also indicates family support and sound adolescent mental health could mediate or buffer the negative impact of parental excessive gambling on adolescent gambling behavior (e.g. Dowling et al. 2010).

Compared with a recent local survey result derived also from juvenile gamblers (22.9%) (Wong, 2010), this study noted a slightly lower proportion (16.7%) of parental gambling problems. In brief, the descriptive and correlation findings of this study are consistent with previous local and western research results, documenting the effects of parental gambling problems on children's risk for having a gambling addiction.

Limitations of this study

The study has several limitations. First, parental problem gambling is a hidden disorder which can be sustained and unnoticed by children for a long period of time. Hence, the survey participants might have missed the signs of parents' gambling problem and under-reported the cases. In short, this study only provides estimation (16.7%) of parental gambling problem perceived by adolescents. We could not verify how accurate such estimation is. Second, this is a cross sectional study which fails to provide causal explanation of parents' gambling problem and adolescents' excessive gambling. Only correlates of adolescent problematic gambling have been identified. We need more research to confirm if a causal relationship exists between parents' and children's gambling problem. Third, there is no standardized definition of parental gambling problems. As a result, it is not easy to make comparison of research results across different jurisdictions as cultural differences might exist.

Conclusion

The young problematic gamblers need professional help to cope with family, school and mental health problems. Unfortunately, children of problem gamblers are rarely included in the treatment process in Hong Kong. Gambling counseling and intervention often focus primarily on the problem gambler and the spouse. Help and treatment services should be extended to include gamblers' children. Counselors should motivate gamblers and their spouses or partners to encourage their children to seek professional help.

The study results also indicate the need for improving parent education and children's awareness. It would be useful to promote awareness of the potential harm of parental excessive gambling on children and the whole family in public health programs and parent education initiatives. School-based secondary prevention programs could be organized for at-risk adolescents whose parents gamble excessively. Of course, adolescent problematic gamblers who do not come from a gambling family also need timely professional help. Lastly, more child and family research is needed to inform preventive and treatment services. We hope that the gambling operators and the government will provide funds for such gambling research, and both preventive and intervention programs.

Competing interests

The authors declare that they have no competing interests.

Authors' contributions

SMH and LMCL conducted the school-based survey, and analyzed the findings. ILKW and LMCL designed the survey questionnaire. All the authors participated in paper writing and revision. All authors read and approved the final manuscript.

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