

Association of Problematic Smartphone Use With Perceived Family Well-Being in Chinese Adult: The Family Project

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Introduction

Problematic smartphone use (PSU) is a rapidly growing yet underrecognized public health challenge. Emerging research has suggested PSU as a psychopathological disorder resembling behavioural addiction. Many studies have found PSU associated with anxiety and depression [1]. Very little is known about the impact of PSU on family functioning or quality of family relationship, which influence individual and family health.

Family well-being encompassing family harmony, happiness and health (3H's) has remained a core societal value in Chinese in Hong Kong [2, 3], the most westernized and economically developed city of China. Hong Kong's smartphone penetration (85.8 % in 2016) is pervasive and among the highest in the world. This study aimed to examine the association of PSU with perceived family well-being in a large, population-representative sample of Chinese adults in Hong Kong.

Methods

We used data from the Hong Kong Family and Health Information Trend Survey (FHInTS), a regular population-based telephone survey under the project "FAMILY: a Jockey Club initiative for a Harmonious Society" (<https://www.family.org.hk/en>). Cantonese-speaking Hong Kong residents aged 18 years or above years were randomly selected through two-stage probability-based sampling procedures by a reputable survey agency. Trained interviewers conducted the interview using a web-based computer assisted telephone interviewing system.

The exposure measure was the Smartphone Addiction Scale-short version (SAS-SV) [4], which was translated into Chinese [5]. The SAS-SV contains 10 negatively worded items, each scored on a Likert scale from 1 (strongly disagree) to 6 (strongly agree). The sum of the 10 items gives a total SAS-SV score (10 to 60) with a higher score indicating more PSU. Cut-offs of ≥ 31 for males and ≥ 33 for females define high risk of PSU [4]. The outcome was measured by a brief, 3-item perceived family well-being scale. Subjects rated "Do you think your family is (1) harmonious, (2) happy and (3) healthy?" each on a scale of 0 to 10. Their sum gives a composite score (0 to 30) with higher scores indicating favourable family well-being. This measure correlated well with other indicators of family functioning with good internal consistency and test-retest reliability [6]. Potential confounders including gender, age, marital status, education level and monthly household income were also included.

All data were weighted by age, gender and education level distributions of the Hong Kong general population. We used multivariable linear regression to calculate the regression coefficients (b) of perceived family well-being score in relation to SAS-SV score (10 to 60) adjusting for all potential confounders. As a sensitivity test, we repeated the regressions with SAS-SV score replaced by having a high risk of PSU (yes/ no) as the exposure variable.

Results

After excluding 48 subjects with any missing data in SAS-SV and family well-being score, a weighted sample of 3195 respondents (mean age [SD] = 43.2 [15.6] year) were included. Over half of the respondents were female (54.8%), married (61.6%), had secondary education (52.6%) and monthly household income of HK\$20000 or above (71.3%).

The mean (SD) family well-being score was 22.1 (4.6). Nearly one third of the respondents had high risk of PSU (30.5%; 95% confidence interval [CI] 29.1% to 32.0%). Family well-being score was significantly lower in respondents with high risk of PSU (21.7 vs 22.3; $P < 0.001$).

Higher family well-being score was independently associated with female gender, older age, marital status and higher household income (Table). Both univariable and multivariable analyses showed that greater SAS-SV score was associated with lower perceived family well-being ($b = -0.038$; 95% CI -0.055 to -0.022). The sensitivity test also showed that having high risk of PSU was associated with poor perceived family well-being ($b = -0.59$; 95% CI -0.93 to -0.25) after adjusting for potential confounders.

Table. Associations of problematic smartphone use and other factors with perceived family well-being.

	Family well-being (SD)	Crude b (95% CI)	Adjusted b (95% CI) ^b
SAS-SV score (10-60)	-	-0.037 (-0.052, -0.021)***	-0.038 (-0.055, -0.022)***
Gender			
Male	21.8 (4.5)	0	0
Female	22.4 (4.7)	0.65 (0.33, 0.97)***	0.67 (-0.33, 1.01)***
Age, year			
18-24	21.3 (3.6)	0	0
25-44	22.2 (4.3)	0.95 (0.42, 1.49)***	0.31 (-0.30, 0.92)
45-64	22.0 (4.8)	0.73 (0.19, 1.28)**	-0.058 (-0.76, 0.65)
65+	23.1 (5.1)	1.85 (1.12, 2.57)***	1.59 (0.66, 2.52)**
Marital status			
Married/ Cohabitated	22.6 (4.5)	0	0
Unmarried	21.3 (4.5)	-1.32 (-1.66, -0.98)***	-1.31 (-1.76, -0.85)***
Divorced/ separated	19.9 (6.2)	-2.72 (-3.73, -1.70)***	-1.66 (-2.72, -0.60)**
Widowed	22.3 (5.0)	0.36 (-1.28, 0.55)	-0.15 (-1.16, 0.85)
Highest education level			
Primary or below	22.0 (5.4)	0	0
Secondary	22.0 (4.6)	-0.021 (-0.52, 0.48)	0.49 (-0.080, 1.05)
Tertiary or above	22.3 (4.3)	0.28 (-0.24, 0.81)	0.58 (-0.077, 1.25)
Monthly household income (HK\$)^a			
< \$9999	21.0 (5.5)	0	0

\$10000-19999	21.2 (4.8)	0.18 (-0.48, 0.83)	0.50 (-0.17, 1.17)
\$20000-29999	22.1 (4.7)	1.11 (0.48, 1.74)**	1.36 (0.71, 2.01)***
\$30000-39999	22.0 (4.4)	1.02 (0.34, 1.71)**	1.29 (0.58, 2.00)***
≥ \$40000	23.0 (4.0)	2.00 (1.39, 2.60)***	2.19 (1.53, 2.85)***

All data were weighted by age, sex and education level of the Hong Kong general population

^aHK\$7.8 ≈ US\$1

^bAdjusted for other variables in the table

* $P < 0.05$; ** $P < 0.01$; *** $P < 0.001$

Discussion and conclusions

This study was the first to find that PSU was associated with poor perceived family well-being in Chinese adults in the general population. The results remained robust after controlling for sociodemographic factors and were corroborated by a sensitivity analysis. Strengths of the study included the use of a large and population-representative sample of adults. Limitations included the cross-sectional design, and uncertain applicability of the findings in other populations with a different family culture (e.g. Caucasians). Further studies on other factors and adverse health and other effects of PSU on individuals and families are warranted.

Title:

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Keywords:

family, population study and smartphone addiction

References:

1. Elhai JD, Dvorak RD, Levine JC, Hall BJ. Problematic smartphone use: A conceptual overview and systematic review of relations with anxiety and depression psychopathology. *J Affect Disord.* 2017;207:251-9
2. Chan SS, Viswanath K, Au DW, Ma C, Lam W, Fielding R, et al. Hong Kong Chinese community leaders' perspectives on family health, happiness and harmony: a qualitative study. *Health Educ Res.* 2011;26(4):664-74.
3. Lam W, Fielding R, McDowell I, Johnston J, Chan S, Leung G, et al. Perspectives on family health, happiness and harmony (3H) among Hong Kong Chinese people: a qualitative study. *Health Educ Res.* 2012;27(5):767-79.
4. Kwon M, Kim DJ, Cho H, Yang S. The smartphone addiction scale: development and validation of a short version for adolescents. *PloS O* 2013;8(12):e83558.
5. Luk TT, Wang MP, Shen C, Wan A, Chau PH, Viswanath K, Chan SSC, Lam TH. The Chinese adaptation of Smartphone Addiction Scale-Short version in Hong Kong adults: a population study *JMIR Preprints.* 24/12/2017:9730 DOI: [2196/preprints.9730](https://doi.org/10.2196/preprints.9730)
6. Wang X, Wang MP, Viswanath K, Wan A, Lam TH, & Chan SS. Smoking and secondhand smoke exposure at home were associated with poor perceived family well-being: findings of family project. *PloS One.* 2016;11(8):

Abstract Summary:

Problematic smartphone use is an emerging but underrecognized public health issue. Little is known about its impact on family functioning and relationship, which affect individual health. This study found problematic smartphone use was associated with poor perceived family well-being in a large, population-representative sample of Chinese adults in Hong Kong.

Content Outline:

Learner objectives:

(1) The learner will be able to describe the research gap in problematic smartphone use in relation to family functioning and relationship.

(2) The learner will be able to describe the association of problematic smartphone use with perceived family well-being in Chinese adults in Hong Kong.

Outline of poster:

1. Introduction
 1. Background of problematic smartphone use (PSU)
 2. Literature gap
 3. Study objective
2. Methods
 1. Study design
 2. Main measures
 1. Smartphone Addiction Scale-short version
 2. Perceived family well-being scale
 3. Potential confounders
 3. Data analysis
3. Results
 1. Characteristics of the sample
 2. PSU and family well-being
4. Discussion
 1. Principle findings
 2. Strengths and limitations

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