Title: Test-retest reliability and validity of a single-item Self-reported Family Happiness Scale in Hong Kong Chinese: Findings from Hong Kong Jockey Club FAMILY Project

Chen Shen[1,2], PhD; Man Ping Wang[3*], PhD; Henry CY Ho[4], PhD; Alice Wan[2], MSc; Sunita M Stewart[5], PhD; Kasisomayajula Viswanath[6,7], PhD; Sophia Siu Chee Chan[3], PhD; Tai Hing Lam[2], MD

[1] Department of Epidemiology and Biostatistics, School of Public Health, Imperial College London, London, UK
[2] School of Public Health, The University of Hong Kong, Hong Kong
[3] School of Nursing, The University of Hong Kong, Hong Kong
[4] Department of Psychology, The Education University of Hong Kong
[5] Department of Psychiatry, The University of Texas Southwestern Medical Center at Dallas, Dallas, TX, USA;
[6] Center for Community-Based Research, Dana-Farber Cancer Institute, Boston, MA, United States
[7] Department of Social and Behavioural Sciences, Harvard TH Chan School of Public Health, Cambridge, MA, United States

*Corresponding author
Dr. Man Ping WANG, PhD
School of Nursing,
The University of Hong Kong,
21 Sassoon Road, Pokfulam,
Hong Kong SAR, China
Tel: (852) 3917 6636
Fax: (852) 2872 6079
Email: mpwang@hku.hk

Ethical statements
Ethical approval was granted by the Institutional Review Board of the University of Hong Kong / Hospital Authority Hong Kong West Cluster. For Study 1, verbal informed consents were obtained from the respondents. For Study 2, written consent was obtained from each participant prior to participation in the programs. For children enrolled in the study, written consent was obtained from their next of kin, caretakers, or guardians on their behalf.

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Abstract

Purpose: Family happiness is one major theme of family well-being in Chinese culture. We investigated the reliability and validity of the single-item Self-reported Family Happiness Scale (SFHS-1) with the score of 0 to 10, based on two studies in Hong Kong Chinese.

Methods: Study 1 was a territory-wide population-based telephone survey (n=4038) in 2016. Study 2 was a community-based family intervention program in 2012-2013 (n=1261) to enhance family communication and well-being. Test-retest reliability of the SFHS-1 was assessed over one month in study 2. Family APGAR (Adaption, Partnership, Growth, Affection, Resolve) Scale, Family Communication Scale, Subjective Happiness Scale, 12-item Short Form Health Survey Version 2, and 2-item Patient Health Questionnaire were used to assess the convergent and discriminant validity of the SFHS-1 in both studies. Multiple regression analysis was used to assess the incremental validity by identifying the additional contribution of the SFHS-1 score in predicting subjective happiness.

Results: The one-month test-retest reliability assessed by intra-class correlation was 0.76. Family happiness was moderately to strongly correlated with family function, family communication, subjective happiness, mental health-related quality of life and depression, but weakly correlated with physical health-related quality of life. Furthermore, the score of the SFHS-1 added predictive power to mental health-related quality of life and depression in assessing subjective happiness.

Conclusions: Our results have shown the SFHS-1 as a reliable and valid measurement of family happiness in Hong Kong Chinese, suggesting SFHS-1 is highly practicable for future large epidemiological and community-based intervention studies.

Keywords: family happiness; single-item scale; reliability; validity; quality of life

Introduction

Happiness is a global measure of subjective well-being and regarded as a fundamental public health goal. As people live longer and healthier, the expectations of health care have been extended to enhanced well-being and quality of life [1]. Socioeconomic position [2], healthy behaviors [3,4] and life events [5] are documented factors related to happiness. In the West where individualism is emphasized, happiness is regarded as more pleasure and less pain (Hedonic perspective) [6] or as vitality, activation, and self-actualization (Eudaimonic perspective) [1]. Individual happiness can be measured using the 4-item Subjective Happiness Scale [7] and the single-item Global Happiness Index [2]. These two scales, developed in Western populations, have also been validated in Chinese population [8,9]. However, Chinese philosophy emphasizes that individual happiness cannot be achieved without the happiness of others such as family members [10].

Hong Kong is the most developed and westernized city of China with 93.6% of the population being Chinese, and the local Chinese culture is much influenced by collectivism and Confucius ideals, and then by western values more recently. Family relationships are much valued in Chinese culture. Family goals are maintained by ensuring family cohesion, harmony, family dependence, and parental teachings [11,12]. Therefore, family happiness is especially important for the Chinese collectivistic culture. Two independent qualitative studies conducted by FAMILY Project team (FAMILY: a Jockey Club Initiative for a Harmonious Society) focusing on the general Chinese population and community leaders respectively in Hong Kong have found that family happiness is one of the major themes (family health, happiness and harmony (3Hs)) of family well-being [13,14]. The components of family happiness include feelings of security and togetherness, mutual care and support among family members, and a sense of self-contentment [13]. However, measuring each of these components is very difficult and may create a great operational burden on respondents. Long questionnaires are difficult for those with limited education to complete, and may also introduce high attrition rate [15] and refusal to participate [16]. Scales measuring broad family functions such as the Chinese Family Assessment Instrument [17] and Family Environment Scale [18] do not specifically measure family happiness. As there is a gap in the literature, we have developed a simple single-item Self-reported Family Happiness Scale (SFHS-1), with scores from 0 to 10, to measure family happiness.

Family happiness can be enhanced by spending time with family members and building connection with friends and relatives [14]. Our previous community-based family intervention programs to promote positive family communication have shown remarkable effectiveness on improving family happiness [19-21], indicating the responsiveness of the SFHS-1, which is the ability of a measurement to detect change over time attributable to the intervention [22]. These programs were developed with cooking,

dining and learning as the platforms to facilitate positive communication and interaction among family members.

Here we took advantage of a large-scale population-based telephone survey to examine whether the SFHS-1 had adequate construct validity (convergent and discriminant validity), incremental validity and known-groups validity in the general population. We also examined whether the SFHS-1 had adequate test-retest reliability and construct validity in a community setting based on a large-scale community-based family intervention program.

Methods

Source of data

We included two studies to comprehensively assess the test-retest reliability and validity of the SFHS-1. These two studies were conducted in population-based and community-based samples, derived from the same population.

Study 1: The Hong Kong Family and Health Information Trends Survey (FHInTS)

FHInTS was a regular periodic probability-based telephone survey of the general Hong Kong public designed to assess the opinions and behaviors on family health, information use and health communication. To date, five waves of FHInTS had been conducted and details were reported elsewhere [23,24]. The current wave was conducted from January to August 2016. The purpose was to collect data on the use of information and communication technologies for family and health information, and related patterns of family communication, family well-being, health behaviors and health status.

All interviews were conducted by the trained interviewers of the Public Opinion Program, The University of Hong Kong. The survey targeted the Cantonese-speaking adult population aged 18 years or over. Landline telephone numbers were randomly generated using known prefixes assigned to telecommunication services providers under the Numbering Plan provided by the Government Office of the Communications Authority. When contact was successfully established with a target household, one person qualified was selected from all those present using the "next birthday" rule [25]. The person from the household who had the nearest next birthday in all household members who were aged 18+ years was selected as the respondent. Verbal informed consents were obtained from the respondents. Construct validity, known-group validity and incremental validity of the SFHS-1 were assessed in study 1.

Study 2: Happy Family Kitchen II

Happy Family Kitchen II was a large-scale community-based family intervention program, implemented in Tsuen Wan and Kwai Tsing Districts in Hong Kong during February 2012 to August 2013 by collaboration between The Hong Kong Council of Social Service and School of Public Health of The University of Hong Kong. This program was based on a positive psychology framework, using cooking and dining with family members as the platform to promote positive family communication and family well-being.

A total of 23 social service units and 8 schools organized and conducted the programs. These social service units and schools were treated as clusters in a cluster randomized controlled trial, such that the participants were randomly allocated into 3 groups. Group A received a core session of at least 2 hours,

followed by a booster session of at least 1 hour one month later; Group B also received a core session of at least 2 hours followed by a tea gathering session one month later (no booster session); Group C, the control arm (waitlist control), had a tea gathering session at the beginning and at 1 month later. The core session involved group activities and homework assignments focusing on a positive psychology theme while the booster session focused on consolidating the knowledge and skills obtained from the core session. Tea gathering session covered topics unrelated to the intervention, such as arts and crafts workshops. Details of the Happy Family Kitchen II were reported elsewhere [20].

Outcomes were assessed at baseline, immediately after the intervention, 1 month, and 3 months after the intervention. This study was registered under ClinicalTrials.gov (NCT01796275). Ethical approval of the above two studies was granted by the Institutional Review Board of the University of Hong Kong / Hospital Authority Hong Kong West Cluster. Test-retest reliability and construct validity of the SFHS-1 were assessed in study 2.

Measurements

We defined family as "family members who are related through biological, marital, cohabitation, and/or emotional bonding", and such definition was explained to the respondents before asking questions about family 3Hs. Family happiness was measured by asking the respondents "how happy do you think your family is?" and asked them to rate using a scale of 0 to 10, where 0 means "not happy at all", 10 means "very happy", 5 means "half-half". The rest of scores are not labelled to minimize non-response [26] and avoid detracting from the interval nature of the scale [27].

Family harmony and health were also measured by another 2 questions with the scores ranging from 0-10, with higher scores indicating better family harmony and health. The Family APGAR (Adaption, Partnership, Growth, Affection, Resolve) Scale has 5 items to assess general family function [28]. Each item scores from 0 to 2, representing "seldom happens", "sometimes happens", and "often happens", respectively. Responses to these 5 items are summed to derive a score of 0 to 10, with a higher score indicating better family function. The Cronbach's α [29] was 0.86 in study 1. The Family Communication Scale (FCS) has 10 items to assess the most important aspects of communication in a family system [30]. Each item scores from 1 to 5, representing "strongly disagree", "disagree", "neutral", "agree", and "strongly agree", respectively. Responses to these 10 items are summed and divided by 10 to derive a score of 1 to 5, with a higher score indicating more positive family communication. The Cronbach's α ranged from 0.91 to 0.93 in study 2.

The Subjective Happiness Scale (SHS) is a 4-item scale to assess individual happiness [7]. Each item scores from 1 to 7 (e.g., 1 = "less happy", 7 = "more happy"). Responses to these 4 items are summed

and divided by 4 to derive a score of 1 to 7, with a higher score indicating higher happiness level. The Cronbach's α ranged from 0.69 to 0.74 in two studies. The 12-item Short Form Health Survey Version 2 (SF-12) is used to measure physical and mental health-related quality of life (HRQoL) and the raw scores are transformed into the physical component subscale (PCS) and mental component subscale (MCS) [31]. The instrument has 8 domains including Physical Functioning, Role Physical, Bodily Pain, General Health, Vitality, Social Functioning, Role Emotional, and Mental Health. The scores for each domain are calculated and standardized to a 0 to 100 scale. Scores of PCS and MCS, each ranging from 0 to 100, are calculated from 8 domains by applying scoring algorithms with weighted item responses, with higher scores indicating better perceived HRQoL. The Cronbach's α ranged from 0.72 to 0.80 for PCS and 0.73 to 0.82 for MCS in two studies. The 2-item Patient Health Questionnaire (PHQ-2) is used as a screening tool for depression [32]. Each item scores from 0 to 3, representing "never", "less than 7 days", "7 days or more", and "nearly daily", respectively. Responses to these 2 items are summed to derive a score of 0 to 6. The score of $\geq$3 has been recommended to identify cases positive for depression. In our sample, the standard coefficient α, which is more appropriate to assess the reliability of a two-item scale [33], was 0.72.

All the above scales have been validated in the Hong Kong Chinese population [8,34-36], with good internal consistency in our samples. In study 1, The Family APGAR, SHS, SF-12 and PHQ-2 were used to validate the SFHS-1. In study 2, FCS, SHS and SF-12 were used to validate the SFHS-1.

Demographic characteristics of the respondents were measured by education level (primary or below, secondary, and tertiary or above), employment status (unemployment, in paid employment, retired, housekeeper, and full-time student), and monthly household income (<HK $20,000, HK $20,000-29,999, HK $30,000-39,999, and HK $ 40,000+) (US $1=HK $7.8).

Statistical analysis

In study 1, the raw data were weighted by age, sex and educational attainment to improve the representativeness of the findings. The weighting was according to provisional figures obtained from the Census and Statistics Department on the sex-age distribution of Hong Kong population at the end of 2015 and the educational attainment (highest level attended) distribution in the 2011 census.

The correlations of the family happiness score with scores of the family harmony, family health, Family APGAR, SHS, SF-12 PCS and MCS, and PHQ-2 were addressed to determine convergent and discriminant validity. The Spearman correlation coefficient (r_s) was computed for the PHQ-2 score as it was not normally distributed, whilst other correlations were computed by Pearson correlation coefficients (r). To assess the incremental validity, we examined the additional contribution of the

SFHS-1 score in the assessment of subjective happiness by conducting a multiple regression analysis that included two individual measures of emotional functioning (the MCS and PHQ-2). To assess the known-groups validity, we compared the mean scores of the SFHS-1 by different socio-demographic characteristics in the general population.

In study 2, data analysis was conducted by intention-to-treat, adopting a full maximum likelihood inference with the assumption that data were missing at random. One-month test-retest reliability was assessed by intra-class correlation value of the SFHS-1 in the control group: poor=0-0.4, acceptable=0.4-0.75, and good =0.75-1.0. Partial correlation analysis was used to assess the correlations of the family happiness score with scores of the family harmony, family health, FCS, SHS, SF-12 PCS and MCS after accounting for the intervention effect. Differences in correlation coefficients were assessed using Fisher's z transformation test.

We hypothesized that family happiness would be positively correlated with family function, family communication, subjective happiness, mental and physical HRQoL ($r>0$), and negatively correlated with depression ($r_s<0$) (convergent validity). We hypothesized that the correlation of family happiness with physical HRQoL would be weaker than that with mental HRQoL (discriminant validity). We hypothesized that the SFHS-1 score would contribute additionally in the prediction of subjective happiness (incremental validity). We hypothesized that women, older respondents and those with higher household income had a higher level of family happiness (known-groups validity). All analyses were conducted using STATA 13.0 (StataCorp LP, College Station, TX, USA).

Results

Results from study 1

Of 5429 eligible adults, 4038 were successfully interviewed with a response rate of 74.4%. Table 1 shows that of 4038 respondents after weighting, 54.9% were women, 72.3% were aged 25 to 64 years, and 63.2% were married or cohabitating. Most respondents (76.4%) had secondary or higher education and 41.0% had monthly household income of HK$ 30,000 or higher (median monthly household income in Hong Kong was HK$ 25,000 in 2016).

Family happiness was significantly correlated with family harmony (r=0.79), family health (r=0.67), family function (r =0.41), subjective happiness (r=0.52), mental HRQoL (r=0.40) and depression (r_s =-0.28) in expected directions (Table 2). The correlation of family happiness with physical HRQoL (r=0.17) was significantly weaker than that with mental HRQoL (Fisher's transformation test, z=5.63) (All P values above < 0.001). The correlations were consistent across sex, age and education level.

The MCS and the PHQ-2 together explained 26.1% of the variance in the SHS. When the score of the SFHS-1 was added in the regression equation, the variance explained increased to 38.9% significantly ($\Delta F=204.5$, $P<0.001$). Thus the score of the SFHS-1 contributed additionally to the prediction of the individual subjective happiness (standardized beta coefficient for family happiness = 0.39, P<0.001).

The mean score of the SFHS-1 in the general population in Hong Kong was 7.47 (95% CI 7.41, 7.53) (Table 3). Women had a higher family happiness level than men (mean SFHS-1 score 7.52 versus 7.41, P<0.001). Married respondents had a higher family happiness level than single respondents (mean SFHS-1 score 7.68 versus 7.06, P<0.001). Unemployed respondents had a lower family happiness level than employed respondents (mean SFHS-1 score 6.37 versus 7.50, P<0.001). Respondents with one or more family members living together had a higher family happiness level than those living alone (P values < 0.05).

Results from study 2

A total of 2070 participants from 973 families participated in the Happy Family Kitchen II. After excluding 809 children (aged 6 to 11) and those who declined to be assessed, 1261 valid questionnaires (Group A: n=419; Group B: n=409; Group C (control group): n=433) were collected. Baseline demographic information and outcome measures in the three groups were published elsewhere (Appendix table) [37,20]. The mean score of the SFHS-1 in the control group was 7.27 at baseline and 7.22 at one-month follow-up. One-month test-retest reliability of the SFHS-1 in the control group was 0.76 (P<0.001). Table 4 shows that in these 1261 participants, family happiness was also significantly

and positively correlated with family harmony, family health, family communication, subjective happiness, physical and mental HRQoL at baseline, one-month follow-up and three-month follow-up (all $P<0.001$), regardless of the intervention effects. The correlation of family happiness with physical HRQoL was also significantly weaker than that with mental HRQoL at all three time points (all $P<0.001$), regardless of the intervention effects.

The correlation of family happiness with family harmony was significantly stronger than that with subjective happiness in both studies (all $P<0.001$). The correlation of family happiness with family health was also significantly stronger than that with subjective happiness in study 1 and study 2 at one-month and three-month follow-up (all $P<0.001$).

The improvement for family happiness at one-month and three-month follow-up was significantly greater in the intervention group than in the control group with a small effect size (Cohen effect size $d = 0.14$ and 0.18, respectively), indicating that SFHS-1 is responsive to change attributable to the intervention. These results have been published elsewhere [20].

Discussion

The present study examined the test-retest reliability and validity of the single-item Self-reported Family Happiness Scale (SFHS-1) designed by FAMILY Project team in both the general population and community settings. One-month test-retest denoted good temporal test-retest reliability of the SFHS-1. Respondents with a higher level of family happiness reported higher levels of subjective happiness, better family function and mental HRQoL, and less depression, consistently suggesting satisfactory convergent validity of the SFHS-1. Discriminant validity of the SFHS-1 was supported by the finding that family happiness was less strongly correlated with physical HRQoL than that with mental HRQoL. Incremental validity of the SFHS-1 was supported by the addition contribution of the SFHS-1 score in the prediction of subjective happiness. Women, older respondents and those with higher household income had a higher level of family happiness, indicating satisfactory known-groups validity of the SFHS-1. The SFHS-1 minimizes operational burdens of respondents and enables accurate measurement of family happiness, making it an attractive tool for large-scale studies.

Examination of the SFHS-1 construct validity has shown that it correlated well in the expected direction with other measures of emotional and family function. We found a significantly lower correlation between family happiness and physical health compared to mental health, consistent with previous studies which have shown a similar pattern of correlation between individual happiness and health [38,8]. Notably, family happiness was correlated with subjective happiness only with a medium magnitude, but strongly correlated with family harmony and health, indicating that family characteristics such as interpersonal closeness, mutuality and health among family members may be more important than individual happiness to determine family happiness [39].

We have designed the SFHS-1 with scores from 0 to 10 (11-point scale) because an 11-point scale is easier and quicker for respondents to use, along with more discriminating power than a 5-point scale i.e. scores from 1 to 5 [40]. It is also straightforward for the notion of rating "out of 10". Moreover, moderation is favored in Chinese culture [41]. Chinese people are generally reluctant to provide the most extreme scores or answers such as very happy or very unhappy, which may lead to difficulties in detecting small intervention effects based on scales with a narrow score range [42]. Change in this measure following our community-based family intervention programs showed the responsiveness of the SFHS-1 [19-21]. As we have also shown the test-retest reliability and construct validity in the context of repeated measurements, this simple scale should be highly practical for future community-based family intervention programs.

Previous studies have shown that people who are older, married, and have higher income have a higher level of individual happiness, both in Hong Kong [8] and Western countries [43,2]. Our study adds to

existing research by showing similar socio-demographic patterning for family happiness. More research is needed to promote family happiness in disadvantaged groups.

Our study has some limitations. First, the study sample is from an urban Hong Kong Chinese population. Future studies on the determinants of family happiness in rural and other Chinese communities outside Hong Kong are warranted. Second, all the data were obtained by self-report, perhaps resulting in the under-reporting of the negative answer options for the scales. In the social context of China, people might be less willing to report negative symptoms especially to strangers. However, the discriminant validity of the SFHS-1 mitigates such social desirability bias. Third, although no intervention was implemented in the control group, we could not fully eliminate the positive influences of tea gathering on family happiness when assessing the test-retest reliability. Nevertheless, good test-retest reliability of the SFHS-1 was still observed. Fourth, we cannot apply item response theory analysis to refine the items or assess the internal consistency given the nature of a single-item scale. In addition, a single-item scale may not be able to comprehensively address the heterogeneity of interpretation as family happiness is a very general concept.

Conclusions

The present study has shown that the SFHS-1 with one question only designed by FAMILY Project team is a reliable and valid measurement of family happiness in both the general population and community settings in Hong Kong. The SFHS-1 is also responsive to change attributable to the intervention. We have also provided scores of SFHS-1 by socio-demographic characteristics as a reference for comparison in future studies. As the SFHS-1 has light operational burden on respondents, it should be highly practicable for future large epidemiological studies and community-based family intervention programs.

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Conflicts of Interest

None declared.

Abbreviations

APGAR: Adaption, Partnership, Growth, Affection, Resolve
FCS: Family Communication Scale
FHInTS: Family and Health Information Trends Survey
HRQoL: Health-related Quality of Life
MCS: Mental Component Subscale
PCS: Physical Component Subscale
PHQ-2: 2-item Patient Health Questionnaire
SF-12: 12-item Short Form Health Survey
SFHS-1: Self-reported Family Happiness Scale
SHS: Subjective Happiness Scale

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Table 1 Demographic Characteristics of the participants of a population-based telephone survey (n=4038)

Demographics	Unweighted (%)	Weighted[a] (%)
Sex		
Men	38.0	45.1
Women	62.0	54.9
Age, years		
18-24	13.1	9.5
25-44	18.1	35.4
45-64	37.1	36.9
65 or above	31.8	18.2
Marital status		
Single	24.5	26.8
Married or cohabitated	61.8	63.2
Widowed or divorced	13.7	10.0
Education attainment		
Primary or below	22.3	23.7
Secondary	43.0	48.1
Tertiary or above	34.7	28.3
Employment status		
Unemployment	3.7	5.0
In paid employment	38.4	50.7
Retired	34.7	22.7
Housekeeper	15.0	15.5
Full-time student	8.2	6.1
Monthly household income (HK$)		
<20,000	44.8	40.7
20,000-29,999	16.3	18.3
30,000-39,999	12.3	13.3
40,000 or above	26.6	27.7

[a]: weighted by age, sex and educational attainment

US $1=HK $7.8

Table 2 The correlations of family happiness (SFHS-1) with family harmony, family health, family function, subjective happiness, health-related quality of life and depression by sex, age and education in the participants of a population-based telephone survey (n=4038)

	Family harmony (r)	Family health (r)	Family APGAR Scale (r)	Subjective Happiness Scale (r)	SF-12 Mental Component Subscale (r)	SF-12 Physical Component Subscale (r)	PHQ-2 (r_s)
Overall	0.79	0.67	0.41	0.52	0.40	0.17	-0.28
Sex							
Men	0.75	0.64	0.41	0.50	0.41	0.13[a]	-0.27
Women	0.81	0.68	0.41	0.53	0.39	0.21	-0.29
Age							
18-24	0.78	0.67	0.48	0.47	0.42	0.05[b]	-0.31
25-44	0.81	0.70	0.57	0.51	0.38	0.24	-0.32
45-64	0.81	0.69	0.38	0.53	0.37	0.24	-0.27
≥65	0.75	0.62	0.38	0.52	0.42	0.19	-0.22
Education level							
Primary or below	0.76	0.63	0.38	0.54	0.45	0.17[a]	-0.23
Secondary	0.80	0.68	0.40	0.54	0.41	0.23	-0.32
Tertiary or above	0.79	0.68	0.49	0.48	0.36	0.08[b]	-0.28

APGAR: Adaption, Partnership, Growth, Affection, Resolve

SF-12: The 12-item Short Form Health Survey Version 2

PHQ-2: The 2-item Patient Health Questionnaire

All P values for correlation coefficients < 0.001 except for [a]: P<0.05, [b]: P>0.05

r: Pearson correlation coefficient; r_s: Spearman correlation coefficient

Table 3 Self-reported Family Happiness Scale (SFHS-1) scores[a] by socio-demographic characteristics in the participants of a population-based telephone survey (n=4038)

	SFHS-1 Mean (95% CI)
Overall	7.47 (7.41, 7.53)
Sex	
Men	7.41 (7.32, 7.50)[b]
Women	7.52 (7.45, 7.60)
Age group	
18-24	7.06 (6.91, 7.21)[b]
25-44	7.42 (7.29, 7.56)
45-64	7.55 (7.46, 7.63)
≥65	7.63 (7.51, 7.74)
Marital status	
Single	7.06 (6.94, 7.18)[b]
Married or cohabitated	7.68 (7.61, 7.75)
Widowed or divorced	7.24 (7.06, 7.42)[c]
Education level	
Primary or below	7.45 (7.31, 7.59)[b]
Secondary	7.43 (7.35, 7.52)[c]
Tertiary or above	7.55 (7.47, 7.63)[c]
Employment status	
Unemployment	6.37 (6.00, 6.74)[b]
In paid employment	7.50 (7.42, 7.59)
Retired	7.59 (7.48, 7.70)
Housekeeper	7.69 (7.55, 7.82)
Full-time student	7.12 (6.94, 7.30)
Monthly household income (HK$)	
<20,000	7.10 (7.00, 7.20)[b]
20,000-29,999	7.42 (7.28, 7.56)
30,000-39,999	7.66 (7.52, 7.81)
40,000 or above	7.84 (7.74, 7.93)
Number of family members living together	
0	6.93 (6.70, 7.17)[b]
1	7.43 (7.30, 7.56)
2	7.43 (7.32, 7.54)
3	7.61 (7.51, 7.72)
4+	7.57 (7.44, 7.70)
Number of family members aged under 18 living together	
0	7.42 (7.35, 7.49)[b]
1	7.53 (7.41, 7.66)[c]
2	7.66 (7.50, 7.82)[c]
3+	7.32 (6.87, 7.78)[c]

US $1=HK $7.8

[a]: All data were weighted by sex, age and education level

[b]: Reference group
P value for the comparison with the reference group: all<0.05 except for [c]: P>0.05

Table 4 The correlations of family happiness (SFHS-1) with family harmony, family health, family communication, subjective happiness and health-related quality of life at baseline and follow-up in the participants of a community-based family intervention program (n=1261)

Correlation[a] with family happiness score (r)	Baseline (T1)	1-month follow-up (T3)	3-month follow-up (T4)
Family harmony	0.74	0.80	0.84
Family health	0.60	0.70	0.76
Family Communication Scale	0.51	0.65	0.66
Subjective Happiness Scale	0.56	0.62	0.68
SF-12 Mental Component Subscale	0.40	0.45	0.48
SF-12 Physical Component Subscale	0.17	0.20	0.19

SF-12: The 12-item Short Form Health Survey Version 2

All P values for correlation coefficients < 0.001

a: Partial correlation was used to account for the intervention effect when assessing the correlations at T3 and T4