



Title	Happy family kitchen: Behavioral outcomes of a brief community-based family intervention in Hong Kong
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Introduction

Positive communication among family members is essential for establishing mutual understanding, preventing conflict, and promoting intimacy and closeness in family relationships (Galvin, Bylund, & Brommel, 2004; Koerner & Fitzpatrick, 2002). Family communication is also associated with a wide range of well-being outcomes (Schrodt, Witt, & Messersmith, 2008; Segrin, 2006). However, families residing in Hong Kong, the most developed and westernized city in China, are often faced with long working hours and stressful urban lifestyles, which are major barriers for family communication. Local surveys in Hong Kong showed that family members rarely praise each other, listen to each other's views and concerns, and express care through physical gestures (Census and Statistics Department, 2010; School of Public Health, 2010). Therefore, as one of the main components of The FAMILY Project (Stewart, Fabrizio, Hirschmann, & Lam, 2012), Happy Family Kitchen (HFK I) was conducted to promote family well-being through advocating positive family communication (Ho et al., 2016). A community-based family intervention program was developed with a positive psychology framework and implemented in a family cooking and dining setting. Using a one-group pre-test and repeated post-test design over a 12-week period, results showed that the overall intervention program improved family communication quality, family health, happiness and harmony, and subjective happiness. The gratitude and savoring interventions improved all of the outcome measures while the happiness intervention improved family communication quality, family health, family happiness, and subjective happiness but not family harmony. The flow and health interventions improved family communication quality and subjective happiness, respectively.

Positive psychology is the scientific study of positive subjective experiences (e.g., satisfaction and happiness), positive individual traits (e.g., gratitude and love), and positive institutions (e.g., family) that promote quality of life and prevent pathologies from occurring (Seligman & Csikszentmihalyi, 2000). By adopting the positive psychology framework in a family-focused intervention, positive emotions, family strengths, and protective family skills can be developed to buffer against family problems and promote family functioning (Kauffman & Silberman, 2009; Sexton & Schuster, 2008; Sheridan, Warnes, Cowan, Schemm, & Clarke, 2004). Positive psychology interventions are effective for promoting various well-being outcomes such as life satisfaction, happiness, positive affect, optimism, and resilience (Odou & Vella-Brodick, 2013; Pietrowsky & Mikutta, 2012; Sin & Lyubomirsky, 2009). For example, a randomized controlled trial on the effectiveness of positive psychology exercises, such as gratitude, character strengths, and goodness in life, revealed that the intervention group showed

greater increases in happiness and greater decreases in depressive symptoms than the control group with sustainable effects up to six months (Seligman, Steen, Park, & Peterson, 2005). In a series of studies, the positive psychology exercises were combined to develop a positive psychotherapy for treating depression (Seligman, Rashid, & Parks, 2006). The first study examined the effectiveness of a six-session intervention with each session focusing on a particular theme such as character strengths, goodness in life, gratitude visit, and savoring. Results revealed that participants with mild to moderate depression reported lower levels of depressive symptoms and higher levels of life satisfaction with sustainable effects up to one year. The second study on the effectiveness of a 14-session intervention with additional topics such as optimism and meaning showed consistent results for participants with major depressive disorder. Consistently, a nine-session positive psychology intervention with each session emphasizing a specific theme, such as optimism, gratitude, savoring, and happiness, showed increases in life satisfaction, gratitude and happiness and decreases in depressive symptoms among older adults (Ho, Yeung, & Kwok, 2014). These interventions commonly involve behavioral exercises that can be integrated into daily routine, such as imagining the best interpersonal relationship (optimism), writing a gratitude letter about someone's kindness (gratitude), and writing about the most happy moments of life (happiness) (Dubois et al., 2012). The assumption of positive psychology interventions is that target behaviors represent the mechanism of change or proximal outcomes that lead to improvements in well-being. However, the effectiveness of these interventions on behavior change is unclear.

To address this gap in literature, the present study aims to: (1) explore whether the community-based positive psychology family intervention, which encompassed five positive psychology themes (i.e., gratitude, flow, happiness, health, and savoring), can promote target behaviors; and (2) examine the associations between target behaviors and psychosocial well-being (i.e., family communication, family well-being, and subjective happiness). A one-group pre-test and repeated post-test design was implemented to obtain quantitative data on the behavioral outcomes, and semi-structured focus group interviews were conducted to obtain qualitative data for substantiation of the findings. The mixed methods approach can produce comprehensive and contextualized results (Johnson, Onwuegbuzie, & Turner, 2007).

Method

Participants

The inclusion criteria for participation in the program were: (a) residents in the Yuen Long district; (b) willing to participate with one or more family members; (c) at least one family member was 18 years of age or older while the accompanying family member(s) was 6 years of age or older; and (d) able to read and speak Chinese. The participants were recruited by the local social service organizations through various methods, including (a) outreach recruitment in the community; (b) phone invitations; (c) face-to-face invitations at service centers; (d) social workers' referrals; (e) home visits to usual clients; and (f) promotion of the community program through pamphlets, posters, banners, and websites. Written consent was obtained from each participant prior to the intervention. In the case of children enrolled in the study, written consent was obtained from the next of kin, caretakers, or guardians on their behalf. Participation in the community program was completely voluntary and the participants had the right to withdraw at any time without consequences. Families were given two HK\$20.00 (about US\$5.00) supermarket gift vouchers for completing the questionnaires. Another HK\$50.00 (about US\$6.00) supermarket gift voucher was given to the participants for taking part in the focus group interviews. The study was approved by the Institutional Review Board of the University of Hong Kong/Hospital Authority Hong Kong West Cluster (UW 10-359).

A total of 2,722 individuals were invited, and 1,419 eligible participants from 612 families participated. Figure 1 shows that those who were aged 6 to 11 years ($n = 483$) were excluded from data analysis due to questionable validity of their responses in the assessments. Of the 936 participants who met the criteria, 67.5% were women, 37.9% were aged 35 to 44 years, and 64.2% had secondary education. The majority of the participating families were composed of adults and children (71.1%).

Procedure

Briefly, a 2-day train-the-trainer workshop, delivered by a clinical psychologist and professional academics, provided the collaborating social service workers with sufficient knowledge and skills to design and implement the community programs. The workshop covered five themes of positive psychology, evidence-based practice, and program implementation, design and evaluation. A practice manual was distributed to the social service workers as a practical guide to enhance consistency of the community programs across social service units. Each of the 23 social service units chose one of five positive psychology themes, designed and implemented a community program. A one-group pre-test and repeated post-test design was used to evaluate the effectiveness of the programs (Soong et al.,

2015). Intervention outcomes were assessed using self-administered questionnaires at 4 time points: pre-intervention (baseline assessment, T₁), immediate post-intervention (immediately after the core session, T₂), 6 weeks post-intervention (after the booster session, T₃), and 12 weeks post-intervention (T₄).

To substantiate the quantitative findings, semi-structured focus group interviews were conducted to explore the communication experience of the families after participating in the programs, particularly the extent to which the intervention had enhanced family communication and the barriers encountered by the family members. Participation was completely voluntary and written consent was obtained before the interview. Semi-structured interview guidelines and prompts were developed according to the standard focus group protocol (Krueger & Casey, 2000) to cover the aims of the study and the specific theme of the program. Led by one moderator with the help of two note-takers, the focus groups were conducted with flexibility to allow unanticipated themes to emerge. A total of 207 participants from 196 families were interviewed in 21 focus groups, with 5 to 13 participants in each group. The group discussions, which were audio recorded, lasted for about 60 minutes in a quiet venue arranged by the social service units.

With the supervision of the researchers, the trained social service workers designed and implemented 23 community programs, each with a focus on one of five positive psychology themes of their choice: 13 on gratitude ($n = 765$), three on flow ($n = 142$), three on happiness ($n = 296$), three on health ($n = 171$), and one on savoring ($n = 45$). Target behaviors of the overall intervention (i.e., family communication time, frequency of eating with family members, and frequency of meal preparation with family members) and theme-specific behavioral indicators (Table 1) guided the purpose and content of the intervention programs. The theme-specific behavioral indicators were developed by the present investigators and a clinical psychologist through operationalizing concepts from the positive psychology literature and contextualizing them in a cooking and dining setting. Each community program consisted of two 2-3 hour core sessions and a 1-hour booster session, held 6 weeks after the core sessions. The two core sessions emphasized positive family communication, which were run in the form of group activities and homework assignments, while the booster session was held to consolidate the knowledge and skills from the core sessions. The group activities provided the participants with the opportunity to practice the target behaviors during the intervention program while the homework assignments reinforced the target behaviors at home. The “gratitude” theme emphasized the expression of gratefulness and appreciation for family members’ contributions (Peterson & Seligman, 2004). The “flow” theme focused on engrossing and enjoyable family activities that facilitate cooperation

among family members and discovery and utilization of each other's strengths (Csikszentmihalyi, 1997). The "happiness" theme aimed to nurture positive emotions by advocating positive family interactions (Seligman, 2002). The "health" theme promoted both mental and physical health among family members by developing optimism and resilience for mental health, and encouraging a healthy lifestyle for physical health (Seligman, Park, & Peterson, 2004). The "savoring" theme involved cherishing and enjoying every moment of a family gathering (Seligman et al., 2006).

To ensure quality, consistency, and adherence to program guidelines, a project steering committee, consisting of research investigators and managerial staff from the partnering social service units, critically reviewed the proposals for each community program prior to implementation. Comments and suggestions on the proposals were provided to the social service units and revisions were then made for final approval for funding. Each of the core and booster sessions was observed by a research assistant to evaluate the process of the intervention. As reported by the observers, the extent to which the intervention was delivered as planned was high, with a mean score of 5.21 ($SD = 1.15$) on a 7-point scale (1 = *very unsuccessful*, 7 = *very successful*), suggesting that the intervention was successfully delivered according to the program proposal (Ho et al., 2016).

Measures

Target behaviors. Three single-item behavioral indicators were used to measure the behavioral outcomes of the overall intervention, including family communication time (minutes per day), frequency of eating with family members (times per week), and frequency of meal preparation with family members (times per week). Using an approach common to intervention research targeting specific processes (Anshel, Brinthaup, & Kang, 2010; Hawkins et al., 2010; Park & Gaffey, 2007; Prochaska et al., 2012), theme-specific behavioral indicators were included as questionnaire items to measure the behavioral outcomes of each of the five positive psychology programs (Table 1). Responses were made on a scale of 1 (*never*) to 5 (*always*), with a higher total score indicating more of the target behavior. Behavioral outcomes were measured at T₁, T₃, and T₄.

Family communication scale. The quality of family communication was measured using a 10-item scale from T₁ to T₄ (Olson & Barnes, 2004). Responses were made on a scale of 1 (*strongly agree*) to 5 (*strongly disagree*), with a higher total score indicating more positive communication after reverse coding. For example, "Family members are satisfied with how they communicate with each other". The scale was translated into Chinese

using the translation/back-translation procedure. The Cronbach's alpha ranged from .92 to .95 for the 4 time points, indicating that the scale reliability was high.

Family health, happiness and harmony. Family well-being, including health, happiness and harmony, were measured using three single-item indicators from T₁ to T₄ (Wang et al., 2014). Responses were made on a scale of 0 (*not at all*) to 10 (*very much*), with higher scores indicating a healthier, happier and more harmonious family. The family health question was "Do you think your family is healthy?" The family happiness question was "Do you think your family is happy?" The family harmony question was "Do you think your family is harmonious?"

Subjective happiness scale. Subjective happiness was measured using a 4-item scale from T₁ to T₄ (Lyubomirsky & Lepper, 1999). Responses were given on a 7-point scale (e.g., 1 = *less happy*, 7 = *more happy*), with a higher total score indicating a higher level of happiness. For example, "Compared to most of my peers, I consider myself more happy". The Chinese version of the scale has been validated in Hong Kong (Nan et al., 2014). The Cronbach's alpha ranged from .62 to .71 for the 4 time points, indicating that the scale reliability was acceptable.

Data Analysis

Statistical analyses of quantitative data were performed using IBM SPSS Statistics version 20.0 ("IBM SPSS Statistics for Windows, Version 20.0," 2011). The principle of intention-to-treat analysis (Fisher et al., 1990) was adopted through the expectation-maximization method (EM), which uses the EM Algorithm to impute and replace missing observations due to lost to follow-up or refusal to complete the questionnaire (Dempster, Laird, & Rubin, 1977). This has more advantages than last observation carried forward analysis and complete case analysis, as it can produce more valid and reliable results (Blankers, Koeter, & Schippers, 2010). Since the theme-specific behavioral indicators were developed for the purposes of this study, exploratory factor analysis was conducted to explore the interrelations among the behaviors, identify their common underlying dimensions, and generate factor scores for subsequent analyses (Fabrigar, Wegener, MacCallum, & Strahan, 1999). This was achieved using the principal axis factoring extraction with promax rotation to allow factors to correlate. This analysis allows the reduction of a large set of data to a smaller subset of measurement variables, which improves the interpretability of the results, overcomes multicollinearity issues caused by highly correlated items, and reduces the inflation of type I error due to multiple statistical testing (Field, 2013). Repeated measures analysis of variance was then conducted to compare the mean scores of the target behaviors between the three time points (T₁, T₃, and T₄). An effect size (Cohen's *d*) of .2 was considered as a small effect, .5 as a medium effect, and .8 or above as a large effect (Cohen,

1977). Linear regression was conducted to examine the associations between target behaviors and psychosocial well-being after the intervention (T₃ and T₄). Due to the possibility of nonindependence of ratings from family members, sensitivity analysis using a sample comprising of one randomly selected participant from each family was conducted. It yielded largely similar results; thus, only the results from the whole sample are presented.

To ensure the reliability of the qualitative data, audio records were transcribed verbatim into Chinese. At least 10% of the transcripts were double-checked against the recordings for accuracy. Thematic analysis was conducted to identify, analyze and report themes from the qualitative data (Braun & Clarke, 2006). To ensure objectivity during the analysis, a panel of two researchers who were not involved in the study design read the transcripts in detail, coded sentences according to the respondents' meaning, and then used a process of constant comparisons to identify the main themes and sub-themes. When the coding differed between the researchers, themes were reanalyzed and checked against other coded data until a consensus was reached. Finally, the transcripts were reviewed to validate the thematic analysis and to ensure that all meaningful interview data had been analyzed.

Results

Factor solution of the theme-specific behavioral indicators

The Kaiser-Meyer-Olkin (KMO) measure verified the sampling adequacy for the analysis of each theme with values above the acceptable limit of .5 (gratitude = .81; flow = .81; happiness = .82; health = .66; savoring = .72). Scree plots showed that the gratitude, flow, and savoring behavioral indicators yielded one-factor solutions and the happiness and health behavioral indicators yielded two-factor solutions. Table 1 shows that one-factor solutions for gratitude, flow, and savoring had eigenvalues over Kaiser's criterion of 1 and explained 72.86%, 56.19%, and 47.32% of the variance, respectively. For happiness and health, two-factor solutions had eigenvalues over Kaiser's criterion of 1 and explained 65.23% and 64.31% of the variance, respectively. Factor loadings of .3 or greater were examined to aid the interpretation (Table 1). Four of the five gratitude items had high loadings on the same factor, ranging from .64 to .89. The remaining gratitude item had a low factor loading (< .3) and was therefore removed from the scale. For flow, all seven items loaded onto the same factor, ranging from .55 to .84. The happiness items yielded a two-factor solution, with two items loaded highly onto the happy memory dimension (.78 and .94) and five items loaded onto the happiness behavior dimension (.59 to .75). Similarly, the health items loaded onto two factors, with two items loaded onto the health attitude dimension (.61 and .86) and four items loaded onto

the health behavior dimension (.53 to .77). For savoring, all five items loaded onto the same factor, ranging from .33 to .74. Therefore, the scree plots, eigenvalues, percentage of variance, and factor loadings converged on the factor solution of each theme. For reliability across the 3 time points, the Cronbach's alpha ranged from .88 to .92 for gratitude, .56 to .87 for flow, .81 to .86 for happy memory, .80 to .87 for happiness behavior, .45 to .66 for health attitude, .73 to .89 for health behavior, and .58 to .71 for savoring.

Intervention effects on target behaviors

For overall intervention effects (Table 2), family communication time and frequency of meal preparation with family members significantly increased over time ($p = .002, d = .17$; $p = .02, d = .13$, respectively), with a significant increase from baseline to T₃ ($p = .001, d = .23$; $p = .05, d = .13$, respectively) and T₄ ($p = .03, d = .14$; $p = .01, d = .17$, respectively). However, frequency of eating with family members did not significantly increase over time ($p = .36, d = .06$).

For theme-specific effects (Table 3), the gratitude intervention significantly increased gratitude behavior over time ($p < .001, d = .34$), with a significant increase from baseline to T₃ ($p < .001, d = .51$). The flow intervention significantly increased flow behavior over time ($p < .001, d = .77$), with a significant increase from baseline to T₄ ($p < .001, d = .94$). For the happiness intervention, happy memory and happiness behavior significantly increased over time ($p < .001, d = .45$; $p = .001, d = .35$, respectively), with a significant increase from baseline to T₃ ($p < .001, d = .52$; $p = .002, d = .41$, respectively) and T₄ ($p < .001, d = .52$; $p = .003, d = .41$, respectively). Although the health intervention significantly increased health behavior over time ($p < .001, d = .70$), with a significant increase from baseline to T₃ ($p < .001, d = .73$), it also significantly decreased health attitude over time ($p < .001, d = .58$), with a significant decrease from baseline to T₃ ($p < .001, d = -.69$). There were no significant increases in savoring behavior over time in the savoring intervention ($p = .32, d = .33$).

Association between behavioral indicators and psychosocial well-being

Table 4 shows that family communication time and frequency of eating with family members were positively associated with family communication ($B = .02, p < .001$; $B = 1.69, p < .001$, respectively), family health ($B = .002, p < .001$; $B = .11, p < .001$, respectively), family happiness ($B = .002, p < .001$; $B = .13, p < .001$, respectively), family harmony ($B = .002, p < .001$; $B = .09, p = .001$, respectively), and subjective happiness at T₃ ($B = .01, p = .02$; $B = 1.25, p < .001$, respectively). Similar results were found at T₄. The frequency of meal preparation

with family members was only positively associated with subjective happiness at T₄ ($B = 1.03, p = .01$; $B = .64, p = .03$, respectively).

For theme-specific behavioral indicators (Table 5), gratitude, flow, happiness behavior, health attitude, and health behavior were positively associated with family communication, family health, family happiness, family harmony, and subjective happiness at T₃. Similar results were found at T₄. However, savoring behavior was not associated with psychosocial well-being at T₃ and T₄.

Qualitative results

The focus group results showed that the intervention program was effective in promoting positive verbal and nonverbal forms of communication among family members. In particular, the participants reported improved quantity and quality of family communication, greater expressed appreciation for family members' contributions, and more involvement of family members in household chores.

For quantity and quality of family communication, participants reported that not only did they spend more time chatting with their family members but they also looked for better communication quality. As indicated in the quote below, different communication strategies were used to enrich parent-child communication after participating in the intervention program.

“I have three kids, and the three of them chatted together while I chatted with my husband (during dinner; before the intervention)... Now (after the intervention)... I... sometimes interrupt their discussion, talk about some IQ questions and jokes... If I let them (the kids) continue to chat about the things that involved them alone, the gap between the kids and us (husband and I) would become larger...” (Woman, from the 35–44 years age group, gratitude intervention)

Another change that was noted by the participants was expression of appreciation towards family members, particularly to mothers. Gender division of labor was deeply rooted in the families, with mothers taking the primary role of managing all of the housework. The mothers' contributions were always taken for granted. However, after the program, mothers reported that their children would now understand their hard work and actively praised them.

“‘You bring a lot of stuff home (for the family) every day after work, oh, thank you mum! You help me do a lot of things.’ (The child) he/she... is aware that I help him/her do these things. In the past, I had to handle (housework) as a mother. He/she took everything for granted! But now

(it's) different... he/she would say thank you... even (my) elder son, he knows how to praise me, 'Mum, I will give you a massage. You are very tired, right? (If you're) very tired, take some rest! (You) don't have to prepare the dinner so quickly!'" (Woman, aged 35–44 years, gratitude intervention)

In addition to verbal communication, nonverbal communication also improved among family members in the form of parenting strategies. Prior to the intervention, many of the parents refrained from letting their children help out with the housework because they feared that accidents could happen. As a result, many parents would prepare meals for their children. However, since the intervention program offered the opportunity to not only eat together but also prepare family meals together, parents started to trust the ability of their children and invited them to prepare meals together.

"My sons are rather young, one is nine and one is six... [Did you invite your children to help with the housework?] Rarely, because I thought my kids were so young and the boys were clumsy (in doing housework). Don't get in my way (while I am doing housework)! I preferred to do everything myself. That was what I thought... (However, now) I will let them try some simple tasks, such as washing the dishes, stir-frying an egg..." (Woman, aged 35–44 years, happiness intervention)

The thematic programs generally met their respective aims to promote theme-specific behavior changes after the intervention among the focus group participants. Those who had received the gratitude intervention praised their family members and said "thank you/sorry" more frequently after the intervention. Those who attended the health intervention paid more attention to their diet and were more likely to maintain well-balanced food consumption. Those who participated in the happiness intervention spent happier times with family members than before. Participants from the flow and savoring interventions paid more attention to quality time spent during dinner by eating more attentively and slowly, and chatting more with their family members.

It is not common for Chinese parents to praise their children. Therefore, the gratitude intervention encouraged family members to appreciate and praise each other more. Parents acknowledged that the intervention had motivated them to practice this positive behavior and become accustomed to it.

“I appreciated them (my children) more... I felt uneasy about praising them at the beginning. But when I did more, I found that it is quite natural to do so.” (Woman, aged 45–54 years, gratitude intervention)

To facilitate positive communication in family meals, family members should be fully attentive towards each other’s thoughts, feelings, concerns and experiences. Therefore, the flow intervention encouraged family members to pay more attention during family meals and put aside unrelated tasks and distractions. The participants noted a shift in focus from the television to family sharing during family meals after participating in the program.

“My children used to focus on the television during dinner... (Now) I let them watch television for half an hour before we have dinner (with the television switched off). We chat at the table and share happy things that happened that day!” (Woman, aged 35–44 years, flow intervention)

The happiness intervention aimed to increase positive emotions by encouraging positive interactions. In support of this aim, the participants noted that negative emotions that accompany family communication had been managed and reduced after participating in the program.

“My husband had a bad temper before... After the (intervention) courses, he has calmed down a lot.” (Woman, aged 65 years and above, happiness intervention)

The health intervention focused on the overall health of family members and encouraged participants to proactively pursue a healthy lifestyle. In support of this, a change in lifestyle was observed among the participants of the health intervention. The participants noted that they paid more attention to their diet and that family members influenced each other’s food choices through reminders.

“My child reminds me not to eat junk food... she (my child) pays attention to what she eats (now), but previously (before the intervention) she just ate whatever I gave her.” (Woman, aged 35–44 years, health intervention)

The busy lives of urban families often hinder the enjoyment of everyday life. The savoring intervention served to remind families that meals can be cherished by eating slowly and savoring the food prepared by family members. This was reflected in the participants’ account of a family meal experience after taking part in the savoring intervention.

“... eat slowly in order to taste it attentively... look at the way the dumpling was made...” (Man, aged 65 years and above, savoring intervention)”

Discussion

The quantitative results showed that the overall intervention program was effective in promoting family communication time at T₃ and T₄ and frequency of meal preparation with family members at T₃ and T₄. The gratitude, flow, and happiness interventions were effective in increasing theme-specific behaviors, the health intervention provided mixed results, and the savoring intervention was ineffective in increasing savoring behavior. Furthermore, family communication time, frequency of eating with family members, and theme-specific behaviors including gratitude, flow, happiness behavior, health attitude, and health behavior, were positively associated with psychosocial well-being. The qualitative results provided additional evidence and generated in-depth insights into the rationale behind the behavior change, as well as the thoughts and feelings associated with changes in the family after participating in the program. The slightly different finding between quantitative and qualitative methods (i.e., health and savoring interventions) could be due to the sensitivity of focus group interviews in identifying changes in specific participants, which could be missed when interpreting changes in mean scores from questionnaire assessments.

By exploring whether positive psychology interventions can promote behavior change, our findings extend previous research on positive psychology, which has generally provided evidence for well-being outcomes while behavioral outcomes have been largely ignored (Odou & Vella-Brodrick, 2013; Pietrowsky & Mikutta, 2012; Seligman et al., 2006; Seligman et al., 2005; Sin & Lyubomirsky, 2009). The overall findings generally concur with the assumption of positive psychology interventions that the behavioral exercises can induce changes in target behaviors, which act as the mechanism of change or proximal outcomes that promote changes in well-being. Our intervention emphasized the importance of family communication and family cooking and dining practices. By tailoring the intervention program to these two elements, we showed that positive psychology intervention can also increase family communication time and frequency of meal preparation with family members. Furthermore, family communication time and frequency of eating with family members were positively associated with most of the psychosocial well-being outcomes. These findings are consistent with prior research on the effectiveness of a positive psychology intervention on family communication, family well-being, and subjective happiness (Ho et al.,

2016), suggesting that improvements in well-being as a function of the intervention may be associated with increases in family communication time.

Eating with family members is a common practice in Chinese families for the purposes of family bonding and knowledge transfer between generations (Lai-Yeung, 2015). We did not find an increase in frequency because the baseline frequency of 4.5 times per week was high, leaving little room for improvement for this target behavior (i.e., ceiling effect). Furthermore, because of work and other constraints, further increase in frequency of eating together might not be feasible. However, the positive association between the frequency of eating with family members and psychosocial well-being is largely consistent with what has been found in family research. In particular, prior research has shown that the frequency of family meals is associated with a wide range of positive psychosocial, physical and behavioral outcomes (Christian, Evans, Hancock, Nykjaer, & Cade, 2013; Eisenberg, Neumark-Sztainer, Fulkerson, & Story, 2008; Fulkerson, Neumark-Sztainer, & Story, 2006), which is due in part to the positive family interactions that take place during family meals to express emotions and exchange information (Fulkerson et al., 2010; Sobal, 2000). While the intervention was able to increase the frequency of meal preparation with family members, this behavior was unrelated to most of the psychosocial well-being outcomes except subjective happiness. Therefore, the positive effect of family meals may be differentiated by the particular mealtime practice involved, with meal preparation with family members having less impact on psychosocial well-being compared to eating with family members. Future research should explore the individual impact of other components of a family meal, such as grocery shopping, setting the dining table, and washing the dishes.

Another important contribution of our study is the assessment of theme-specific behaviors. Since our intervention was modified for families with emphasis on mealtime practices, the target behaviors were developed according to the specific themes of the intervention. In contrast to previous research findings on the effectiveness of positive psychology exercises (Dubois et al., 2012), our quantitative results showed that not all of the positive psychology themes can promote theme-specific behaviors. Positive results in the gratitude, flow, and happiness interventions suggest that improvements in well-being as a function of these thematic programs (Ho et al., 2016) may be associated with increases in theme-specific behaviors. The mixed result for the health intervention suggest that even if the theme-specific behaviors are associated with psychosocial well-being, the intervention would not be effective if the change mechanism is not activated. The increase in health behavior and decrease in health attitude should cancel out each other's effect on well-being. This interpretation is consistent with the previous finding that

the health intervention was not effective on family communication and well-being (Ho et al., 2016). A possible reason for the mixed result may be that the health theme was more difficult to comprehend than the other four themes because it encompasses both mental and physical health dimensions. The intensity of this brief intervention program may be insufficient for promoting abstract and sophisticated responses. However, our qualitative results suggest that some participants may benefit from the health intervention. Nevertheless, behavioral exercises that are meaningful, pleasurable, and feasible in daily routine are recommended (Seligman et al., 2005). The non-significant results for the savoring intervention suggest that it was unable to promote savoring behavior and that this behavior was unassociated with psychosocial well-being. While the literature have provided positive results for the savoring intervention on well-being outcomes (Ho et al., 2016; Hurley & Kwon, 2012), the underlying mechanism of this theme remains unclear. However, a possible explanation may be that there were an insufficient number of participants in the savoring intervention to detect an effect in the present study. The effect sizes and beta values for this thematic program were not small and could become significant with a larger sample. The qualitative results, which could not represent all of the participants, did support the positive effect of the savoring intervention on savoring behavior. Further research is needed to clarify the behavioral outcomes of the savoring intervention and determine whether savoring behavior can in turn promote psychosocial well-being.

Based on the findings of this study, future research on positive psychology interventions should also assess behavior change in addition to psychosocial well-being to shed light on the change mechanism of intervention effects. This study contributes to the positive psychology as well as the family communication literature by offering a viable, attractive and simple approach to enhance family communication in a cooking and dining setting. More research is needed to provide definitive evidence on the effectiveness of brief intervention programs that emphasize gratitude and happiness themes to promote family communication and well-being in the community.

Limitations

This study had several limitations. First, a one-group pre-test and repeated post-test design was used to evaluate the effectiveness of the intervention because it was not feasible to include a control group and thus the strength of the evidence was compromised. Future research, if feasible, should include a control group. Second, convenience sampling was adopted by recruiting participants through social service organizations. The findings may not be generalizable to the hard-to-reach population. Third, due to the exclusion of participants aged 6 to 11 years from the analysis, the findings could not represent young individuals who were unable to provide valid responses in

questionnaires. Fourth, the Cronbach's alphas for the flow (T₃), health attitude (T₁, T₄), and savoring scales (T₄) were low, which might have reduced the reliability of the findings. Future development of validated behavioral scales for assessing theme-specific behaviors of positive psychology interventions is warranted. Finally, the Chinese version of the family communication scale has not been validated. Future research should validate this translated scale for application in Chinese populations.

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Author Contributions

HH performed the statistical analysis, interpreted the data, and wrote the manuscript; MM participated in the design, implementation, and coordination; AW participated in the design, implementation, and coordination; SS contributed to the conceptualization and writing of the manuscript; CY participated in the design and implementation; THL participated in the design, coordination, and conceptualization and writing of the manuscript; and SC participated in the design, coordination, and conceptualization. All authors read and approved the final manuscript.

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Table 1. Factor loadings of theme-specific behavioral indicators

Item	Factor	
	1	2
Gratitude		
1. Criticize your family members ^R	-.22	
2. Express thanks to your family members through words/action	.76	
3. Praise the strength and goodness of your family members through words/action	.89	
4. Express appreciation for your family member's dedication through words/action	.88	
5. Provide kind and positive suggestions to your family members	.64	
Eigenvalues	2.91	
% of variance	72.86	
Flow		
1. Shared happy experiences with your family when dining together	.57	
2. Assigned cooking duties according to the strengths of family members	.73	
3. Observed the character strengths of family members during meal preparation and informed them of what you have observed	.74	
4. Encouraged family members to be involved in cooking/preparing/tidying/washing dishes etc. to develop a habit of cooperation	.78	
5. Creatively designed new dishes with your family members	.67	
6. Invited family members to cook/prepare/tidy/wash dishes	.84	
7. Tried to put personal worries aside during family meals and attend to family conversations with active response	.55	
Eigenvalues	3.93	
% of variance	56.19	
Happiness		
1. Smiled during family meals to bring a sense of happiness to your family	.75	
2. Shared happiness with your family members	.66	
3. Said "Let's eat together" to each other before family meals	.59	
4. Served food according to your family members' preferences	.63	
5. Recorded experiences that made you or your family happy		.78
6. Developed a habit of recalling happy experiences		.94
7. Worked hard for your ideal happy family	.62	
Eigenvalues	3.57	1.00
% of variance	50.92	14.31
Health		
1. Being optimistic		.86
2. When things go wrong, you will face it with courage		.61
3. Considered various possibilities to develop a holistic solution when in difficulty	.73	
4. Tried to be supportive when family members encountered an unhappy event	.77	
5. Wrote down encouraging words and posted them up at home for everyone to see	.59	
6. Chose or prepared food using "3 low, 1 high" (low fat, sugar, salt; high fiber)	.53	
Eigenvalues	2.45	1.41
% of variance	40.87	23.44
Savoring		
1. Savored food by observing its color, smell and taste	.74	
2. Attended to the needs of family members when dining together, such as refilling rice, soup, or serving food	.33	
3. Ate more slowly to feel and savor the taste of food	.68	
4. Treasured the time when dining with family members	.56	
5. Shared the joy of meal preparation with your family members	.59	
Eigenvalues	2.37	
% of variance	47.32	

Note. Exploratory factor analyses were run separately for each theme. Factor loadings of less than .30 are not shown.

^R The item was reversely coded.

Table 2. Changes in behavioral indicators from baseline to 6 weeks and 12 weeks post-intervention

Behavioral indicators	<i>M (SD)</i> ^a			<i>F (df, df_{error})</i>	<i>p</i>	<i>d</i> ^b
	Baseline (T ₁)	6 weeks (T ₃)	12 weeks (T ₄)			
Family communication time (minutes per day)	150.63 (125.38)	174.45 (112.03)	163.41 (108.19)	6.41 (2, 1868)	.002	.17
Frequency of eating with family members (times per week)	4.54 (1.97)	4.46 (1.84)	4.61 (1.77)	1.02 (2, 1868)	.36	.06
Frequency of meal preparation with family members (times per week)	3.93 (2.60)	4.28 (2.29)	4.13 (2.33)	4.09 (2, 1868)	.02	.13

Note. Theme effect was included as a covariate.

^a Behavioral outcomes were not assessed at T₂.

^b Cohen's *d* (small = .20; medium = .50; large = .80).

Table 3. Changes in theme-specific behavioral indicators from baseline to 6 weeks and 12 weeks post-intervention

Theme-specific behavioral indicators ^a	<i>M (SD)</i> ^b			<i>F (df, df_{error})</i>	<i>p</i>	<i>d</i> ^c
	Baseline (T ₁)	6 weeks (T ₃)	12 weeks (T ₄)			
Gratitude	3.23 (.78)	3.39 (.67)	3.30 (.70)	13.08 (2, 920)	< .001	.34
Flow	2.97 (.80)	3.08 (.42)	3.36 (.53)	14.19 (2, 190)	< .001	.77
Happiness						
Happy memory	2.91 (1.13)	3.16 (.87)	3.23 (.83)	10.88 (2, 434)	< .001	.45
Happiness behavior	3.60 (.78)	3.74 (.65)	3.75 (.66)	6.67 (2, 434)	< .001	.35
Health						
Health attitude	4.39 (.96)	4.04 (1.09)	4.42 (.79)	9.71 (2, 234)	< .001	.58
Health behavior	3.11 (.77)	3.50 (.93)	3.12 (.74)	14.18 (2, 234)	< .001	.70
Savoring	3.23 (.90)	3.42 (.75)	3.32 (.68)	1.15 (2, 84)	.32	.33

^a Scales range from 1 – 5.

^b Behavioral outcomes were not assessed at T₂.

^c Cohen's *d* (small = .20; medium = .50; large = .80).

Table 4. Linear regression of the associations between behavioral indicators and psychosocial well-being at 6 weeks and 12 weeks

Behavioral indicators	Family communication			Family health			Family happiness			Family harmony			Subjective happiness		
	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>
6 weeks (T ₃)															
Family communication time (minutes per day)	.02	.00	< .001	.002	.00	< .001	.002	.00	< .001	.002	.00	< .001	.01	.00	.02
Frequency of eating with family members (times per week)	1.69	.27	< .001	.11	.03	< .001	.13	.03	< .001	.09	.03	.001	1.25	.33	< .001
Frequency of meal preparation with family members (times per week)	-.28	.21	.19	.01	.02	.61	.01	.02	.75	.04	.02	.10	.35	.26	.18
12 weeks (T ₄)															
Family communication time (minutes per day)	.02	.00	< .001	.001	.00	.001	.002	.00	< .001	.002	.00	< .001	.00	.01	.47
Frequency of eating with family members (times per week)	1.58	.27	< .001	.09	.03	.008	.12	.03	< .001	.11	.03	< .001	1.03	.38	.007
Frequency of meal preparation with family members (times per week)	-.10	.20	.64	.01	.02	.65	.00	.03	.93	.02	.02	.54	.64	.29	.03

Note. Behavioral indicators were entered in the same block and theme effect was included as a covariate.

Table 5. Linear regression of the associations between theme-specific behavioral indicators and psychosocial well-being at 6 weeks and 12 weeks

Theme-specific behavioral indicators ^a	Family communication			Family health			Family happiness			Family harmony			Subjective happiness		
	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>p</i>
6 weeks (T ₃)															
Gratitude	9.47	.76	< .001	.80	.10	< .001	.81	.09	< .001	.78	.09	< .001	9.63	.94	< .001
Flow	7.70	2.31	.001	.88	.30	.004	1.06	.25	< .001	.79	.26	.003	8.78	3.06	.01
Happiness															
Happy memory	3.64	1.09	.001	.01	.11	.95	.13	.10	.20	.04	.11	.71	2.85	1.28	.03
Happiness behavior	5.29	1.47	< .001	.89	.14	< .001	.91	.14	< .001	.94	.14	< .001	8.08	1.72	< .001
Health															
Health attitude	2.39	1.00	.02	.21	.09	.02	.25	.09	.01	.27	.09	.003	4.09	.99	< .001
Health behavior	4.01	1.17	.001	.31	.10	.003	.25	.11	.02	.32	.10	.002	3.70	1.16	.002
Savoring	1.76	2.10	.41	.25	.37	.51	-.10	.33	.77	-.01	.29	.99	7.27	3.74	.06
12 weeks (T ₄)															
Gratitude	6.59	.77	< .001	.47	.09	< .001	.67	.09	< .001	.61	.09	< .001	7.52	1.08	< .001
Flow	9.67	1.65	< .001	.34	.27	.21	.73	.23	.002	.75	.21	.001	9.49	2.63	< .001
Happiness															
Happy memory	1.01	1.01	.32	.07	.11	.52	.19	.12	.13	.19	.11	.09	-2.25	1.31	.09
Happiness behavior	7.01	1.27	< .001	.79	.14	< .001	.82	.16	< .001	.71	.14	< .001	9.81	1.65	< .001
Health															
Health attitude	3.15	1.20	.01	.36	.11	.001	.43	.11	< .001	.51	.14	< .001	8.54	1.62	< .001
Health behavior	7.80	1.28	< .001	.59	.11	< .001	.60	.12	< .001	.58	.14	< .001	5.46	1.74	.002
Savoring	3.44	2.29	.14	-.11	.40	.79	.51	.43	.24	.62	.44	.16	2.49	3.33	.46

Note. Linear regressions were run separately for each theme.

^a Scales range from 1 – 5.

Figures

Figure 1. Flowchart of participants in Happy Family Kitchen through each stage of the study. Behavioral outcomes were not assessed at T₂. Adapted from Ho et al., 2016. Copyright 2016 by the American Psychological Association.