# GENDER DIFFERENCES IN EFFECTIVENESS OF A NUTRITIONAL SELF-MANAGEMENT PROGRAM FOR COMMUNITY-LIVING OLDER ADULTS

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**Abstract** - The aims of this study was to determine whether there were gender differences after received a dietary self-management program for older community-dwelling adults. A quasi-experimental study was used. Older adults were recruited from two randomly selected public health centres in north-eastern of Taiwan. Data were collected at baseline and 12 weeks and the nonparametric models were chosen to examine group differences. 20 male and 38 female older adults received the nutritional self-management program and completed the study. We compared the main outcomes in the end of 12 weeks and found that men were better than women at nutritional status, internal health locus of control, and program satisfaction than women. Moreover, the feedback of the program was also differed from gender. We suggested that self-management nutritional program can be effectively delivered in the community-dwelling older adults; however, the nutritional intervention should consider gender difference.

**Index Terms** - Gender, Older Adults, Nutrition, Self-Management Program

## I. INTRODUCTION

Food is central to life, and was captured by the old Chinese saying 'Nothing is more important than eating (min yi shi wei tian)' [1]. Nutrition is a crucial role in determining successful aging and is closely linked with health, and nutritional health is difference between women and men [2]- [3]. Reference [4] identifies gender as significant factors influencing the nutritional status of the older adults, and Reference [5] commented that female have significantly relatively high risk of developing nutritional related disease. When program applied, there were different effects in gender [3], [6]- [7]. In Chinese, men and women frequently think and behave differently and therefore nutritional health status is difference from gender [8]. To our knowledge, there are few studies evaluated the difference between men and women after nutritional program for Chinese older adults living in community. Hence, there have a room for testing the gender difference regarding receive the nutritional program for older adults living in community.

## II. METHOD

### A. Aim

The aim of the study were to determine whether there were gender differences after received a dietary self-management program for older community-dwelling adults.

### B. Study Design

A quasi-experimental design was used, and data were collected before and at the end of the 12-week.

### C. Participants

Older adults were purposely sampled from randomly chosen two public health centres and the inclusion criteria were: > 65 years old, non-institutionalised, ambulatory, lived with family members, could communicate orally or in writing, and had not taken part in any research studies involving a nutrition program. We excluded the older adults if they had a terminal disease, e.g., advanced cancer or end-stage renal disease.

### D. Self-management Program

A simple behavioural approach is better for older adults than interventions targeting multiple behaviours because it is more focused, less confusing and better suited to comprehensively addressing intervention components [9], we simplified the self-management program by focusing on the most important dietary factors for older Chinese adults (i.e., salt-, fluid-, fat-, and cholesterol-intake behaviours) because of their background and cultural preferences [8] [10]. Because a central concept in self-management is self-efficacy [11], the self-management program was developed by the authors based on Bandura's self-efficacy theory [11], and the four resources of self-efficacy were incorporated to emphasize participants' knowledge, skill, and responsibility in managing their nutritional health.

### E. Data Collection

Data were collected from participants in face-to-face interviews by trained registered nurses and did not deliver the program. Data were collected at baseline and 12 weeks later. All participants received the routine care, i.e., regular check-ups with physicians at their public health centre, while the intervention group received our self-management program. After the participants signed informed consent, their background information (i.e., age, gender, educational

level [years], marital status, income, living arrangement), nutritional status, nutritional self-efficacy, and health locus of control were collected. Moreover, satisfaction and participants' brief feedback with the program were evaluated at the end of the study.

The 18-item Mini-nutritional assessment (MNA) [12] was used to evaluate nutritional status, which includes anthropometrics assessment, general assessment, dietary assessment, and subjective assessment. A total MNA score was summed all items and the ranges from 0 to 30 [12]. Nutritional self-efficacy was measured by the 16-item Cardiac Diet Self-Efficacy (CDSE) scale [13]. The 16-item of the CDSE are scored from 1 (very little) to 5 (quite a lot), and higher scores represent greater self-efficacy to follow a healthy diet. Health control beliefs were assessed using the 18-item Multidimensional Health Locus of Control (MHLC) scale [14]. Three 6-item subscales of internal health locus of control (IHLC), powerful others health locus of control (PHLC), and chance health locus of control (CHLC) were contained in the MHLC. The satisfaction with the self-management program was measured on five research team-developed items: information on healthy eating and aging, program interveners' support, setting and acting on attainable goals, self-monitoring, the home visit and phone delivery. Responses are recorded on a Likert-type scale from 1 (very little) to 5 (quite a lot).

**F. Ethical Consideration**

This study was approved by the authors' university institutional review board and the public health canters. All older adults were enrolled on a volunteer basis and were informed about the study's protocol verbally. The written informed consent was obtained, with a written copy for a family member. All participants were assured that their anonymity and confidentiality would be preserved and they could drop out of the study at any time.

**G. Data Analysis**

Data was analyzed using the statistical software SPSS 18 (for Windows). Socio-demographic and health characteristics were compared between men and women using independent t-tests or chi-square appropriate to the level of measurement. Nonparametric models were chosen due to the small sample size. For continuous variables (nutritional status, nutritional self-efficacy, and health locus of control) pre-post treatment changes (within groups) were analyzed with the Wilcoxon signed rank test, while differences between groups (male and female) were analyzed with the Mann-Whitney U test. A difference was considered as statistically significant for a p-value .05. Participants' brief feedback for the program were analysed in Chinese using content analysis [15] and translated into English. That is, the brief feedbacks by the participants were read and re-read to identify the important issues regarding this program by study team members.

## III. RESULTS

**A. Participants' characteristics and outcomes at baseline**

The present study was focus on evaluating the gender difference regarding after the dietary self-management program. The study included 20 men and 38 women, respectively. The majority was female (n=38, 66%), married/partnered (n=42, 72.4%), with a mean age of 72.45 years (SD=4.67, range 65-84). Their average educational level was 5.22 years (range=0-14, SD 4.16) (Table 1). Men and women had similar of socio-demographic characteristics and outcomes at baseline, however, married/partnered was more common among men, and more likely to have higher educational level, as compared with women ($p < .05$) (Table 1).

**Table 1. Baseline characteristics and main outcome variables for the male and female (*N*=58)**

| Variable | Total (*N*=58) | Male (*n* = 20) | Female (*n* = 38) | $t/\chi^{2a}$ | *p* |
|---|---|---|---|---|---|
| Age (range=65-84), *M (SD)*, years | 72.45(4.67) | 73.55 (4.10) | 71.87 (4.89) | 1.31 | .20 |
| Married/partnered, *n* (%) | 42(72.4) | 19(95.00) | 23(60.53) | 7.80 | .00 |
| Education (range=0-14), *M (SD)*, years | 5.22(4.16) | 7.55 (4.08) | 4.0 (3.70) | 3.35 | .00 |
| Illiterate, *n* (%) | 12(20.7) | 1(5.00) | 11(28.95) | 4.50 | .03 |
| Income | | | | .35 | .40 |
| Adequate | 12(20.7) | 5(25.00) | 7(18.42) | | |
| Not sure | 45(77.6) | 15(75.00) | 30(78.95) | | |
| Inadequate | 1(0.8) | 0(0.00) | 1(2.63) | | |
| Others in household (range=1-10), *M (SD)*, *n* | 4.09(2.27) | 4.35(2.25) | 3.95(2.30) | 0.64 | .53 |
| Self-rated health status, *n* (%) | | | | 0.28 | .20 |
| Good | 30(51.7) | 9(45.00) | 23(60.53) | | |
| Fair | 28(48.3) | 11(55.00) | 15(39.47) | | |
| Food prepare, *n* (%) | | | | 18.07 | .00 |

| Variable | Total (*N*=58) | Male (*n* = 20) | Female (*n* = 38) | $t/\chi^{2a}$ | *p* |
|---|---|---|---|---|---|
| Self | 25(43.1) | 1(5.00) | 24(63.16) | | |
| Others | 33(56.9) | 19(95.00) | 14(36.84) | | |
| Previous diet education/counseling, *n* (%) | | | | 0.06 | .52 |
| Yes | 36(62.1) | 12(60.00) | 24(63.16) | | |
| No | 22(37.9) | 8(40.00) | 14(36.84) | | |
| Number of chronic diseases (range=0-3), *M (SD)* | 1.28(0.74) | 1.15(0.88) | 1.34(0.67) | -0.93 | .36 |
| MNA score (range=22-30), *M (SD)* | 26.86(1.33) | 26.95(1.27) | 26.82(1.38) | 0.36 | .72 |
| Nutritional self-efficacy (range=51-75), *M (SD)* | 66.43(5.30) | 66.85(5.91) | 66.21(5.02) | 0.43 | .67 |
| Health locus of control, *M (SD)* | | | | | |
| Internal (range=17-30) | 21.62(3.30) | 21.50(3.20) | 21.68(3.47) | -0.20 | .84 |
| Chance (range=10-19) | 15.05(2.97) | 14.95(2.93) | 15.11(3.03) | -0.19 | .85 |
| Powerful others (range=12-25) | 20.81(2.00) | 21.20(1.58) | 20.61(2.19) | 1.08 | .29 |

*Note.* MNA: Mini-Nutritional assessment.

**B. Effect of the Program between Male and Female**

Table 2 presents the absolute change in the main outcomes from baseline to 12 weeks of the male and female using Wilcoxon signed rank test. The nutritional intervention produced significant improvement in nutritional self-efficacy for both men (z=-3.92, p=.00) and women (z=-4.64, p=.00), and the IHLC was significant enhance only in men (z=-3.43, p=.00). We compared the main outcomes in the end of 12 weeks after the intervention between men and women using Mann-Whitney U tests. Men were better than women at nutritional status regarding MNA score (z=-2.08, p=.04), IHLC (z=-3.09, p=.00), and program satisfaction (z=-2.28, p=.02).

**Table 2. Comparison the effects of within and between group of male (*n* = 20) and female (*n* = 38) at baseline and 12 weeks.**

| Variable | Baseline M (SD) | Posttest M (SD) | Wilcoxon signed rank test z | p | Mann-Whitney *U* test z | p |
|---|---|---|---|---|---|---|
| MNA score | | | | | -2.08 | .04 |
| Male | 26.95(1.27) | 27.50(1.15) | -2.00 | .05 | | |
| Female | 26.82(1.38) | 26.59(1.61) | -0.98 | .33 | | |
| Nutritional self-efficacy | | | | | -.56 | .58 |
| Male | 66.85(5.91) | 68.05(5.19) | -3.92 | .00 | | |
| Female | 66.21(5.02) | 67.50(4.37) | -4.64 | .00 | | |
| Health locus of control | | | | | | |
| Internal | | | | | -3.09 | .00 |
| Male | 21.50(3.20) | 23.35(2.18) | -3.43 | .00 | | |
| Female | 21.68(3.47) | 21.58(3.02) | -0.32 | .75 | | |
| Chance | | | | | -.70 | .49 |
| Male | 14.95(2.93) | 14.70(2.76) | -0.78 | .44 | | |
| Female | 15.11(3.03) | 15.01(3.14) | -0.05 | .96 | | |
| Powerful others | | | | | -.62 | .53 |
| Male | 21.20(1.58) | 21.25(1.48) | -0.28 | .78 | | |
| Female | 20.61(2.19) | 20.79(1.60) | -1.04 | .30 | | |
| Programme satisfaction | | | | | -2.28 | .02 |
| Male | - | 17.60 (1.45) | - | - | | |
| Female | - | 14.53 (3.39) | - | - | | |

*Note.* MNA: Mini-Nutritional assessment; Wilcoxon signed rank test: analyzed the pre-post treatment changes (within groups); Mann-Whitney *U* test: analyzed the differences between groups (male and female) at 12 weeks.

**C. Brief Feedback between Male and Female**

A brief feedback regarding the intervention was collected at the end of the program. Of the 20 male participants, only 6 older male adults (30%) gave us brief comments regarding the program. Two old men gave us a specific feedback such as "May I have more self-monitoring sheet and I can record my water intake every day?" and "great, I will talk to my daughter in law to prepare the food that you suggested…" Compare to male part, female older adults were more talkative. We recruited 38 female older adults and 22 participants provided their feedback in the end of the

program (58%). Most of female older adults like to share their life trivia, for example, 6 old female keep saying they have how many grandchildren, how good they are, what job they have…., and 3 older women start to complain their daughter in law. However, we also received some of older female gave us their valuable feedback. One 70 years old woman said "Because we were getting old, so we need your help," and another said "I like this video because I can practice in my home." Alarmingly, female tend to hold more passive nutritional behaviour. For example, some of female just keep saying that "yes, yes, yes, of course, I know how to cook…." A 80 years older woman hold doctor oriented and keep saying how important of follow the doctor's rule and said "please tell my doctor I will do my best to eat healthy…" Moreover, female older adults care about how to fit their family eating rule and hesitate to follow the program, 2 people said "I need to cook for my family and they like the strong flavour, so, I cannot just consider for myself." And another woman provided a similar opinion "Oh Oh! my husband will not eat this way…"

## DISCUSSION

This study may have important implications for health care professionals as well as future research efforts because this is the first study that has demonstrated possible gender differences in response to a nutritional program in Chinese community-dwelling older adults. We observed gender-specific patterns in the outcomes such as nutritional status, health locus of control, and program satisfaction. The results echoed with [16] they conducted a research in community to test a nutritional program and found that male older adults had better outcomes than female. The analyzed by [17] may apply the reason that men are more inclined to commit to a program if they feel it is benefit to them, and hence men have assessed and evaluated the evidence and made a commitment, they appear to achieve better results in a shorter time than women [7].

The gender difference may relate to education level. From table 1 show that male has higher educational level and low illiterate rate than their counterpart. Older adults with low educational level have more difficulty managing their health problems, and more likely to be malnourished [4]. Because of difficulty reading and understanding written information, and therefore lead to have poor nutritional outcomes [18]. One the other hand, older people with higher levels of education tend to practice healthy behavior [19] than do people with a low level of education.

The study has several important limitations. First, our sample is rather limited with 38 female and 20 male and the generalizability of this study needs to be caution. Second, the data based on self-reporting could lead measurement error and recall bias, which may have prevented us from accurately estimating the association between the program and the nutritional related outcomes. Further investigation is needed whether participants' self-report of nutritional related outcomes, and specifically assess participants' healthy eating behaviours using a scale for older adults. Finally, we only reported brief feedback from our participants; it may be not enough to explore the gender-specific difference deeply regarding the experience of receive a nutritional intervention. A qualitative research, for example, might be interesting in identifying the gap men and women experience between the changes regarding intervention program.

## CONCLUSION

The male and female older adults hold eating behaviour in different way. We hoped to contribute to existing research in four ways. Firstly, the nutritional intervention should consider components of gender difference, and more research needs to be undertaken to establish how best to meet the different needs of male and female participants. Second, the study findings suggest that we should pay attention to female older adults because they tend to have more passive nutritional attitude, more depend on doctor's opinion, and difficult to change their health behavior. Third, we need to apply different program for men and women. For example, female older adults need a trust relationship with health care providers, have more patience, and the program should be easy and practical. On the other hand, male older adults preferred more prescriptive regime, accessibility of health information, and concrete healthy eating goals. Lastly, future randomized controlled studies are needed to further investigate the possibility of gender differences in this population.

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