

A health promotion programme in Adventist and non-Adventist women based on Pender's model: A pilot study

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KEYWORDS

Health promotion;
Health education;
Public health;
Lifestyle;
Behaviour;
Pender's model;
Chile

Summary Objective: In the last decades, the epidemiological and demographic transition in Chile has resulted in a considerable increase in diet-related non-communicable chronic diseases. The aim of this study was to determine the impact of a health promotion programme (HPP) on behaviour in terms of the dimensions of the health-promoting lifestyle profile (HPLP) based on Pender's model. Pender based his research on the development of a model that explains, predicts and modifies forms of behaviour that promote health; an HPP based on this model may achieve positive changes that promote a healthy lifestyle.

Study design: This was a comparative study and the participants were Seventh-Day Adventist Church women (SDAW) and non-Seventh-Day Adventist Church women (NSDAW) aged 20-45 years from the urban area of Villarrica, Ninth Region of Chile. From a population of 300 women (150 SDAW and 150 NSDAW), a random sample of 18 SDAW and 18 NSDAW was chosen. Both groups were comparable in age and socio-economic status. An HPP was undertaken for both groups between April and September 2002. The response rate was 100%.

Methods: The overall score and the scores for the six dimensions of the HPLP (self-actualization, health responsibility, exercise, nutrition, interpersonal support and stress management) were measured in the pre- and post-test periods. Statistical analysis was performed using the Sign test and Wilcoxon's test. Data were processed using the statistical analysis system.

Results: In both groups, the median scores increased significantly between the pre- and post-test periods for the overall HPLP score and the scores of the six dimensions. When comparing the median scores in SDAW with NSDAW, only the score for nutrition

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was significantly higher in SDAW than NSDAW in both the pre-test ($P < 0.0001$) and post-test ($P < 0.0005$) periods.

Conclusions: These findings demonstrate that an HPP based on Pender's model improves behaviour related to a health-promoting lifestyle in both groups, but more so for the NASDW.

Introduction

Improving and protecting the health of the population has always been a priority. To attain this, different approaches have been tried to organize health care and to obtain the necessary impact. Initially, models of health care focused mainly on strategies aimed at recovering health; at later stages, more attention was given to strategies oriented towards prevention of illnesses and health promotion. The need to change the focus of health care derives from demographic, epidemiological, socio-economic, communicational and life changes that populations have experienced, and are the result of the recognition of risk factors that modify health needs.¹

Health promotion is focused on the potential development of the individual, as well as that of his/her family, the community, society and the environment. In other words, on the physical, interpersonal and economic circumstances in which individuals live. It is a proactive approach to health that includes the development and increase of resources, and the fostering of resilience promotion to obtain the optimal functioning of human beings.^{2,3}

Comparisons of diet and disease rates between Adventists and non-Adventists, and prospective cohort studies among Adventists have made an important contribution to our understanding of nutrition and health. Findings from several authors have indicated that vegetarian nutrition provides a special opportunity to reflect on the contributions of studies among this group, and to evaluate the effects of diets based on these principles on questions that remain unanswered and may be addressed by further research.⁴

The Seventh-Day Adventist Church prescribes a lifestyle based on eight health-related concepts. These include the need for a diet rich in fruits, vegetables and wholegrains which provides a high dietary fibre, low calorie, low animal fat intake, divided into three meals; the need for adequate sleep and rest, including changes of activities on weekends; regular exercising in areas free of pollution; access to sunlight every day for proper

vitamin D formation in the skin; intake of adequate volumes of potable water; and the need for temperance. The Seventh-Day Adventist community also considers that their religious beliefs and practice contribute to their wellbeing. However, not every adherent follows all of these principles strictly. It is worth noting that the model proposed by Pender allows the evaluation of health-promoting forms of behaviour, most of which coincide with those that form the basis of the beliefs of the Seventh-Day Adventists.⁵

The epidemiological profile of the population from developed and developing countries has changed. Although undernutrition remains the most relevant nutritional problem in developing countries, the epidemiological transition towards nutritional problems due to excess is becoming similar to the problems in developed countries in many developing countries.^{6,7} Over the last few decades, a major demographic and epidemiological transition has taken place in Chile, represented by the considerable increase in diet-related non-communicable chronic diseases (atherosclerosis and its consequences, obesity, diabetes, hypertension and cancer).⁷ The strategy of the World Health Organization (WHO) on diet, physical exercise and health focuses on the main factors contributing to the growing load represented by chronic, non-transmissible diseases, the most frequent being obesity-related conditions such as cardiovascular diseases, type II diabetes and cancer. This strategy also emphasizes the need to limit the intake of animal fats, trans fatty acids, salt and simple sugars, and proposes increased consumption of fruits and vegetables and increased physical activity.⁸ In this respect, countries have launched sustained national efforts to promote healthy diets and lifestyles based on WHO recommendations and considering the high prevalence of adult cardiovascular disease.⁸ The WHO recognized that schools play an important role in preventing chronic nutritional diseases through education. In this way, schools may help to improve the health of students and adults because children transmit these messages to their parents.⁹ The FAO/WHO have emphasized that improvement in knowledge about

food and nutrition by children and their parents contributes to improvement in the patterns of behaviour of families in relation to these aspects, and in areas such as nutritional status, nutrition practices and physical activity with the aim of preventing diet-related non-communicable chronic diseases.¹⁰ In this context, the findings of several authors support the need for more education programmes focused on the prevention of cardiovascular diseases, obesity, diabetes and cancer, especially for those living in poverty.¹¹⁻²⁵

In order to improve the quality of life of the population, the WHO has stated that health promotion is the fundamental strategy in primary care. This implies changes in behaviour and the adoption of patterns that promote good health. However, in order to obtain the required behavioural changes, it is necessary to stimulate a perceptual-cognitive process that emphasizes real motivations to change behaviour.^{9,10}

In this way and considering that women play a fundamental role in the development of values, attitudes and behaviour that decrease risk factors, a healthy life school for women promoting the self-care of health using Pender's health promotion model can be useful.² Pender based his research on the Social Cognitive Theory of Bandura and the Value Expectancy Theory, which resulted in the development of a model that explains, predicts and modifies forms of behaviour that promote health.³

Health-promoting behaviour, integrated to a healthy lifestyle, allows improvement of health and generation of a better quality of life at any stage of development.² The factors of health-promoting behaviour proposed by Pender and which have been considered in the intervention and evaluation of the present results are: self-actualization, health responsibility, exercise, nutrition, interpersonal support and stress management.²

It is recognized that Seventh-Day Adventists have a healthier lifestyle than the general population.^{4,26-34} For this reason, the aim of this study was to determine the impact of a health promotion programme (HPP) on the behaviour of Seventh-Day Adventist Church women (SDAW) and non-Seventh-Day Adventist Church women (NSDAW), related to the abovementioned health-promoting lifestyle profile (HPLP) based on Pender's model.

Methods

Population and sample selection

The study was performed in Villarrica County, Ninth Region of Chile, 87 km from Temuco City.

The estimated total population in 2002 was 45,531, distributed among urban (67.8%) and rural (32.2%) areas.³⁵ A considerable increase in diet-related non-communicable chronic diseases, such as coronary disease, diabetes, obesity, hypertension and cancer, especially gastric cancer, has been detected in Villarrica County. These diseases are related to lifestyle and constitute the main health problem in adults aged 20-65 years; they represent two-thirds of the mortality in this age group.

All homes from the urban seat of Villarrica County, Temuco were included in a census in order to determine the total number of women living in the area and their socio-economic data. The population of 300 subjects comprised all the SDAW ($n=150$) and NSDAW ($n=150$) from the urban seat of Villarrica County, Temuco, aged 20-45 years. SDAW and NSDAW were selected in order to compare the healthy lifestyle of the former group with the common lifestyle of the latter group. A random sample of 18 SDAW and 18 NSDAW was chosen and both groups participated in an HPP. The groups were comparable as all of the women were housekeepers, responsible for child care and food preparation, they belonged to a similar socio-economic stratum (SES) (middle-low SES) and had comparable levels of schooling (incomplete high school). The number of women selected in each group of the sample (18 women) enabled performance of a pilot study that could be applied later to the general population through the Ministry of Health. A comparative study was carried out between the two groups in order to demonstrate the effectiveness of the HPP. This study was approved by the Committee on Ethics in Studies in Humans of the School of Public Health, Loma Linda University, California, USA. The subjects' consent was obtained according to the Declaration of Helsinki.³⁶

Socio-economic stratum

The SES was evaluated in both groups of the sample applying the modified Graffar's method adapted for the Chilean urban population, which considered items such as schooling, job held by the head of the household, and characteristics of the house (building materials, ownership status, water supply, sewerage and ownership of durable goods).³⁷ This scale classifies populations into six SES groups: 1=high; 2=medium-high; 3=medium; 4=medium-low; 5=low and 6=extreme poverty.

Study instrument

The instrument applied to measure the health-promoting lifestyle was based on the HPLP of Pender's model that was validated for a population of Spanish background.³⁸⁻⁴⁰ The Spanish version had been administered to a diverse but predominantly Mexican-American group of 485 individuals residing in metropolitan and surrounding rural areas of the USA. In a factor analysis of the principal components, all but one item loaded significantly on six factors similar to those isolated previously during the psychometric assessment of the English language version.³⁸ Those six dimensions comprise the HPLP subscales of self-actualization, health responsibility, exercise, nutrition, interpersonal support and stress management. The six factors explained 45.9% of the variance in the 48 items measured. Second-order factor analysis yielded a single factor, interpreted as a health-promoting lifestyle.³⁸ The alpha reliability coefficient for the total scale was 0.93 and 2-week test-retest reliability was 0.86; alpha coefficients for the subscales ranged from 0.70 to 0.87.³⁸⁻⁴⁰ The distribution of the 48 items in the six dimensions was as follows: self-actualization (13 items), health responsibility (10 items), exercise (five items), nutrition (six items), interpersonal support (seven items) and stress management (seven items). Factor analysis isolated six dimensions: self-actualization, health responsibility, exercise, nutrition, interpersonal support and stress management. Scoring in each item was expressed in an ordinal scale: never (1), sometimes (2), frequently (3) and always (4).³⁸⁻⁴⁰ The overall HPLP score is expressed as the mean of the responses obtained in the 48 items. In each of the different subscales, the mean score was calculated in the same way considering the maximum number of items in each of them. This instrument will enable researchers to investigate patterns and determinants of a health-promoting lifestyle, as well as the effects of interventions to alter lifestyle.³⁸⁻⁴⁰ The instrument was applied through an individual interview.

Methodological design of the HPP

Table 1 shows the methodological design stages of the HPP, including a diagnostic (pre-test) period, an educational intervention period and an evaluation (post-test) period.

Pre-test period

The aim of this period was to evaluate the basic knowledge about health-promoting lifestyles, with the instrument based on the HPLP of Pender's

model, in both SDAW ($n=18$) and NSDAW ($n=18$) and was applied in one session.³⁸ Likewise, the SES and demographic characteristics of the women of both groups were determined.

Educational intervention period

The aim of the educational intervention period was to obtain positive changes of behaviour in the six aspects of the HPLP in both groups of women.³⁸ The HPP was applied over 3 months, with a total of 33 educational sessions, for both SDAW and NSDAW and consisted of a cognitive-perceptual programme in which the benefits of pure air, rest, sunlight, water, stress management, self-care in health and nutrition were discussed. Workshops on healthy cuisine were run for 2 h/week for a total of 13 weeks, during which women practiced culinary recipes. After the theoretical classes about the benefits of exercise, women attended 1-h aerobic gymnastic sessions twice a week for a total of 20 sessions.

Post-test period

The post-test period began 3 months after the HPP was completed. As in the pre-test period, the HPLP of Pender's model was administered to both SDAW ($n=18$) and NSDAW ($n=18$) to evaluate changes in the overall score as well as in behaviour related to the six subscales.³⁸ The response rate was 100% during the pre- and post-test periods.

Statistical analysis

Results are expressed as median, mode, range and quartiles.⁴¹ Data were processed using the statistical analysis system (SAS) package.⁴² Statistical analysis was performed using the Sign test (PROC UNIVARIATE) to determine significant differences in each dimension of the HPLP, separately for each group, during the pre- and post-test periods. Wilcoxon's test (PROC NPAR1WAY) was used to establish significant differences in each dimension of the HPLP to compare NSDAW with SDAW during the pre- and post-test periods.^{41,42}

Results

Table 2 shows the pre- and post-test scores in the HPLP dimensions in NSDAW and SDAW. Median scores in the HPLP increased significantly between the pre- and the post-test periods in terms of the overall score and for the six dimensions. In both groups, scores

Table 1 Methodological design stages.

Period	Specific objectives	Duration April-June 2002	Learning situation or activities	Didactic materials or audio-visual mass media	Evaluation
Pre-test (SDAW and NSDAW)	To determine the behaviour related to the six dimensions of the HPLP based on Pender's model: self- actualization, health responsibility, exercise, nutrition, interpersonal support and stress management	1 Session	To apply the instrument based on Pender's model structured on 48 items	Test	Diagnostic
Health pro- motion programme (SDAW and NSDAW)	To achieve positive behaviour changes in the six dimensions of the HPLP based on Pender's model: self- actualization, health responsibility, exercise, nutrition, interpersonal support and stress management	1 Session 1 Session 1 Session 20 Sessions 13 Sessions 1 Session 1 Session 1 Session 1 Session 1 Session 1 Session 1 Session 1 Session 1 Session 1 Session 1 Session	Educational sessions, Benefits of: Pure air Rest Sunlight Exercise Kitchen practices Water Temperance Stress management Health responsibility nutrition Proteins Carbohydrates Fats and oils Vitamins Minerals Dietary fibre	Natural foods, datashow, slides, videotapes, educational stickers, charts, displays, posters, films, aerobic practices, kitchen elements	Formative
Post-test (SDAW and NSDAW)	To determine the behaviour related to the six dimensions of the HPLP based on Pender's model: self- actualization, health responsibility, exercise, nutrition, interpersonal support and stress management	1 Session	To apply the instrument based on Pender's model structured on 48 items	Test	Summative

SDAW, Seventh-Day Adventist women ($n=18$); NSDAW, non-Seventh-Day Adventist women ($n=18$); HPLP, health-promoting lifestyle profile.

increased significantly in all six dimensions ($P < 0.0001$ for all changes in NSDAW). Figs. 1 and 2 show median scores \pm ranges for the overall results of the HPLP and the six dimensions, respectively, in NSDAW and SDAW in the pre- and post-test periods. Both groups experienced positive, significant changes in all dimensions of the HPLP.

Table 3 summarizes the Wilcoxon's test values for the comparison of NSDAW with SDAW scores in

the HPLP dimensions during the pre- and post-test periods. With the exception of nutrition, no significant differences were observed in the other factors of the HPLP in either the pre- or the post-test periods. SDAW manifested significantly higher scores in the nutrition dimension in the pre-test ($P < 0.0001$) as well as in the post-test period ($P < 0.0005$). Fig. 3 shows the median overall scores and the scores of the six dimensions for NSDAW and

Table 2 Pre- and post-test scores in the Health-Promoting Lifestyle Profile (HPLP) and the six dimensions in Seventh-Day Adventist women (SDAW) and non-Seventh-Day Adventist women (NSDAW).

Groups and HPLP dimensions	Scores										Pr ≥ M (Sign)
	Pre-test					Post-test					
	Md	Mo	Q1	Q3	Q4	Md	Mo	Q1	Q3	Q4	
SDAW (n=18)											
HPLP	2.8	2.6	2.6	3.1	3.4	3.4	3.4	3.1	3.6	3.7	0.0001
Self-actualization	3.3	3.4	2.7	3.5	4.0	3.8	3.8	3.2	3.9	4.0	0.0001
Health responsibility	2.5	2.8	1.8	2.9	3.5	3.2	2.6	2.6	3.4	3.7	0.0001
Exercise	2.0	1.8	1.8	2.4	3.4	2.9	3.0	2.2	3.2	4.0	0.0042
Nutrition	3.3	3.2	3.2	3.8	4.0	3.8	4.0	3.5	4.0	4.0	0.0005
Interpersonal support	3.0	3.0	2.6	3.4	3.9	3.7	3.7	3.0	3.9	4.0	0.0001
Stress management	2.5	2.0	2.0	2.9	3.4	3.1	3.1	3.0	3.6	3.9	0.0001
NSDAW (n=18)											
HPLP	2.6	2.4	2.4	2.9	3.4	3.1	3.1	3.1	3.5	3.6	0.0001
Self-actualization	3.2	3.1	2.7	3.5	3.8	3.7	3.8	3.5	3.8	3.9	0.0001
Health responsibility	1.9	1.9	1.7	2.4	3.2	2.8	2.8	2.5	3.3	3.6	0.0001
Exercise	2.2	2.6	1.8	2.6	3.4	3.0	3.2	2.2	3.2	4.0	0.0001
Nutrition	2.7	2.7	2.3	3.0	3.3	3.3	3.3	3.0	3.5	4.0	0.0001
Interpersonal support	3.0	2.6	2.6	3.4	4.0	3.5	3.1	3.1	3.9	4.0	0.0001
Stress management	2.3	2.3	2.0	2.4	3.3	3.0	2.7	2.7	3.3	3.7	0.0001

SDAW during the pre- and post-test periods. In the HPLP, the median scores of NSDAW and SDAW increased by 0.5 and 0.6 points, respectively. With the exception of exercise, SDAW scored higher in all dimensions of the HPLP in both periods. However, in the post-test period, the median SDAW score increased by 0.9 points, compared with 0.8 points for NSDAW for exercise. In this dimension, NSDAW scored higher than SDAW in the pre- and post-test periods. In both periods, the lowest median score was observed for health responsibility in NSDAW. In the post-test period, NSDAW exhibited slightly higher changes in scores for health responsibility, nutrition and stress management, while SDAW scored higher in health-promoting lifestyle, exercise and interpersonal support. For self-actualization, changes in the post-test period were similar for both groups. SDAW manifested significantly higher median scores in nutrition in the pre-test

as well as in the post-test period, as shown in Table 3.

Discussion

Health promotion is universally recognized as a high yield cost-benefit strategy to improve people’s health; when the subject is the family or the community, it has an even higher value.^{8,43} In these situations, the family as well as the community are responsible for the development of future generations because it is in this context that the values, attitudes and behaviour related to health are transmitted, representing healthy family lifestyles capable of decreasing high-risk situations for diet-related non-communicable chronic diseases.⁴⁴⁻⁴⁶

An analysis of the median scores indicates that SDAW have a higher frequency of health-promoting activities than NSDAW, as well as higher scores in all the other dimensions, with the exception of physical exercise where NSDAW scored higher from the beginning. This may be due to the philosophy of life of these women, and to the education they receive from the Seventh-Day Adventist Church, independently of their socio-economical level, because the concept of integral health exists within their beliefs.

In self-actualization, the SDAW showed higher median scores due to the various types of activities in which they participate, e.g. social assistance.

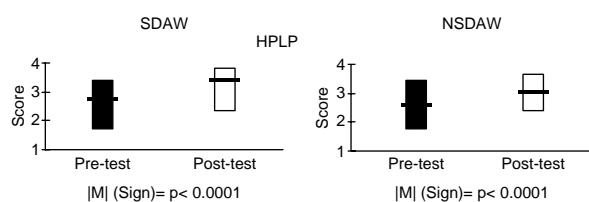


Figure 1 Median scores and ranges in the overall results of the health-promoting lifestyle profile (HPLP) of Pender’s model in the pre- and post-test periods. SDAW, Seventh-Day Adventist women (n=18); NSDAW, non-Seventh-Day Adventist women (n=18).

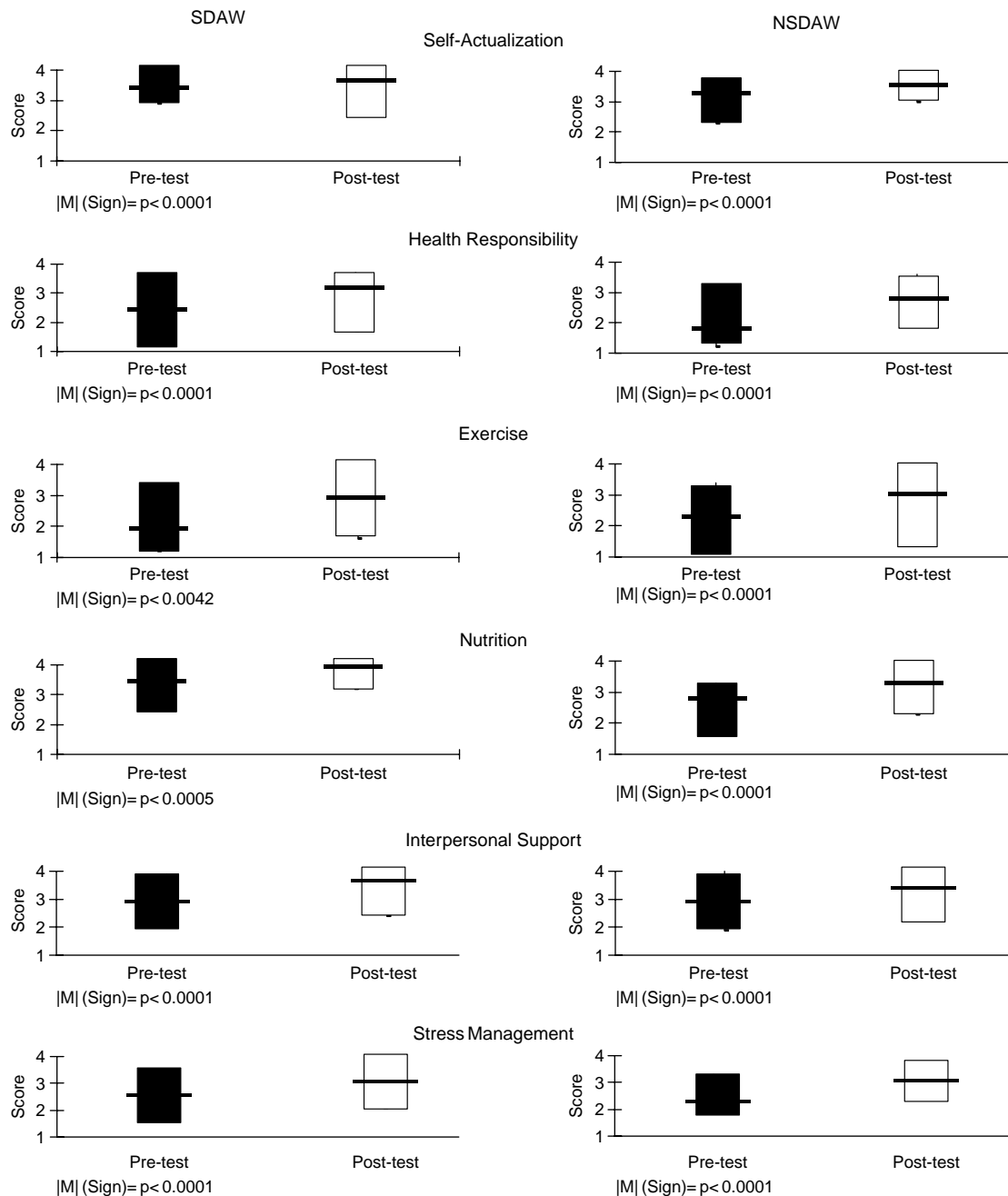


Figure 2 Median scores and ranges in the six dimensions of the health-promoting lifestyle profile of Pender's model in the pre- and post-test periods. SDAW, Seventh-Day Adventist women ($n=18$); NSDAW, non-Seventh-Day Adventist women ($n=18$).

In health responsibility, the median scores of the SDAW were initially higher and remained so throughout the follow-up. One explanation for this is the emphasis on self-care imparted as part of their religious beliefs. The NSDAW only had knowledge on preventive health and healthy behaviour imparted by the Ministry of Health.

In physical exercise, the lower median scores of the SDAW compared with the NSDAW were probably due to their more sedentary lifestyle and to the fact

that, in spite of their knowledge about health care, they have not recognized its real importance. The NSDAW started with higher scores in physical exercise because, prior to participation in the study, they were already in a system of programmed physical activity two to three times a week.

In the nutrition-related aspects, the median scores showed that the SDAW have a healthier diet; many of them are ovo-lacto-vegetarian, and

Table 3 Wilcoxon’s test values for comparison of the scores of Seventh-Day Adventist women (SDAW, *n*=18) with those of non-Seventh-Day Adventist women (NSDAW, *n*=18) for the health-promoting lifestyle profile (HPLP) and the six dimensions during the pre- and post-test periods.

HPLP dimensions	Pre-test	Post-test
HPLP	Z=1.33 NS	Z=1.33 NS
Self-actualization	Z=0.00 NS	Z=0.40 NS
Health responsibility	Z=1.30 NS	Z=0.92 NS
Exercise	Z=-0.40 NS	Z=-0.41 NS
Nutrition	Z=4.04 <i>P</i> <0.0001	Z=3.48 <i>P</i> <0.0005
Interpersonal support	Z=-0.70 NS	Z=0.19 NS
Stress management	Z=0.86 NS	Z=1.44 NS

consume a diet that is low in fat and calories, and rich in dietary fibre. It is possible that with their previous knowledge and because of the educational intervention, they experienced

favourable changes in their behaviour. In the case of the NSDAW, it seems that the HPP was beneficial since, although they started with lower scores than their SDAW peers, they reached the basal level where the SDAW started after a short period of time.

As for interpersonal support, both groups started at the same level; however, the median scores attained by the SDAW suggest that there was a greater change in behaviour as a result of the intervention. This may be due to the support they find in their community and the emotional relationships developed there.

In stress management, the median scores showed that the SDAW handled stress better than the NSDAW after the educational intervention which taught them to control stress with the support of their peers.

These results confirm the importance of an HPP for a healthy lifestyle for both SDAW and NASDW. Studies carried out in Chile and in other countries

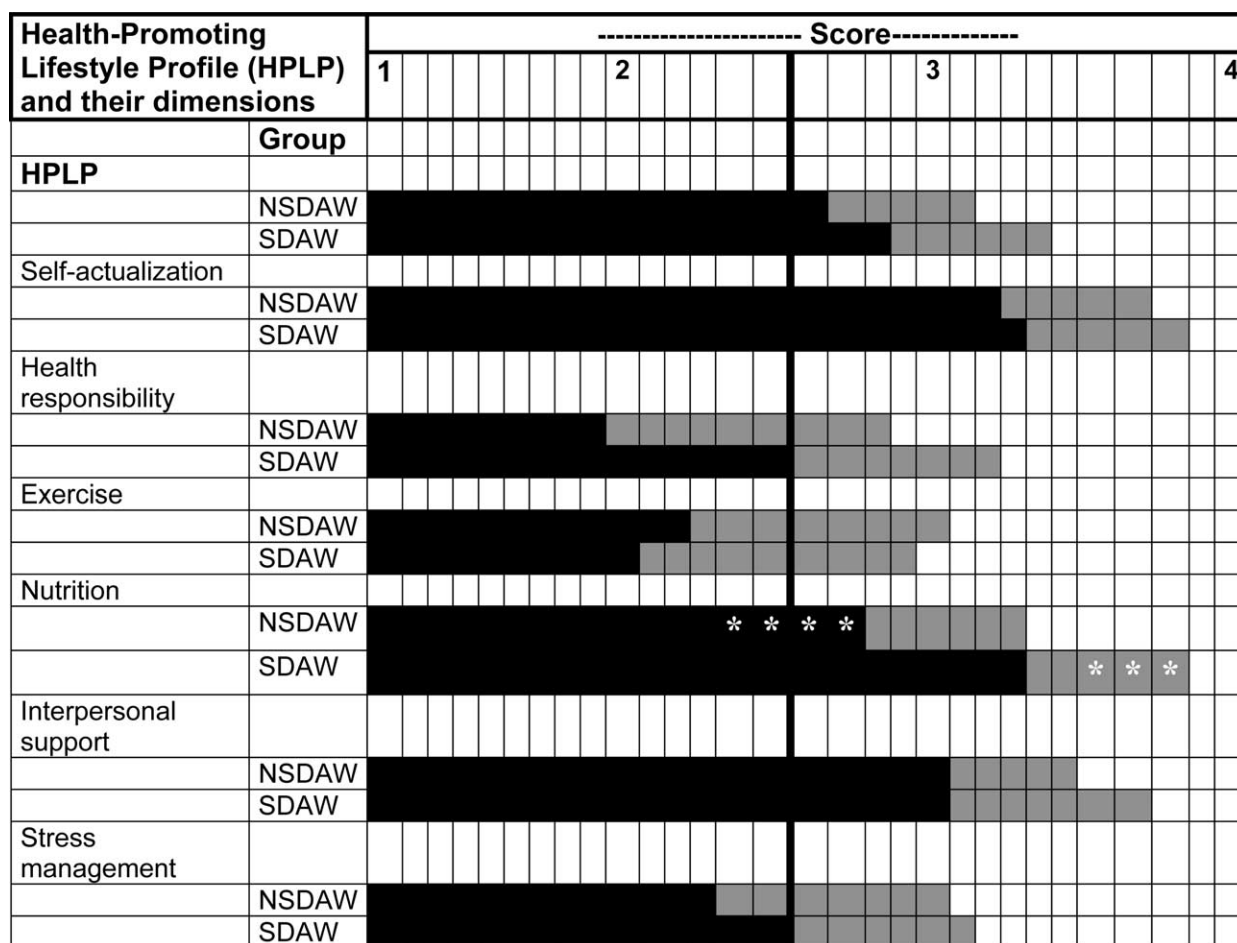


Figure 3 Median scores of non-Seventh-Day Adventist women (NSDAW, *n*=18) and Seventh-Day Adventist women (SDAW, *n*=18) for the Health-Promoting Lifestyle Profile (HPLP) and the six dimensions during the pre- (■) and post-test periods (▒). Wilcoxon’s test was used for the comparison of SDAW and NSDAW scores during the pre- and post-test periods. *****P*<0.0001; ****P*<0.0005.

in different ethnic groups have emphasized the benefits represented by the implementation of programmes that promote health.^{1,6-25,47} SDAW scored higher than NSDAW because the former follow a lifestyle that is healthier than that of the general population.^{4,26-34} However, when comparing the median scores of both groups in the pre- and post-test periods, SDAW only manifested higher scores than their NASDW peers in nutrition. This could indicate that the HPP was useful for both groups, but more so for the NASDW.

SDAW manifested characteristics, individual experiences, knowledge and affective feelings related to specific behaviours which constitute factors that promote a healthy lifestyle. These behaviours have been acquired from their family and religious practices, and developed before commencement of the HPP. Habit formation starts at an early age and habits are intrinsic motivations for women bringing up their children. The HPP represents a positive extrinsic reinforcement of these behaviours. In this way, despite the difficulties inherent to the stimulation of changes in behaviour and practices related to resistance to change, investment in time and fear of not proving capable of modifying conduct, both groups showed improvements. Apparently, both groups understood that the possible benefits exceeded the efforts required by this programme, as none of the women abandoned it and strong links were established with their peers and with the activities developed. The outcome was that HPP had a positive impact in both SDAW and NSDAW.

In conclusion, an educational programme for health promotion based on the Pender model could be of great importance and represent a useful tool for improvement of the quality of life. Despite the small sample, the programme allowed stimulation of the dimensions showed by Pender, which constitute an integral programme to promote patterns of behaviour beneficial to health. It is possible that implementing the programme in childhood would promote a healthier lifestyle at an earlier age, and thus contribute to the prevention of diet-related non-communicable chronic diseases in adult life.

Acknowledgements

The authors grateful acknowledge Dr Oscar Brunser for helpful comments and suggestions, and Ms Nora S. Diaz and Ms Bárbara D. Leyton from the

University of Chile, Institute of Nutrition and Food Technology for statistical assistance.

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