



UNIVERSITI PUTRA MALAYSIA

***EFFECTIVENESS OF HEALTH EDUCATION INTERVENTION BASED ON
HEALTH BELIEF MODEL AMONG ELDERLY WOMEN
IN URMIA, IRAN***

JAMILEH AMIRZADEH IRANAGH

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**Thesis Submitted to the School of Graduates Studies, Universiti Putra Malaysia, in
Fulfillment of the Requirements for the Degree of Doctor of Philosophy**

July 2015

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DEDICATION

This thesis is dedicated to:

My parents, whom I owe everything I having my life

My husband, Mohammad Reza, for his remarkable patience, unwavering love, and endless support

My lovely daughter, Yeganeh for her understanding

My sisters and brothers for their support and encouragement



Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfillment of the requirement for the Degree of Doctor of Philosophy

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**Chairman : Hejar Binti Abdul Rahman, M.Com Hlth
Faculty : Institute and Gerontology**

Elderly population is now a challenge that affects developed and developing countries throughout the world. There is symmetry between age increase and the rise in chronic diseases. Non-communicable diseases (NCD's) are strongly influenced by behavioural risk factors including insufficient physical activity, and unhealthy diet, which lead to elevated blood pressure, blood glucose, cholesterol levels, and body weight. So, it is essential to use physical activity and nutrition intervention program to help prevention of NCD's. This study was aimed to evaluate the effectiveness of health education intervention based on the health belief model among elderly women in Urmia, Iran

This randomized control trial was carried out in Urmia city, which was divided to four zones and then randomly assigned to one of four groups. Then from each respective zone one primary health care centre was selected. The population sampled using a stratified, multistage probability cluster sampling design. Two hundred subjects were qualified to participate in this randomized controlled trial designed study. Subjects were randomized into four groups: (1) nutrition intervention, (2) physical activity (3) both nutrition intervention and physical activity (compound) (4) control, to either a three month education program.

First outcome variables were knowledge, performance, and perception of nutrition and physical activity in the elderly women. Second outcome was determination level of fasting blood glucose, lipid profiles and anthropometric parameters before and during intervention program period.

One hundred seventy two subjects with mean age 69.32 (SD=5.345), successfully completed the program duration. Among the 172 elderly women, the adherence rate to the program 82% for the nutrition group, 86% for the compound group, 86% for the physical activity group, and 90% for the control group, totalling 86% of general adherence. Generally, compared to similar intervention programs, the present study,

had an acceptable level of subjects' adherence to the program. Hence, an overall of 14% drop rate in this study showed a lower number than that in other studies.

There were no significant differences in the distributions of all tests scores for the variables between the intervention and control groups prior to the intervention. At the end of the intervention, results of mixed repeated measures analysis of variance revealed a statistical significant difference in knowledge, belief, and performance of nutrition and physical activity, anthropometric parameters, lipid, and glucose between intervention groups and control group across three different measurements, after six months ($p < 0.001$). Although, there was found significant interaction of time by group for all variable scores ($p < 0.001$).

The present study indicated that by the end of the six months intervention, the participants experienced some significant anthropometric changes. It seemed that each of the physical activity or nutrition or compound group led to improvement in the subjects' body mass index, waist circumference, mid-upper arm circumference, and hip circumference. Without any exercise and nutrition in the control group, the participants experienced a slight increase in their anthropometric parameters.

The post-intervention measurements showed significant reduction ($p < 0.001$) in FBS, systolic blood pressure, diastolic blood pressure in physical activity group as compared to other groups. However, comparison of result indicated that improvement in cholesterol, triglyceride, LDL, and increase in HDL in compound group were higher than nutrition alone and physical activity alone ($p < 0.001$).

This study suggests the physical activity and nutrition intervention is effective among the elderly women. Therefore, group-based nutrition and physical activity education could be an alternative solution, as it promotes favourable improvement on the conditions of the elderly with sedentary life style.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

**KEBERKESANAN INTERVENSI PENDIDIKAN KESIHATAN
BERDASARKAN MODEL KEPERCAYAAN KESIHATAN DALAM
KALANGAN WANITA BERUMUR DI URMIA, IRAN**

Oleh

JAMILEH AMIRZADEH IRANAGH

Julai 2015

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Populasi warga tua kini merupakan cabaran yang memberi kesan kepada negara-negara maju dan membangun di seluruh dunia. Terdapat simetri antara peningkatan umur dan peningkatan penyakit-penyakit kronik. Penyakit tidak berjangkit (NCD) adalah dipengaruhi oleh faktor-faktor risiko tingkah laku termasuk aktiviti fizikal yang tidak mencukupi, dan pemakanan yang tidak sihat, yang membawa kepada peningkatan tekanan darah, glukosa darah, tahap kolesterol dan berat badan. Justeru, adalah penting untuk menggunakan program intervensi aktiviti fizikal dan pemakanan untuk membantu pencegahan NCD ini. Kajian ini bertujuan untuk menilai keberkesanan intervensi pendidikan kesihatan berdasarkan model kepercayaan kesihatan dalam kalangan wanita berumur di Urmia, Iran.

Percubaan kawalan rawak ini telah dijalankan di bandar Urmia, yang mana dibahagikan kepada empat zon dan kemudian dibahagikan secara rawak kepada satu daripada empat kumpulan. Kemudian dari setiap zon satu pusat penjagaan kesihatan utama telah dipilih. Populasi sampel adalah menggunakan reka bentuk persampelan kelompok kebarangkalian berstrata, pelbagai peringkat (*stratified, multistage probability cluster sampling design*). Dua ratus subjek layak untuk mengambil bahagian dalam kajian percubaan kawalan rawak ini. Subjek dipecahkan secara rawak kepada empat kumpulan: (1) intervensi pemakanan, (2) aktiviti fizikal (3) kedua-dua intervensi pemakanan dan aktiviti fizikal (kompaun) (4) kawalan, sama ada ke program pendidikan tiga bulan.

Hasil pembolehubah pertama adalah pengetahuan, prestasi, dan persepsi pemakanan dan aktiviti fizikal dalam kalangan wanita berumur. Hasil kedua adalah tahap penentuan glukosa darah, profil lipid dan parameter antropometri apabila berpuasa pada sebelum dan semasa tempoh program intervensi.

Satu ratus tujuh puluh dua subjek dengan min umur 69.32 (SD = 5.345), berjaya menamatkan tempoh program. Antara 172 wanita tua, kadar kepatuhan kepada program adalah 82% bagi kumpulan pemakanan, 86% bagi kumpulan kompaun, 86% bagi kumpulan aktiviti fizikal, dan 90% bagi kumpulan kawalan, bersamaan 86%

kepatuhan umum. Secara umumnya, berbanding program intervensi yang sama, kajian ini mempunyai tahap kepatuhan subjek yang boleh diterima untuk program ini. Oleh itu, kadar penurunan sebanyak 14% dalam kajian ini menunjukkan bilangan yang lebih rendah berbanding dalam kajian lain.

Tiada perbezaan signifikan dalam pengagihan semua markah ujian bagi pembolehubah antara intervensi dan kumpulan kawalan sebelum intervensi. Pada akhir intervensi, keputusan ukuran campuran berulang analisis varians membuktikan bahawa terdapat perbezaan statistik yang signifikan dalam pengetahuan, kepercayaan, dan prestasi pemakanan dan aktiviti fizikal, parameter antropometri, lipid, dan glukosa antara kumpulan intervensi dan kumpulan kawalan merentasi tiga ukuran yang berbeza, selepas enam bulan ($p < 0.001$). Walaupun, ada didapati kesan ketara yang signifikan pada masa oleh kumpulan bagi semua markah pembolehubah ($p < 0.001$).

Kajian ini menunjukkan bahawa pada enam bulan terakhir intervensi, peserta mengalami beberapa perubahan antropometri ketara. Ia kelihatan bahawa setiap aktiviti fizikal atau pemakanan atau kumpulan kompaun membawa kepada peningkatan dalam indeks jisim badan subjek, lilitan pinggang, lilitan pertengahan lengan atas, dan lilitan pinggul. Tanpa sebarang senaman dan pemakanan dalam kumpulan kawalan, peserta mengalami sedikit peningkatan dalam parameter antropometri mereka.

Pengukuran pasca intervensi menunjukkan penurunan yang signifikan ($p < 0.001$) dalam FBS, tekanan darah sistolik, tekanan darah diastolik dalam kumpulan aktiviti fizikal berbanding dengan kumpulan lain. Walau bagaimanapun, perbandingan keputusan menunjukkan bahawa peningkatan dalam kolesterol, trigliserida, LDL, dan peningkatan dalam HDL dalam kumpulan kompaun adalah lebih tinggi daripada pemakanan sahaja dan aktiviti fizikal sahaja ($p < 0.001$).

Kajian ini menunjukkan aktiviti fizikal dan pemakanan adalah intervensi yang berkesan dalam kalangan wanita berumur. Oleh itu, pendidikan pemakanan dan aktiviti fizikal berasaskan kumpulan boleh menjadi penyelesaian alternatif, kerana ia menggalakkan peningkatan yang menggalakkan terhadap keadaan orang tua dengan gaya hidup yang tidak aktif.

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This thesis was submitted to Senate of Universiti Putra Malaysia and has been accepted as fulfillment of the requirement for the degree of Doctoral of Philosophy. The members of the Supervisory Committee were as follows:

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CHAPTER 1

INTRODUCTION

1.1. Background

Elderly above 60 years old make nearly 600 million of the world population and by 2050 the figure will reach about two billion mainly living in developing countries (Shaghi, Babak, & Manzori, 2009). Globally the elderly population that has sharply grown in number due to decline in birth rate, a rise in life expectancy, development of urbanization, high income, higher education, and accessibility to health care (McCutcheon & Pruchno, 2011). In comparison to Western countries, Asia has been the world's fastest-growing region and this strong sustained performance has transformed the region from a group of typical developing countries into one of the three centers of gravity of the world economy, along with the US and EU (Lee, Mason, & Park, 2011). Iranian population like other countries in the world is undergoing aging. At present about eight percent of the population of Iran (about 5.5 million) are over 60 years of age, which will result in old age explosion in 20 years if the same condition persists. The consequence will be an increase by 25-30 percent to the population at the age of above 50 (Heidari & Shahbazi, 2012).

Likewise, there is an increase in the frequency of non-communicable diseases like coronary heart disease, cancer, cerebrovascular diseases, diabetes mellitus, osteoporosis and pulmonary diseases. Most of such chronic diseases are the risk factors as in high blood pressure, smoking, high cholesterol, obesity, physical inactivity and unhealthy diet, (Hosseini-Esfahani, Jessri, Mirmiran, Bastan, & Azizi, 2010). Now these non-communicable diseases are the main causes of death worldwide (Boutayeb, 2006; Lee, Shiroma, Lobelo, Puska, Blair et al., 2012).

Studies presented that chronic diseases highly prevail in old age. which is the main cause of heavy financial, health, and medical costs and disability in the elderly not to mention the fact that these diseases can largely lead to mortality in people over 65 (Salehi, Naajee, & Sargazi, 2012). In this regard, studies conducted in Iran indicate that there is a higher rate of visiting doctors, seeking for medication, and receiving hospitalization services for the elderly rather than for the non-elderly people. The ratio of hospitalization for an elderly person is reportedly 0.4 per year (Asefzadeh & Ghodoosian, 2010). Thus, prevention of and delay in the occurrence of chronic diseases in the elderly are a critical issues in public health (Goetzel, Shechter, Ozminkowski, Stapleton, Lapin et al., 2007) and physical activity and nutrition are determining factors of health of elderly (Oliveira, Fogaca, & Leandro-Merhi, 2009). The modification of nutritional and physical activity behaviours can, to a great extent, help enhance efficiency and independence in the elderly as well as assisting them in controlling the side effects of old age and different medical treatments (Knoops, Groot, Kromhout, Perrin, Moreiras-Varela et al., 2004).

With the help of effective health interventions and advanced treatment of diseases, most European countries have reduced the effect of non-communicable diseases specifically the heart diseases. Of the ten major causes of death in America, if six issues are properly addressed, casualties will be lowered to a great extent. These issues include behaviour, diet, exercise, smoking, use of antihypertensive medication and alcohol usages (Jemal, Siegel, Ward, Hao, Xu et al., 2008). As an effective factor in addressing behaviour, health education at primary health care (PHC) centres contribute significantly to changing behaviour and lowering the burden of non-communicable diseases behaviour (Midhet, Mohaimed, & Sharaf, 2010). Thus, the elderly are expected to be seriously in need of health care resources which will be accompanied by respective expenses being a critical issue, too (Shrivastava, Shrivastava, & Ramasamy, 2013). Therefore, health care providers should boost healthy behaviour for the old population (Barbara Cliff, 2012). It is documented that health-promoting behaviours regarding the condition of the elderly can basically enhance the condition of their health and quality of life (QoL) and hence decreasing the cost of health care (Tw, Is, & Kj, 2006; Dechamps, Diolez, Thiaudière, & et al., 2010). It is possible to improve healthy behaviour through health intervention, and education can give information accordingly. Therefore, education can pave the way for addressing health status in a proper way and help the elderly benefit intervention programs (Grossman, 2004).

With the use of health behaviour theories it will be possible to run health interventions. Among the current theories, one useful one is the Health Belief Model (HBM)(Hanson & Benedict, 2002; Champion & Skinner, 2008), stating that health behaviours are associated with certain beliefs. It says that when people tend to get sick, they try to make certain behavioural changes to stay healthy. That is to say, they begin to believe that the recommended preventive behaviour will be effective, the disease will be severe and the benefits have an advantage over the costs (Hurst & Wham, 2007).

1.2 Problem Statement

There is a close association between aging and chronic diseases. Globally, nearly 45% of women aged above 60 years died as a result of chronic conditions, especially cardiovascular diseases (WHO, 2009)and in Iran, 33% of elderly women died from chronic diseases (Asgari, Aghajani, Haghazali, & Heidarian, 2009).

The epidemic of the chronic diseases related to lifestyle, the intake of high calorie food with sedentary lifestyle can lead to the prevalence of obesity. Iranians use carbonated beverages about 42 liters per person a year. About 40% of Iranians' daily food consumption is more than their requirement. For example, their average use of fat and carbohydrate is 30% and 40% higher than they need (Malekzadeh, Mohamadnejad, Merat, Pourshams, & Etemadi, 2005) that lead to obesity or weight gain. Excess body weight and chronic health problems are closely related to each other. Hence, one study in Iran showed prevalence of overweight/obesity in elderly women in the urban and rural areas was 82.1% and 66.1%, respectively (Maddah & Sharami, 2010). Besides, most Iranian with diabetes mellitus are elderly, one-third of

the older population have diabetes and three-quarter have pre-diabetes (Haghdoost, Rezazadeh-Kermani, Sadghirad, & Baradaran, 2009), as well as,. diabetes and hypertension affected 23.5% and 52% of Iranian elderly women, respectively (Tanjani, Motlagh, Nazar, & Najafi, 2015). So it is important to run a nutrition intervention for behaviour change among elderly people (Eakin, Lawler, Vandelanotte, & Owen, 2007).

Furthermore, WHO has recently announced that the fourth main risk factor worldwide is physical inactivity (Young & Dinan, 2005), which is the most critical risk factors for non-communicable diseases (NCDs). Regular physical activity offers many benefits (Shabani, Nazem, & Puraqayy, 2009; Lee, Jancey, Howat, Burke, Kerr et al., 2011; Giuli, Papa, Mocchegiani, & Marcellini, 2012). Physical activity can prevent NCDs and help to eliminate the risk of the chronic diseases (Chodzko-Zajko, Schwingel, & Chae Hee Park, 2009). In addition, it is documented that as the level of activity decreases, the cost of health care rises (Martinson, Crain, Pronk, O'Connor, & Maciosek, 2003). Unfortunately more than 80% of Iranians are physically inactive (Sheikholeslam, Mohamad, Mohammad, & Vaseghi, 2004) and 38.8% of the elderly spent their leisure time at home alone and 22.5% of the elderly did not participate in any kind of physical activities (Tanjani et al., 2015). People cannot change their detrimental behaviours unless they are instructed about the effect of their lifestyle on their health (Bandura, 2007; Resnick, Orwig, D'Adamo, Yu-Yahiro, Hawkes et al., 2007). Therefore, it is important to explain the ways of improving the quality of life through health, nutrition and physical activity education (Malekafzali, Baradaran-Eftekhari, Hejazi, & Khojasteh, 2010). Education is important because of its behavioural impact and for nutrition and physical activity education, HBM can enhance the impact of educational programs (Lynch & Happell, 2008). As a result, it is of high value to offer the elderly a nutrition and physical activity intervention.

1.3 Significance of the Study

This research attempts to make an investigation into the impact of health education on elderly women's behaviour. Health education interventions aims to give people the information and/or skills needed for understanding the nature of diseases, results of illness, its mechanism, symptoms, prevention and diagnosis techniques or self-monitoring practices, appropriate methods for self-care, management and treatment. When knowledge about possible hazards are learned, change can take place much more easily. As a result, the clarification of precise effects of health education on behaviour of the elderly can help prevent the occurrence of chronic diseases. Furthermore, this study attempts to add to the current literature the idea that a health education intervention is able to stop deaths due to chronic diseases in the elderly and finally produce a better life quality and higher life expectancy in elderly women. To achieve this goal, health knowledge, attitudes and practices should be improved through an intervention for elderly women. One theory that focus on individual's health behaviour is HBM. This model considers individual's perceptions (susceptibility, severity, barrier, self-efficacy, and benefit) about a health condition. Therefore, the HBM as a theoretical basis might identify elderly perception and influence belief and effect health behaviour. As a result, this study will employ HBM

to make an investigation into the impact of the health education intervention on changing the elderly health behaviour in Iran. As the number of old people increases in Iran, the need for a health education intervention becomes more serious. It is hoped that this research project can greatly contribute to the understanding of aging and especially the status of elderly women in Iran. When there is a lack of health behavior, the result will be dependency and so a high rate of hospitalization; therefore, a successful diagnosis of diseases associated with unhealthy behavior can be well accompanied by an appropriate intervention.

The findings of this research can assist health program developers in preparing appropriate programs for improving the status of health behavior in elderly women. In addition, the result will help policy makers and health care providers decide what health factors can be emphasized in maintaining the health and life quality of elderly women in Iran. Finally, this research can help to prevent chronic diseases and ultimately allow the elderly to lead a more independent and pleasant life.

1.4 Objectives of Study

1.4.1 General Objectives

This study aims to determine the effect of health education intervention based on HBM on the health behaviour change in the elderly women in Urmia, Iran.

1.4.2 Specific Objectives

1. To determine the socio-demographic characteristics of elderly women.
2. To investigate the impact of a three-month health education intervention on the physical activity and nutrition knowledge in elderly women at baseline, after a three-month intervention and at the end of the follow up in elderly women.
3. To determine the impact of the health education intervention on the physical activity and nutrition beliefs (perceived benefit, perceived barriers, perceived severity, perceived susceptibility, and self- efficacy) in elderly women at baseline, after a three-month intervention and at the end of the follow up in elderly women.
3. To compare the impact of a three-month health education intervention on the nutrition and physical activity performance in elderly women at baseline, after a three-month intervention and at the end of the follow up in elderly women.
5. To examine the impact of a three-month health education intervention on the anthropometric parameters in elderly women at baseline, after a three-month intervention and at the end of the follow up in elderly women.
6. To evaluate the impact of the health education intervention on the biomedical parameters in elderly women at baseline, after a three-month intervention and at the end of the follow up in elderly women.

1.5 Hypotheses of the Study

1. There is a significant difference between the intervention and control groups on knowledge of nutrition at baseline, after three months and at the six months.
2. There is a significant difference between the intervention and control groups on nutrition beliefs at baseline, after three months and at six months.
3. There is a significant difference between the intervention and control groups on nutrition performance at baseline, after three months and at the six months.
4. There is a significant difference between the intervention and control groups on knowledge of physical activity at baseline, after three months and at the six months.
5. There is a significant difference between the intervention and control groups on physical activity beliefs at baseline, after three months and at six months.
6. There is a significant difference between the intervention and control groups on physical activity performance at baseline, after three months and at the six months.
7. There is a significant difference between the intervention and control groups for anthropometric parameters at baseline, after three months and at six months.
8. There is a significant difference between the intervention and control groups for biomedical parameters at baseline, after three months and at six months.

1.6 Definition of Terminology

In this study the following terms are widely used:

Health education: Health education refers to the information that is given to people about health. It deals with principles that people should follow to lead them to improvement, maintenance, or restoration of health. Health education consists of consciously constructed opportunities for learning some form of communication for the promotion of health literacy. It promotes knowledge and life skills required for individual and collective health.

Intervention: The literal definition of intervention is to enter into or mediate between two parties. In health science, intervention deals with the measures taken either for promotion or modification of a person mentally, emotionally, or physically or for the prevention of damage and problems. These actions may involve teaching to follow a proper diet, or take recommended actions seriously. In this study, intervention is examined according to the pattern of health beliefs.

Educational Intervention: The educational intervention deals with the administration of educational programs following the pattern of health beliefs for the promotion of knowledge and behaviour levels, and for the improvement effectiveness of the nutrition behaviour and physical activities in elderly women.

Nutrition: Nutrition, nourishment, or aliment refers to the provision of food needed by organisms and cells to stay alive. In medicine, nutrition is the science or practice of using food. This study measures operational nutrition through certain questionnaires.

Physical activity: Physical activity is defined as body movements which result in the use of energy. It may include a pre-programmed activity such as walking, running, or any daily activity. In this study, physical activity consists of cardiorespiratory endurance.

Health behaviour: Health behaviour refers to any activity performed by a person to improve, protect or maintain health whether or not this behaviour can achieve the goal.

Body mass index: Based on measurement of height and weight at baseline recommended by WHO; body mass index is calculated through $[\text{weight (kg)/height (m)}^2]$.

Perceived susceptibility: The concept of perceived susceptibility involves an individual's opinion about the chance of developing a condition.

Perceived severity: Perceived severity includes opinions about the importance of developing a disease or condition and its medical consequences (such as pain, disability and death) and the social costs (like the impact on a person's work, family and social relationships).

Perceived benefits: Perceived benefits refer to the belief about the positive results of a certain behaviour when a real threat comes up. In other words, the concept suggests that taking a recommended action can reduce the risk or severity of a potential disease.

Perceived Barriers: As the strongest predictor to changes in health behaviour, perceived barriers are concerned with tangible and psychological costs of the recommended action. This concept also addresses an individual's estimation of the degree of social, personal, environmental, and economic obstacles to a specific behaviour or their desirable goal status on that behaviour.

Self-Efficacy: Self-efficacy refers to a feeling that makes one start an activity that will affect one's efforts over time.

1.7 Conceptual Framework

Figure 1.1 indicates the theoretical framework of the study. The framework for this study was built on the basis of the HBM. The constructs of HBM are based on the domains of perceived susceptibility, perceived severity, perceived threat, perceived barriers, perceived benefits, and cues to action.

Before any changes can be made, it is important to understand people's health beliefs and attitudes toward specific health issues. Reviews on health-related behaviour indicate that unless people have no minimal levels of related health motivation and information (cues to action), they will not try to seek for diagnosis, prevention, or treatment for a condition so increasing women's knowledge about the outcome of physical inactivity and unhealthy diet can help produce successful educational interventions. Furthermore, these people must be made potentially vulnerable (perceived susceptibility), aware about the seriousness of their situation (perceived severity) and convinced of the efficacy (perceived benefits) of health intervention.

According to the Health Belief Model if they develop self-regulation abilities (self-efficacy) to change their health behaviours, they will be more likely to involve in the recommended health behaviours.

Based on the literature review and educational principles and by considering of Health Belief Model that aimed to change behaviour, a complementary nutritional and physical activity booklets adopted from ministry of health in Iran was used. The health educational program attempted to promote the nutritional and physical activity of the elderly women and make positive changes in their biomedical and anthropometric parameters level through changing their perception about the risk of nutrition habits and physical inactivity.



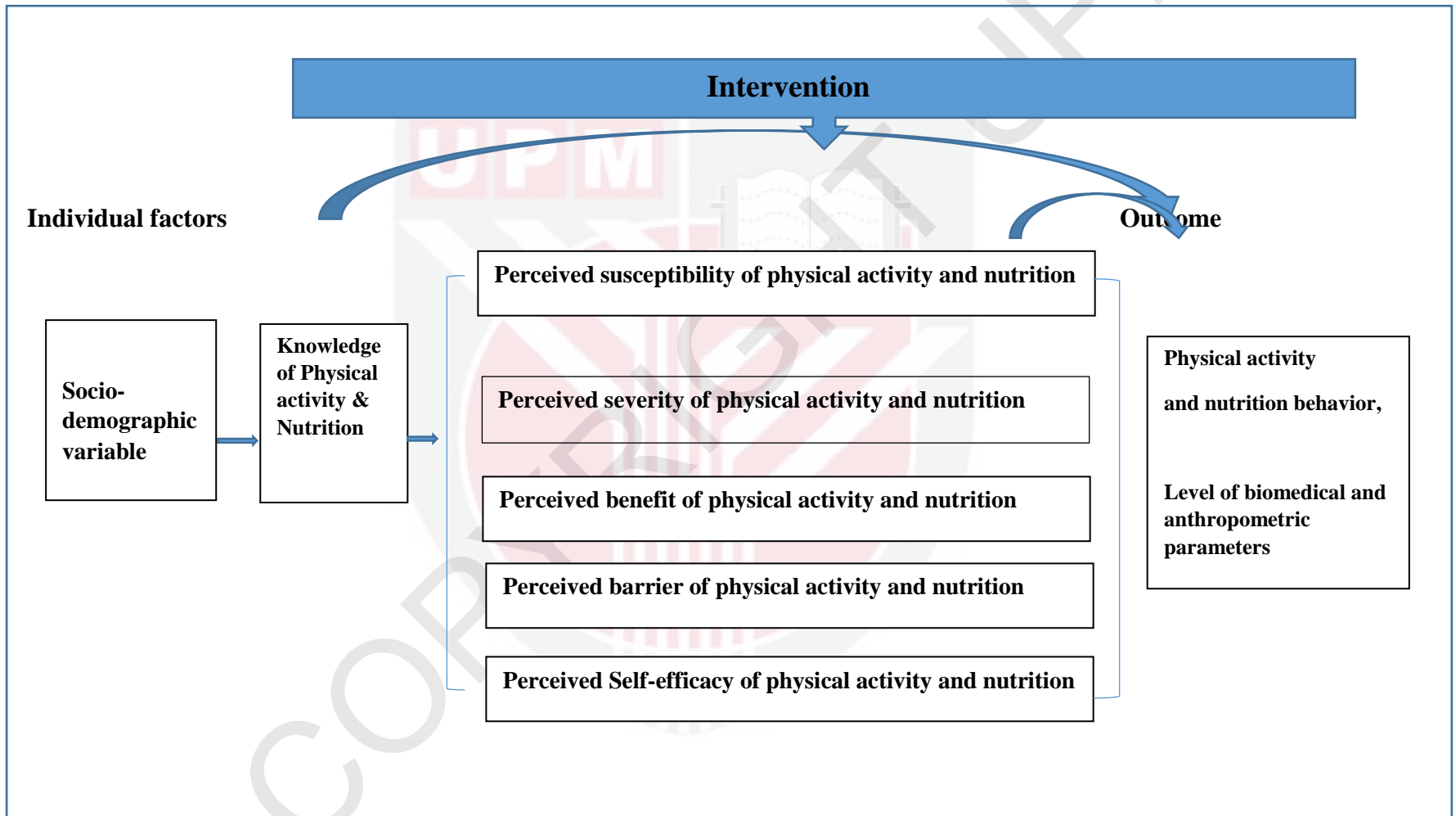


Figure1.1 Conceptual Framework of Health Education Intervention Based on Health Belief Model on the Health Behaviour, Anthropometric Parameters, and Biomedical Changes among Elderly Women in Urmia, Iran

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