

EXAMINING TECHNOLOGY BASED HEALTH COACHING NEEDS OF
COLLEGE GRADUATE EMPLOYEES

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HAKAN KURU

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Approval of the Graduate School of Social Sciences

Prof.Dr.Meliha Altunışık

Director

I certify that this thesis satisfies all the requirements as a thesis for the degree of Master of Science.

Prof.Dr. M.Settar Koçak

Head of Department

This is to certify that we have read this thesis and that in our opinion it is fully adequate, in scope and quality, as a thesis for the degree of Master of Science in Physical Education and Sports.

Assoc.Prof.Dr. Mustafa Levent İnce

Supervisor

Examining Committee Members

Prof. Dr. Ayşe Kin-İşler (HU, FSS) _____

Assoc. Prof. Dr. Sadettin Kirazcı (METU, PES) _____

Assoc. Prof. Dr. Mustafa Levent İnce (METU, PES) _____

I hereby declare that all information in this document has been obtained and presented in accordance with academic rules and ethical conduct. I also declare that, as required by these rules and conduct, I have fully cited and referenced all material and results that are not original to this work.

Name, Surname: Hakan KURU

Signature:

ABSTRACT

EXAMINING TECHNOLOGY BASED HEALTH COACHING NEEDS OF COLLEGE GRADUATE EMPLOYEES

Kuru, Hakan

M.S., Department of Physical Education and Sports

Supervisor : Assoc. Prof. Dr. M. Levent İNCE

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The purpose of this study was to understand technology based health coaching needs of college graduate employees in terms of sex (women & men), exercise stages of change (Contemplation, Preparation, Action & Maintenance) and daily time slots [duration between waking-up and leaving home (T1), duration of transportation to work (T2), duration at work (T3), duration of lunch break (T4), duration of transportation to home (T5), duration at home before going bed (T6), duration of sleeping (T7), duration of non-routine days (T8)] . Participants were 40 college graduate employees (20 women & 20 men, 20-35 years old) from Ankara. All participants were working in a full-time job at least five days a week. Participants exercise stages of change was identified by using Physical Activity Stages of Change Questionnaire. Moreover, an interview was conducted with each of them. During the interview participants firstly ranked six cards (persona cards) that were depicting the one of the six health promoting behaviors including Health Responsibility Support, Exercise Behavior Support, Nutrition Behavior Support, Social Support, Life Appreciation Support and Stress Management Support by the perceived importance for themselves. After that, participants answered questions asking the rationale

behind his/her ranking. Lastly, participants ranked the persona cards with respect to the given daily time slots again, and they answered the questions asking; the rationale behind his/her ranking and expectations from a technology based health promoting system. Quantitative data was analyzed by descriptive statistics and non-parametric test including Mann-Whitney U, Kruskal Wallis ($p < .05$). Interview data was analyzed by content analysis method. Findings indicated that college graduate employees technology based health coaching needs differ in terms of sex, exercise stages of change and daily time slots. Future technology based health promoting system designs should consider the college graduate employees' sex, exercise stages of change and expectations in different daily time slots to meet the specific perceived needs of this group.

Keywords: technology based health coaching, health promotion behaviors, sex, daily time slots, health technology

ÖZ

ÜNİVERSİTE MEZUNU ÇALIŞANLARIN TEKNOLOJİ TEMELLİ SAĞLIK KOÇU İHTİYAÇLARININ İNCELENMESİ

Kuru, Hakan

Yüksek Lisans, Beden Eğitimi ve Spor Bölümü

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Bu çalışmanın amacı üniversite mezunu çalışanların teknoloji temelli sağlık koçu ihtiyaçlarının cinsiyet (kadın ve erkek), egzersiz katılım basamağı (Eğilim, Hazırlık, Eylem ve Devamlılık) ve günlük farklı zaman dilimlerine [sabah uyanıp evden çıkıncaya kadar geçen zaman (T1), evden işe ulaşım zamanı (T2), iş yerinde geçen zaman (T3), öğle arası (T4), işten eve ulaşım zamanı (T5), akşam evde uyuyuncaya kadar geçen zaman (T6), uyku zamanı (T7) ve rutinin değiştiği zamanlar (T8)] göre incelemektir. Çalışmaya Ankara’da yaşayan 25-35 yaş aralığında 20 kadın ve 20 erkek olmak üzere toplam 40 kişi katılmıştır. Katılımcıların tamamı tam zamanlı bir işte, haftanın en az 5 günü çalışmaktadır. Katılımcıların buldukları egzersiz değişim basamağı Egzersiz Davranışının Değişim Basamakları anketi kullanılarak belirlenmiştir. Her bir katılımcıyla görüşmeler de yapılmıştır. Bu görüşmeler sırasında katılımcılar ilk olarak altı farklı sağlıklı yaşam davranış desteğini (Sağlık Sorumluluğu Desteği, Egzersize Davranışı Desteği, Beslenme Davranışı Desteği, Sosyal Destek, Hayatı Takdir Desteği ve Stres Yönetimi Desteği) tanımlayan kartları (persona kartları) kendi yaşantılarındaki önemine göre sıralamışlardır. Ardından, katılımcılara bu sıralamalarının nedenlerini anlamak amacıyla sorular sorulmuştur. Son kısımda ise, katılımcılar tanımlayıcı kartları günlük yaşantılarındaki zaman aralıklarına göre önem sırasına sokmuşlardır ve bu sıralamalarının nedenlerini

anlamak amacıyla yine sorular sorulmuştur. Sayısal veri analizi aşamasında tanımlayıcı istatistik, Mann Whitney U ve Kruskal Wallis ($p<.05$) testlerini içeren non-parametrik testler uygulanmıştır. Çalışmanın bulgularına göre üniversite mezunu çalışanların sanal sağlık koçundan beklentilerinin cinsiyete, egzersiz değişim basamağı ve günlük zaman aralıklarına göre değiştiği anlaşılmıştır. Çalışmadaki bulgular doğrultusunda sanal sağlık koçu tasarlayanların katılımcıların cinsiyet, egzersiz değişim basamakları ve günlük farklı zaman dilimlerindeki beklentilerine göre programlarını geliştirmeleri önerilir.

Anahtar Kelimeler: teknoloji temelli sağlık koçu, sağlıklı yaşam davranışları, cinsiyet, günlük zaman aralıkları, sağlık teknolojisi

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CHAPTER 1

INTRODUCTION

WHO (World Health Organization) stated Quality of Life as “individuals’ perceptions of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concern” (WHO, 2002). However, the term quality of life differs intensely from standard of living, since definition of standard of living is based on income. Quality of life also deals with wealth similar to standard of living but also considers four domains: ecology, politics, economics and culture (Magee, Scerri, & James, 2012).

Health related quality of life is the harmony of the four domains mentioned above. It also focuses on well-being of societies and its individuals. Health related quality of life embraces conditions, policies, regulations and practices about population’s health on community level (Guyatt, Feeny, & Patrick, 1993). On the other hand, emotional, physical and social well-being of individuals are studied on individual level and how individuals may be affected over time about these well-being dimensions (Guyatt et al., 1993).

World Health Organization (1967) defined wellness as “being not just the absence of illness but a state of complete physical, mental and social well-being” (Adams, Bezner, Janet, Steinhardt, & Mary, 1997). The terms wellness and health are used interchangeably in the literature. However, health is a state of being but wellness is accepted as a process for reaching optimum health (Hawk, Schneider, Evans Jr, & Redwood, 2012). The National Wellness Institute (NWI) defined six dimensions of health, namely occupational, physical, social, intellectual, spiritual, and emotional health. Occupational health accepts satisfaction and improvement through work. Job satisfaction, career objectives and performance at work are covered in occupational

health. Physical health described as need for regular physical activity and learning about diet and rejecting use of tobacco. Social health is accepted as reaching good communication with one's environment and community. Intellectual health is encapsulating mental activities and recognizing one's creativity. Spiritual health identifies for meaning and purpose in human's life. Emotional health is recognizing awareness and acceptance of one's feelings (Hettler, 1979).

U.S. Department of Health and Human Services declared that individuals can improve their health related quality of life with moderate amounts of physical activity (General et al., 1996). Different studies showed that physical activity and health behaviors have a positive correlation (Caspersen, Powell, & Christenson, 1985; Ewing, Schmid, Killingsworth, Zlot, & Raudenbush, 2003; Taylor, Sallis, & Needle, 1985). Blair and Jacobs concluded in their study that individuals who participate in physical activity are better on weight control. Moreover, the level of smoking decreases with physical activity and leisure time activity; and physically active individuals tend to perform preventive health behaviors (Blair, Jacobs, & Powell, 1985). These findings showed that physical activity is a key element on designing health promotion programs.

Using the wellness concept, there are evidences that individuals' participation in regular physical activity leads to better health promoting behaviors including nutrition behavior, exercise behavior, health responsibility behavior, life appreciation, stress management and social behavior (Ince & Ebem, 2009). Chen (2003) explained nutrition behavior as eating healthy food, having a healthy diet, drinking enough water and paying attention for meal routines. Individuals' participation in physical activity and their exercise habits are accepted as exercise behaviors. Health responsibility behavior is described as visiting a physician or health specialist for health concerns and caring for hygiene. Life appreciation behaviors mean being positive and performing behaviors for happy feeling. Stress management refers to being aware of emotional state and examining reasons for stress in life and placing priorities and being able to cope with situations causing

stress. Social behaviors are about sharing feelings and emotions with others and building relationships with other people (Chen, Wang, Yang, & Liou, 2003). Recent studies have also indicated that using emerging technologies on physical activity has the potential to improve the motivation of participants in physical activity and health promotion (Consolvo, Everitt, Smith, & Landay, 2006; B. Marcus, Owen, Forsyth, Cavill, & Fridinger, 1998). Other studies examining the effective physical activity based health promotion programs highlight the importance of tailor made programs by considering the needs of individuals or specific groups like people working in different jobs (Anderson et al., 2009; Guazzi et al., 2014; Proper et al., 2003).

Technology which has different effects on physical activity can be resembled to a double-edged sword. Game platforms and computers lead people to have a sedentary life. On the other hand, by the developments in technology, these devices are also designed as tools that promote physical activity and motivate changing health promotion behaviors. Such technologies like GPS (Global Positioning System), heart rate monitoring, activity monitoring and persuasive technologies are kind of motivational tools for promoting and changing exercise behaviors (Heyward & Gibson, 2014). Persuasive and proactive technologies resulted enrollment rates over %90 (Nigg, Courneya, & Estabrooks, 1997). Thus, technology is a powerful tool for promoting health and motivating for physical activity through well-designed programs or systems.

Types of employment in the workplace differ on the time spent on job and requirements of job. Full-time workers usually work for 40 hours per week and at least five days. White-collar employees are accepted as “high level worker” in the types of full-time workers. They are trained and highly skilled professionals who have at least a baccalaureate degree from a college. Among the examples of white-collar employees are accountants, attorneys, engineers, architects and academicians (Bain & Price, 1972).

In a typical day of a college graduate employee, they spend nearly nine hours of their time at work and they generally work at office and practice mental studies instead of bodily exercise. The results of studies on college graduate employees showed that health problems such as diabetes, obesity, cancer are possible risks because of sedentary lifestyle and unhealthy dieting (Castillo-Retamal & Hinckson, 2011; Leslie, Braun, Novotny, & Mokuau, 2013; Lin, McCullagh, Kao, & Larson, 2014).

The college graduate employees earn better thanks to their educational level and qualifications. According to Turkish Statistical Institute (2010), college graduate employees earned mean annual income of 35.383 TL in 2010 which is twice the amount high school graduate employees earn, 21.280 TL (TSI, 2010). As a result, college graduate employees have better economical potentials to reach health care resources and utilities including technology-driven supports (Lusk, Kerr, & Ronis, 1995).

According to review studies, there is no systematic relation on the role of theory in technology-based health promotion programs (Bull, 2010). Technology-based health promotion focuses on individuals on interventions and implementations but these cannot be explained by well-known individual theories related to behavior change. Theoretical models need to be explained together for technology based health promotion. Online systems connects many people together and *social cognitive theory* offers options on understanding how people interact with each other (Bandura, 1986). *Health belief model* is one of the first theories on health behavior of individual. This model explains predicting individual's belief about health behaviors and disease treatment (Rosenstock, 1974). *Theory of planned behavior* explains individual's behavioral aims or objectives on specific behavior (Ajzen, 1985). But all these theories work on with Social Cognitive Theory, as a result of social networking on technology. Individuals interact with others in a virtual network and this network can provide online materials and information, these results change in efficacy and awareness on health behaviors.

The transtheoretical model explains individual's motivational readiness to act a new healthier behavior and change through stages of change. Five stages of stages of change are pre-contemplation, contemplation, preparation, action and maintenance. Aim of this model is move individuals to an upper stage. This model is used for explaining how different processes of change can affect how activities are staged (Marcus & Simkin, 1994; Prochaska & Velicer, 1997; Redding, Rossi, Rossi, Velicer, & Prochaska, 2000). Previous researches showed that exercise stages of change is an effective tool for motivating people toward physical activity and exercise (Daley, Fish, Frid, & Mitchell, 2009; Prochaska & Velicer, 1997). Moreover, Young-Ho explained that mental health variables and exercise behavior significantly correlated (Kim, 2004). As a result, it should be considered to design the health promotion programs and systems in terms of exercise stages of change.

Sensitivity on sex differences for health promotion programs is a key factor for reaching best results for practices (Oliver, 2006). Women live generally longer than men as a result of physiological and behavior differences (WHO, 2009). Moreover women and men have important health and health behaviors differences such as depression, smoking, anesthesia, autoimmune diseases and alcohol consumption. For example, women smoke less than men but they are less successful at quitting smoking (Macintyre, Hunt, & Sweeting, 1996; Shumaker & Hill, 1991). As a result of these important findings, health promotion programs need to be specified on sex.

Activities of daily living are expressed as routine activities need to be done every day without any assistance. There are two types of daily activities. The activities of daily living are basic activities or tasks. The six major activities are eating, dressing, bathing, toileting, transferring and continence. The instrumental activities are complex tasks that requires organizational skills and physical performance such as taking medications as prescribed, managing money, using technology (Blair et al., 1985; Wiener, Hanley, Clark, & Van Nostrand, 1990). These listed activities are performed on different time slots of day, it is better to consider the changes in daily activities according to time slots of day for designing a health promotion practices.

Recent developments in m-health caused a shift in healthcare and health promotion from hospitalized, centralized and limited duration of time to proactive, preventive, continuous and personal healthcare and health promotion. Parallel to these, personal healthcare systems with a holistic wellness perspective need to be designed and health coaching paradigm will be implemented by *m-health* technologies. The aim of the study is to examine the college graduate employees' technology based health coaching needs in terms of sex, exercise stages of change and daily time slots.

1.1 Purpose of the Study

Focusing on six different health promotion behaviors (exercise behavior, nutrition behavior, health responsibility behavior, social behavior, life appreciation behavior and stress management behavior), the purpose of this study was to examine technology based health coaching needs of college graduate employees in terms of sex, exercise stages of change and daily time slots.

1.2 Research Questions

The following questions will be asked to guide this study:

1. What are the college graduate employees' technology based health coaching needs in terms of sex, exercise stages of change and daily time slots?
2. Do the college graduate employees' technology based health coaching needs differ in terms of sex?
3. Do the college graduate employees' technology based health coaching needs differ in terms of exercise stages?
4. Do the college graduate employees' technology based health coaching needs differ in terms of daily time slots?

1.3 Significance of the Study

The underlying philosophy of the personal health technologies is to focus on a specific dimension or dimensions of health. On the contrary, wellness has a holistic perspective on increasing individual's own capacity and being well does not mean just the absence of illness but a complete well-being of physical, mental and social (Adams, Bezner, Drabbs, Zambarano, & Steinhardt, 2000). For example, a persuasive technology product can motivate individual for physical activity, but it cannot examine the glucose level in the blood or any possible cardiovascular health problem. At this point, a corporate system of nutrition coach and exercise coach is needed to analyze what is needed to be eaten before workout. This study will present information on college graduate employees technology based health coaching needs and possibility driven design of a technology based health coaching which promotes individuals health with a holistic perspective.

1.4 Limitations of the Study

The major limitation of the study is containing a small sample and just covering people living in Ankara. As a result, there are limitations for the generalization of the findings. Moreover, in stages of change model Stage 1 (pre-contemplation) was excluded since participants of this stage does not attend physical activity and do not plan to attend physical activity in next six months. In other words, this group do not pay attention for their health status. As a suggestion, this group can be studied with a different perspective on how to motivate this group by implementation of technology. In addition, type of job was not considered in this study. Workplace environment or load of stress could also affect the participants' rankings.

1.5 Definition of Terms

Technology Based Health Coaching: A health promoting system that supports individuals every time on different dimensions of wellness.

College Graduate Employees: This term was used to define characteristics of participants. These participants were graduated from a college with at least 4 years of education and working on a full-time job at least five days a week.

Persona Cards: 6 visual cards that were designed by experts, demonstrating six health promoting behaviors; Exercise Behavior, Nutrition Behavior, Health Responsibility Behavior, Social Behavior, Stress Management Behavior and Life Appreciation Behavior.

Health Promotion Behaviors: In this study, six different health promotion behaviors were investigated; Exercise Behavior, Nutrition Behavior, Stress Management, Social Behavior, Life Appreciation and Health Responsibility Behaviors (Chen et al., 2003).

Exercise Stages of Change: Five different stages of people's physical activity behaviors were studied. These stages are pre-contemplation (people with no intention to exercise), contemplation (people with intention to exercise but not participate), preparation (people who has just started to participate in regular exercise), action (people who participate in regular exercise between one and six months) and maintenance (people who participate in regular exercise more than six months) (Marcus & Owen, 1992).

Time Slots: In order to design these time slots, a typical college graduate employee's whole day was considered and eight time slots were decided. These time slots were duration between waking-up and leaving home (T1), duration of transportation to work (T2), duration at work (T3), duration of lunch break (T4), duration of transportation to home (T5), duration at home before going bed (T6), duration of sleeping (T7), duration of non-routine days (T8).

CHAPTER 2

REVIEW OF THE LITERATURE

In this chapter literature, studies and practices about wellness and health, health promotion behaviors, and personal health technologies will be explained in details.

2.1 Wellness and Health

Wellness have various definitions. Monroe defined wellness as process of optimal well-being that focuses on maximizing the individual's potential in terms of physical, intellectual, emotional, social, spiritual and environmental well-being (Monroe, 2006). Another definition states that "the active process through which the individual becomes aware and makes choices toward a more healthy existence" (Healer, 1980:77). In order to fulfill wellness concept, a holistic approach covering all dimensions of wellness is needed. According to National Wellness Institute, wellness has six dimensions (Bill Hettler, 1976). *Physical wellness* is explained as the physical health and participation of physical activities. The aim of the physical wellness is to increase physical capacity of people by physical activity and proper nutrition. *Emotional wellness* is more than struggling with stress it is described as "a positive self-concept to deal appropriately with one's feelings". Van Rensburg et al (2011) define *social wellness* as explaining how people connect how they build meaningful interpersonal relationships. Another definition for *Social wellness* is being comfortable with one's emotions such in emotional wellness (Van Rensburg, Surujlal, & Dhurup, 2011). Family relations and friend network is also discussed in this kind of wellness. *Intellectual wellness* is thinking critically about issues and making decisions and also finding solutions (Van Rensburg et al., 2011). *Spiritual wellness* aims to ponder the meaning of life and creating tolerance to other beliefs

(Bill Hettler, 1976) (Table 2.1). In relation to these, “being well” can be defined as being in a scale of average of all these dimensions.

Table 2.1. *Wellness Theorv Models*

		Social	Emotional	Physical	Intellectual	Spiritual	Psychological	Occupational	Environmental
1	1980 Hettler	The individual's relation to others and to the environment, the relationship included the extent to which an individual contributes to the common welfare of the community and environment	the awareness and the acceptance of a wide range of feelings in one's self and others, as well as one's ability to constructively express, manage, and integrate feelings	one's attention to physical self-care, activity level, nutritional needs, and use of medical services	the degree to which one engages one's mind in creative and stimulating activities, as well as the use of resources to expand one's knowledge	a worldview that gives unity and goals to thoughts and actions, as well as the process of seeking meaning, purpose in existence, and understanding of one's place in the universe			
2	1990 Leafgren	contributing to one's environment to achieve of and action toward other's needs	awareness and acceptance of feelings, the degree to which one feels positive about life and about oneself, and the capacity to manage feelings and corresponding behaviors	embodying cardiovascular strength and regular physical activity, as well as a knowledge of food and the implementation of healthy dietary choices	the use of available resources to expand, improve and share knowledge and skills	seeing meaning and purpose in life and the appreciation of the expense of life and the forces that exist in nature		one's attitude about work and the amount of personal satisfaction and enrichment one gains from one's work	
3	1992 Croze et al	the history of significant relationships and the quality and extent of one's social network	focuses on coping styles and patterns, self-awareness and self-image, attitudes toward emotion and disclosure, and one's psychiatric history and use of medications	including medical history and medications, body awareness and image, exercise and eating behaviors, and attitudes toward physical fitness and health care	one's education and learning history, mental status, cognitive style and flexibility, and attitude towards learning	religious and spiritual history, life satisfaction, purpose and meaning of life, beliefs about death and attitudes toward the relational aspects of living		one's attitude toward work and leisure as well as one's work history, patterns and balance between vocational, avocational and leisure activities, and vocational	

Table 2.1. *Wellness Theorv Models (continued)*

4	1997	Adams et al	The amount of support received and reciprocated and the value attached to the actions of giving and receiving support	a secure internal self-image and a positive sense of self-regard, or the extent of self-valuing	a positive perception and expectation of physical health	the optimal level is not too much or too little stimulation because each has adverse consequences	a positive perception of meaning and purpose in life, as well as recognition and acceptance of a unifying and integrating force between mind and body	the individual's sense of optimism that he or she will experience positive outcomes resulting from the vents and experiences of life
5	2000	Renger et al	The extent to which one gets along well with the others and is comfortable with expressing and willing to express one's feelings, needs, and opinions	one's level of anxiety, depression, well-being, self-control, and optimism	one's level of fitness and nutrition, as well as the avoidance of harmful behavior and usage of medical services	one's orientation and achievement toward personal growth, education and achievement, and creativity	finding a basic purpose in life and the pursuit of a fulfilling life; the ability to give and receive love, joy and peace; and one's willingness to help others	balance between home and work life, as well as an individual's relationship with nature and community resources
6	2000	Durlak	competencies as peer acceptance, altruism, attachments/bonds with others, and social skills whereas problem areas in social wellness included peer rejection, social isolation, social anxiety and violence/delinquency		Competencies in physical wellness included physical indices (muscle tone, cholesterol level and blood pressure) and behaviors (eating habits and exercise levels).	Domain of adjustment included developing talents and abilities, learning how to learn, and developing higher order thinking skills		

On the other hand, Greek physicians explain health as a condition of perfect equilibrium (Jonas, 2010). Health mostly considered as not being ill or having no disease but The World Health Organization defines health as a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity (WHO, 2007). On the other hand, wellness term is used interchangeably with health both contain similar issues such as, physical, emotional, spiritual, social and environmental. It is possible to state that all issues are related to the quality of life. Jonas (2010) states the relationship between health and wellness as;

“Health is a state of being that changes over time and can be measured at any time. Wellness is a process of being with a goal of trying to achieve optimum health at any given time” (Jonas, 2010)

2.2 Health Promotion and Public Health

Health promotion is defined variously but all definitions focus on striving for good health. WHO expressed health promotion at The First International Conference on Health Promotion (1986) as “The process of enabling people to increase control over the determinants of health and thereby improve their health” (WHO, 1986). Green & Kreuter’s defined as “any planned combination of educational, political, regulatory and organizational supports for actions and conditions of living conducive to the health of individuals, group or communities” (Green & Kreuter, 2005). In the history, health promotion concept appeared on 1980’s at first but in order to understand its definition and meaning the evolving changes need to be examined.

Three critical phases was observed on broad history of public health. The first phase was over the nineteenth century. The industrialization and urbanization played a key role on population growth and people moved from countryside to cities for finding jobs in the factories and began a new life style. Capital and major cities became larger cities, one of them was London. Between 1800 and 1900, population of London increased seven times from 74.000 to 522.000. In these rapidly grown cities, conditions on housing and working were poor, because developments in housing and

working conditions did not keep the speed with population grown. As a result, poor housing and lack of sanitation such as refuse from water closets, wastes from slaughter houses were affected quality of life. In nineteenth century a series of infectious diseases caused by improper housing and lack of sanitation thrived such as cholera and typhoid and 53.000 people died on these outbreaks.

The second phase of public health is called “The Bacteriological Revolution”. Louis Pasteur and Robert Koch, in Germany discovered micro-organisms that caused infectious diseases. As a result of their studies effective drug treatments were developed. It was understood that instead of cleaning environment it is better to focus on individual and disease. In the early twentieth century, interest was shifted towards to different type of hygiene that was called “social hygiene”.

Phase three is defined as the new public health. Terms as individual behavior, prevention, safety and risk were begun to be discussed in this phase. In 1970’s, it was understood that the decline in the mortality rates are not result of medicine, instead it was result of developments in living standards and nutrition and as a result health promotion have been emerged. (Berridge, Gorsky, & Mold, 2011; Davies & Macdowall, 2006; Macdowall & Davies, 2006).

Public health, in other words collective health, deals with organized institutional practices and focusing on promoting population health (Czeresnia, 1999). Public health encapsulates practices like health education, health improvement, health protection, disease prevention and health development. The difference between health promotion and public health appears on concept of disease. Public health also tends to be responsible on health promotion but practices focuses on not falling ill. In other words, health promotion mainly have a broader social effect upon collective and individual health (Davies & Macdowall, 2006).

Health behaviors have various definitions, such as “action taken by an individual or group of individuals to change or maintain their health status or prevent illness or

injury” (Prevention, 2011). Ingledew (1996) explained health behaviors as any action or behavior considering health (Ingledew, Hardy, Cooper, & Jemal, 1996). In literature, health promotion behaviors are accepted as observable actions such as physical activity, exercise, drinking and tobacco or drug use. In addition to these, oral health behaviors, sleep hygiene and driving are accepted as less studied health behaviors on the literature (Park & Iacocca, 2013).

Workplace health promotion is favorable, because a typical college graduate employee spend one third of their day or half of the hours they are wake at work. As a result, workplace is an ideal community-based site for changing or shaping health behaviors. Promoting these health behaviors decreases the cost on health-insurance system and increase the productivity. An economical statistic claimed that workplace health promotion programs returns on investment as high as 6-to-1, that systems must be well-implemented for achieve this ratio (Baicker, Cutler, & Song, 2010).

Although workplace health promotion programs differentiate by capacity of organization, environment or physical worksite, location of the workplace, health promotion programs focuses on three major type of activities; awareness, life style change and supportive environment (O'Donnell & O' Donnell, 2002). Awareness aims to increase knowledge or awareness of employee about a health subject or health behavior. Lifestyle change health behavior changes, health practices and feedback by health educations. Supportive environment attitudes or regulations of company such as preferring healthy foods in company meetings or putting healthy food in vending machines or serving fruit or brining healthy food on Fridays (Harris, Hannon, Beresford, Linnan, & McLellan, 2014).

2.2.1 Health Promoting Behaviors on Nutrition

Nutrition is vital for health, well-being, growth and development. Unhealthy nutrition causes coronary heart disease, cancer, stroke and type 2 diabetes (Ventura,

Martin, Curtin, Matthews, & Park, 2000). Nutrition diverges in two types for health promotion; *healthy nutrition* and *malnutrition* (WHO, 1998a). *Healthy nutrition* discusses effect of food and health care and defined as consuming safe food as containing essential nutrients according to bodily requirements (WHO, 1998a). In addition to bodily requirements, healthy nutrition contributes on social, mental and physical well-being in a positive context directly or indirectly. On the other hand, *malnutrition* is “any physical condition resulting either from an inappropriate or inadequate diet, such as a diet that either provide too much or too little of necessary nutrients, or from a physical inability to absorb or metabolize nutrients” (Control, Prevention, & America, 2008). Malnutrition can be a cause of different reasons such as; sanitation, poverty, lack of education and diseases. In health promotion, main purpose of nutrition is promoting health and lower the risk of diseases. Health promotion behaviors subjects for college graduate employees can be listed as below (WHO, 1998b):

- Intake of vegetables, fruits and grain products
- Weight loss practices
- Calcium intake
- Salt and sodium intake
- Iron deficiency
- Use of food labels
- Reduced-fat processed food
- Low-fat, low-calorie restaurant food choices
- Home delivery meals
- Nutrition education
- Workplace nutrition programs
- Nutrition assessment

2.2.2 Health Promoting Behaviors on Health Responsibility

The driver of the personal health responsibility was enlightened by Daniel Wilker (medical ethicist) as “individuals are responsible for their health” (Minkler, 1999). Personal health responsibility described as self-management, self-regulation, self-control, self-monitoring and health maintenance (Estelle-Brazzell Horton, 2014). Betancourt and Quinlan described personal health responsibilities as following instructions of health professionals and go through with the treatment plans. In other words, personal health responsibilities can be understood as taking care of oneself. Estelle-Brazzell (2014) listed a group of personal health responsibility behaviors as listed below (Estelle-Brazzell Horton, 2014):

- Going for check-ups and go to health professional on a routine
- Going to doctor in case of any health problem
- Sleeping enough that body can recover
- Eat healthier fluids and foods for nourishment
- Participating physical activity to stay fit
- Managing body composition
- Doing stress relieving activities to eliminate physical, mental and emotional strain
- Gaining awareness on health
- Avoiding unhealthy behaviors that can cause health problems
- Practicing safe sex
- Repeating healthy behaviors consistently

2.2.3 Health Promoting Behaviors on Exercise

The terms physical activity and exercise are used interchangeably. *Physical activity* defined as any movement of body produced by muscles causing energy expenditure, such as household or climbing stairs for arriving house. On similar, *exercise* is encapsulated by physical activity but exercise is a planned physical activity and

structured, repetitive and physical maintenance (Caspersen, Powell, & Christenson, 1985). Pender and Barkaskas (1992) outlined health promotion behavior as “directed toward sustaining or increasing well-being, personal fulfillment and self-actualization”(Chen et al., 2003). In this study, instead of physical activity, the term exercise is selected in parallel to Chen’s health promotion behaviors defined in the Health Promotion Scale (Chen et al., 2003).

The studies showed that adults who are physically active tend to have positive health behaviors such as eating healthier foods, desire to manage body composition (Blair et al., 1985; Simoes et al., 1995). Another study reveals that tobacco and drug use have a negative association with participating sports (Shilts, 1991).

2.2.4 Health Promoting Behaviors on Stress Management

Lazarus (1966) explained stress as “stress occurs when an individual perceives that the demands of an external situation are beyond his or her perceived ability to cope with them” (Lazarus & Folkman, 1984). Another definition explained stress as an element that can change or manipulate one’s physical or mental status according to the situations, challenges or threats (Zimbardo, Johnson, McCann, & Carter, 2006). Stress is classified into two distinct categories, eustress and distress. “Eu” means “good” in the Greek language and related stressor can be positive on a cognitive manner such as making new friends. On the other hand, distress have negative effect as a stressor which can decrease productivity (Colligan & Higgins, 2006). Studies showed that chronic stress have a relation with various health behaviors. A study showed that people living in a stressful daily life tend to act negative health behaviors (Krueger & Chang, 2008). Siegrist (2006) examined 46 studies about health behaviors and work stress and found a relationship with increased alcohol consumption and overweight (Siegrist & Rödel, 2006).

Health behaviors on stress management depends on individual’s characteristics such as demographics, culture, personality and social environment (Park & Iacocca,

2013). Also sex differences effect stress management behaviors and coping techniques (Matud, 2004). Main stress source of college graduate employees is workplace stress and coping with stress involves two types of activities; unhealthy behaviors such as drinking alcohol, smoking etc. or practicing exercise for relaxation and cognitive works such as accepting situation or change.

2.2.5 Health Promoting Behaviors on Life Appreciation

Optimism and well-being have a positive relation and these findings have already been practiced on interventions (Wood, Froh, & Geraghty, 2010). Unlike optimism, gratitude or appreciation have not been researched yet (McCullough, Tsang, & Emmons, 2004). Life appreciation is focusing on noticing and realizing positive side of life (Wood et al., 2010). Study showed that happiness effects all parts of life, work, relationships and physical health (Lyubomirsky, King, & Diener, 2005). Happier people works more productively, have more friends and have more social activities and have stronger immune function (Layous, Chancellor, & Lyubomirsky, 2014). Many researchers conducted on behavior reinforced happiness. Some of these findings were listed below:

- Thinking optimistically (Scheier & Carver, 1993)
- Being appreciative for life's sanctifications (McCullough, Emmons, & Tsang, 2002)
- Savoring positive experiences (Jose, Lim, & Bryant, 2012)
- Doing something for others (Krueger, Hicks, & McGue, 2001)

2.2.6 Health Promoting Behaviors on Social Life

The reviews flashed that there is a relation between perceived low social support and different health problems (Molnar, Sadava, Flett, & Colautti, 2012). In addition, people recognize social support as appraisal of having reliable connections with other (Savelkoul, Post, De Witte, & Van Den Borne, 2000). Emotional support,

tangible/instrumental support and informational support were the types of social support (Brooks, Andrade, Middleton, & Wallen, 2014).

2.3 Technologies on Personal Health Care and Health Promotion

As a historical progress of e-health, m-health evolved as most frequently used technology-based health promotion. Smartphones, tablets, mobile and wireless devices are counted as m-health tools. With the great improvements in data transfer and network technologies, m-health evolved into bio-monitoring mobile and wearable devices.

Persuasive role of technology explained with Social Cognitive Theory as new styles of behavior by the effect of social diffusion (Bandura, 1986). In this manner, adaptation of technology as a social actor to connect individuals of the society. In relative to the Social Cognitive Theory all wearable devices focusing on developing applications or software to share practices on social platforms or discuss on these activities and behaviors with others.

Nowadays most popular form of m-health are “applications” or “apps”. These applications can be used for different health promotion purposes. There two types of m-health apps in stores (AppStore and Google Store) according to consumer purpose of use. Applications that consumer operates and applications that health care operates (Silberman & Clark, 2012). Consumer-operated may be used for different purposes such as monitoring daily physical activity that counts daily steps or recording how much water was drunk, reminders for drug intake. Health care operated applications are operated by health care professionals or clinical. The collected vital signs, patients were tracked and their medical records used for diagnostic any possible health problem (Silberman & Clark, 2012).

The relation between e-health and health cost cannot be generalized. The relation depends on the economic status of the countries. Technology based health care

increases the unit costs upward, on the other hand, in poor or underserved countries low-cost technologies decreases the unit costs since technology innovation is newly accepted on interventions (Schweitzer & Synowiec, 2012).

The technology behind m-health contains hardware, software and data transfer components. All these components work in a harmony for different health promotion practices. These technological components encapsulate *sensors* as hardware component for measurements such as pressure sensors for blood pressure, galvanic skin response sensors (Kaspari & Stern, 1996; Welk, McClain, Eisenmann, & Wickel, 2007). *Accelerometers* used for measuring movements on 2-dimensional or 3-dimensional plane. These accelerometer based m-health tools need to be worn in order to understand the movement of body. Using data collected by accelerometers individuals' energy expenditure can be estimated (Schuler, Grammatikos, & Fegley, 1967; Swartz et al., 2000). *Microphones* employed for detecting sounds, speaker recognition or revealing activity or location (Axisa et al., 2005). Camera for recording video or capture photo to examine movements or recording activities (PERU). Other than hardware, m-health tools carry on different *software* and *interfaces* for making tools user friendly and loyalty.

Great developments in data transfer shapes m-health evolution. Some *mobile network technologies* were wireless local area network (WLAN), wireless personal area (WPA), wireless are network (WAN). Other data transfer components are Wi-Fi, Bluetooth, gsm, ZigBee, UMTS, WiMAX and so on (Istepanian, Jovanov, & Zhang, 2004; Varshney, 2007). *Radio-frequency Identification* operated for identification or counting (Wicks, Visich, & Li, 2006). *Actuators* handled for remote controlling or moving (Y. Chen & Mintun, 1996).

In addition to these components, different types also listed for designing wearable m-health tools multi-layered printed circuit boards and other integrated circuits, microprocessors, digital signal processing, thin and flexible batteries and smart textiles and fibers (Axisa et al., 2005).

2.3.1 m-health on Nutrition Behavior

Smart phone applications were most popular type of m-health used for individuals. When *AppStore* was searched with “nutrition” keyword 2174 results were found. These applications support individuals on different manners.

myFoodPhone is an example of application that user can take a photo of what was eaten and send it to nutritionist and get feedback about the food (Herting; Tanguay & Heywood, 2007). Unfortunately, this application cannot be downloaded on *AppStore Turkey*, it can be downloaded on *AppStore USA*. Another free application is *Sodium 101*. The purpose of this application is to decrease the amount of sodium which is mostly taken by packed or takeout foods. Users can monitor the amount of sodium in the packed foods or takeout foods by reaching the applications database. This application have been used by Canadian Federal Government to reduce dietary sodium to prevent hypertension (Campbell, Willis, L'Abbe, Strang, & Young, 2011).

Another interesting application is *Caffeine Zone* for coffee lovers (Figure 2.1). The application was developed by Penn State researchers and notify the best time to enjoy a coffee for energy-boosting time. In addition, it tracks total amount and take your attention on exceeding the limits for a sleepless night (Beaudoin & Schmorow, 2011). *MyFitnessPal* is the most popular smartphone application and is used by nearly 50 million people on worldwide (Figure 2.1). To track the nutrition either user can enter the name of the food or scan the barcode. The database used for searching contains more than 3 million foods. By getting information what was eaten or what will be eaten people can adjust their behaviors or food selections. Also, the application is working corporately with exercise behaviors by entering the activity application can make an assumption on calorie expenditure and calculate calorie balance (Yusof & Iahad, 2012).



Figure 2.1. Snapshot of Caffeine Zone and myFitnesspal

For individuals who frequently eat outside “*Restaurant Nutrition*” was developed. Users can get information about 100 restaurants and 15000 food choices and also track their nutrition and prepare a journal (Figure 2.2). By using “*Restaurant Nutrition*” users can select healthier options and even healthier choices at fast food restaurants (Kollar, 2012). *Fresh fruit* is specifically serving information about fruits and nutritional benefits of fruits in current season.



Figure 2.2. Restaurant nutrition application for iOS

2.3.2 m-health on Health Responsibility

Smartphone applications on health differs variously. Personal health recorders, for living with health and medical issues, drugs and medicines, pregnancy and child care and first-aid and emergency.

MyHealth and *ExpressWELL* are preferred as personal record holders. Both these applications collect information and records your personal medical information that were needed while visiting a doctor. For example, *MyHealth* collects and stores information on medications, medical history, personal and emergency contact information, chronic conditions and special needs, lab results and notes from doctor's visits (Al-Fedaghi & Nour Eddine, 2007; Fox, 2007; Kharrazi, Chisholm, VanNasdale, & Thompson, 2012; Kollar, 2012).

Applications for individuals have health problems are also considered by application developers. *iHealth Log* is tracking all measured results and monitor effect of the medicines. In addition, detailed information on medicines dosage, frequency and effects, refill information. On the physician's point, *iHealth Log* can send summary reports and a daily diary of medications and measurements (Kollar, 2012). *iTriage* is another health care application. This application is used as an information source covering 300 symptoms, 1000 diseases and 350 medical procedures (Holmes, Liu, Gu, & Gasti; Hudson, 2012).

iMeds is an U.S. specific application that serves detailed information about FDA approved medicine and prescribing information of each drug in PDF version. *Meds Family* is also a medicine tracker but this application can consider whole family medications (Gupta et al., 2012; Kollar, 2012).

Some applications focus on women for providing support on pregnancy and childcare. *FertilityFriend* and *Pregnancy Alarm* are menstrual calendars for predicting possible fertility days. *Baby Bump* tracks women on pregnancy duration and serves information on baby's physical measurements. In addition, users can

count the number baby kicks and contractions (Clark, Bartold, & Bryant, 2010; Hohmann, Payne, & Crossley, 2008; Kollar, 2012).

m-health on first aid and emergency is growing fast as a result of rapid actions for all cases of m-health tools. *American Medical-Aid* is supporting users on what to do on an emergency or other medical need. *CPR&Choking* also supports on medical emergencies by providing videos. *Close Call* differs from other applications since this application contains your phone number and sends a short message to alarm health situations (Kollar, 2013).

iHealth labs developed different products on health for different purposes. Company focuses on most frequent health problems and tracking health signs. *Wireless Pulse Oximeter* measures both pulse and oxygen level of blood and with Bluetooth connection user can track progress or share results instantly. Another product of *iHealth Labs* is wireless body analysis scale. It can measure and track weight, body fat, lean mass, muscle mass, bone mass, body water, daily calorie intake, body mass index and visceral fat rating. In addition to product, application allows user to set goals and reminders and monitor changes on characteristics. The measurements are synchronized with application via Bluetooth (Figure 2.3).



Figure 2.3. iHealth wireless body analysis scale

For measuring blood pressure three different products have been provided; *Wireless blood pressure wrist monitor*, *wireless blood pressure monitor* and *blood pressure*

dock. Wireless activity and sleep tracker was also developed for measuring and tracking daily activities (Figure 2.4). Device can measure steps taken, calories burned, distance travelled, sleep hours and sleep efficiency (Grimaldi, Kurylyak, Lamonaca, & Nastro, 2011; Midriff & Latman, 2013; Shang, Zhu, Zhu, Liu, & Wan, 2013; Vashist, Mudanyali, Schneider, Zengerle, & Ozcan, 2013).



Figure 2.4. iHealth products

2.3.3 m-health on Exercise Behavior

Different types of mobile applications were developed for fitness or tracking outdoor activities. One of the most popular and useful application on fitness is developed by Nike and named it as “*Nike Training Club*” (Figure 2.5). Users are divided into three different levels: beginner, intermediate and advanced. When user picks a level, different workouts with different focuses appear. The pictures and videos can be seen during the exercise for applying proper technique. On the motivational part, user can sync their progress with Facebook and show them or challenge with friends (Hasman, 2011; Kranz et al., 2013).



Figure 2.5. Snapshot of Nike Training Club

For tracking outdoor activities “Endomondo” is a popular option between these types of applications (Figure 2.6). Users can track the route, distance, time, and information about speed, calories, altitude changes and also pace per kilometer. In addition, user can share the activity information via Facebook or Twitter.

Endomondo is just not an outdoor activity tracker, but also user can enter their indoor workouts. Upgrading the membership to a premium mode, user can get training plans, detailed workout statistics and training analysis. Moreover, user can watch their heart rate by using additional equipment (Consumption, 2012; Pouke, 2013).

In addition, outdoor activities always have safety problems, in order to solve safety problems developers studied about different strategies. “*Kitestring*” is a simple application developed for unsafe conditions. Application checks up user on a routine, if user do not respond or postpone it, application sends emergency short message to selected contacts (Giddings, 2014).

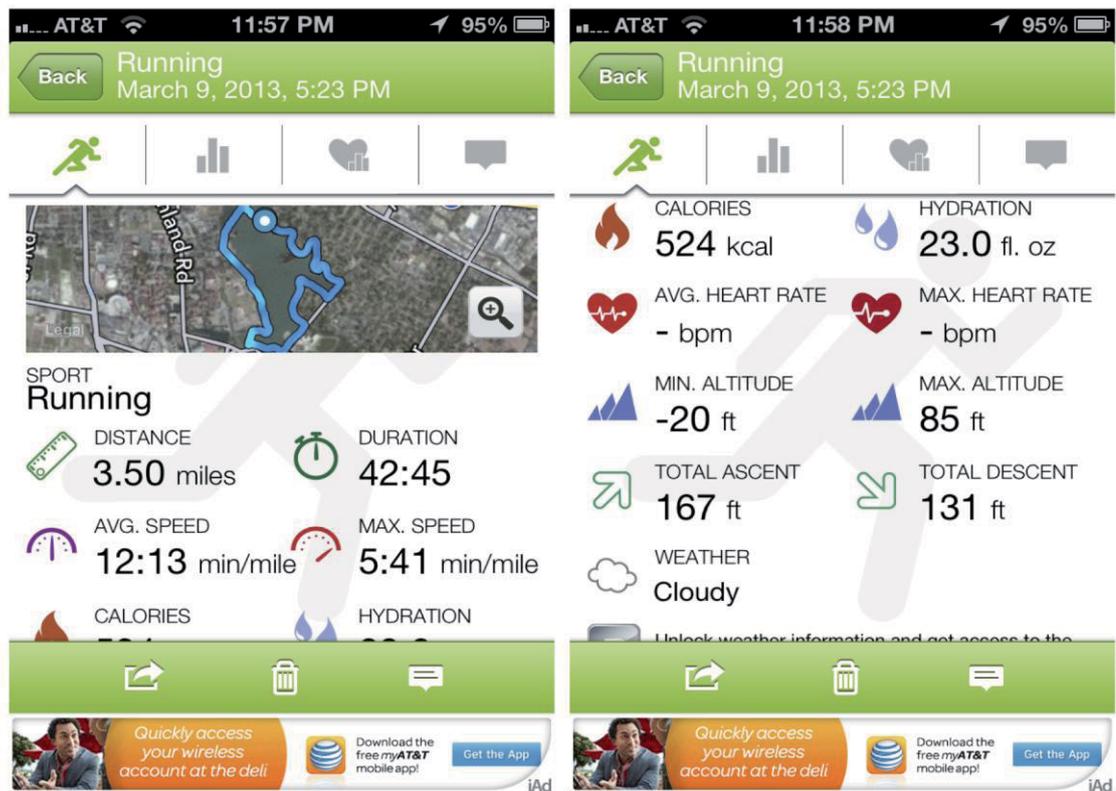


Figure 2.6. Snapshot of Endomondo

Mobile technologies on exercise behavior covers different products other than applications. Activity trackers or called as multi-sensor body monitor are designed for tracking user activities. An example of multi-sensor body monitor is *BodyMedia* including sensors like skin temperature, 3-axis accelerometer and galvanic skin response (Figure 2.7). *Bodymedia* can monitor different data such as calories burned, physical activity with two different levels, heart rate with body strap, sleep duration, sleep efficiency. Mobile application is also available for *BodyMedia*. Application features real time visual feedback, trending reports, personal bests and integration with social platforms. In addition, user can log daily food, daily calorie estimate, calorie balance and health parameters such as weight and weight circumference (Andre et al., 2006; Teller & Stivoric, 2004). Other popular multi-sensor body monitors are *bodybug*, *bodybuggSP*, *exerspy*, *amiigo* and *basis*.



Figure 2.7. BodyMedia System

The other kind of wearable products is heart rate monitors. These products have limited features and main purpose is to measure heart rate during exercise. Polar and Garmin are the popular brands on market and some models include GPS sensors to track the location of the workout. Encapsulated GPS sensor allows user to track workout and get instant feedback on speed, pace and distance. It can also estimate calories burned and heart rate and report measurement instantly with watch and with mobile application after workout. *myTREK*, *Suunto* and *Adidas micoach* are some of other heart rate monitors on the market. Activity monitors are accepted as primitive models of multi-sensor body monitors. They have only accelerometers that can measures physical activity. Since these devices do not collect enough data on body, their calorie expenditure measurements are done on estimation. *Misfit Shine* is one of them. What makes it different is its design as an accessory (Figure 2.8). It can be worn as bracelet, neglect or put it can be put in pocket. 3 colors are available, grey, silver and aluminum. Misfit Shine weights 9 grams and have a diameter of no larger than an average coin. It can records physical activity and sleep. It is able to recognize different sports such as cycling, tennis or swimming.



Figure 2.8. Misfit Shine

2.3.4 m-health on Stress Management

Breath2Relax was developed by The National Center for Telehealth and Technology. This application uses breathing as a weapon for stress management. It teaches how to perform diaphragmatic breathing and user practice this skill on their own. Using touch-screen technology, users' stress levels can be recorded by "visual analogue scale" by swiping the bar to the left or right (Lehrer et al., 2013). "*T2 Mood Tracker*" is another application developed by The National Center for Telehealth and Technology. User can define or select the appropriate mood in six different scales, anxiety, stress, depression, brain injury, post-traumatic stress and general well-being (Figure 2.9).

In addition, by tracking system users can also use the application for symptom tracking such as user can understand the things that effect migraines by examining changes in diet (Chang, Kaasinen, & Kaipainen, 2013; Langrial, Stibe, & Oinas-Kukkonen). "*Stress Tracker*" aims to help users to change their emotional and mental health. Easy-to-use interface allows users track their stress levels, moods, stressors, symptoms and behaviors (Figure 2.9). Users can take notes on coping strategies with stress and personalize their experience. Application visualizes daily history with bar charts (Olivier, 2012).



Figure 2.9. Snapshots of Stress Tracker and T2 Mood Tracker

2.3.5 m-health on Life Appreciation

Practicing gratitude or appreciation listing things is a good way. Applications on gratitude based on this phenomena. “*The Gratitude Journal*” is a popular application that asks users list five things on every day for being grateful about that things (Figure 2.12). By listing things on a journal, user may change attitude towards life. Developers suggested at least a month usage for observing changes in attitude (Parks, Della Porta, Pierce, Zilca, & Lyubomirsky, 2012). “*Live Happy*” applications allows users focuses on happiness levels of users and suggest solutions or activities for boosting, such as calling a friend or texting from contact list (Parks et al., 2012) (Figure 2.12).



Figure 2.10 Snapshots of “Live Happy” and “The Gratitude Journal”

2.3.6 m-health on Social Support

Oxford dictionary defined social network as a website or application or platform that can provide communication with each other by posting texts, photos or sending messages. Social applications differ according to purposes; chat and messaging, location, photography, postcards, music, friend and contact management, dating, fashion, audio and video and polls and questions, Other than Facebook and Twitter, different social platforms are developed for different social networking areas.

“*Foursquare*” is another popular application that is based on sharing location on a social platform. In order to increase motivation and loyalty awards are given such “badges” and also earn titles like “*mayor*” for most often check-in in one place. Interestingly, KLM Royal Dutch Airlines launched a new program “*Meet and Seat*” (Figure 2.10). This application provides seatmate selection either Facebook or LinkedIn profiles. Passengers can meet before flight for coffee or share a taxi before or after flight (Spinder, 2012). “*WhatsApp*” is a chat and messaging application with 400 million monthly active users. Users can chat, send voice messages, photos or share location with the last updates of the application (Church & de Oliveira, 2013; Guide).

Meet & Seat

KLM Meet & Seat is a very simple way to connect with fellow travelers on your flight. Because we believe meeting new people is a great way to start a journey of inspiration. All in three easy steps via klm.com

1



Share your social profile ...
After booking your KLM flight, choose which Facebook or LinkedIn profile details you would like to share.

*Please note that Meet & Seat is available on a limited number of destinations. More will follow before summer 2012.

2



... see who will be on board ...
View the profile details of your fellow passengers to find like minded travelers or potential business partners.

3



... and if you want: pick a seat next to someone interesting.
Or how about a coffee at the airport or sharing a taxi after your flight.

Like Meet & Seat? Help us make Meet & Seat even better by sharing your ideas via [f /klm](#) or [@klm](#)

Figure 2.11. Meet and Seat program

“Instagram” focuses on photos and simplicity. With Instagram user can take a photo and post it with different filters and other effects (Figure 2.11). The photos can be uploaded and seen on news feed. Different than other social networking platforms users can only send photo or video messages instead of text (Frommer, 2010; Osmann, 2013).

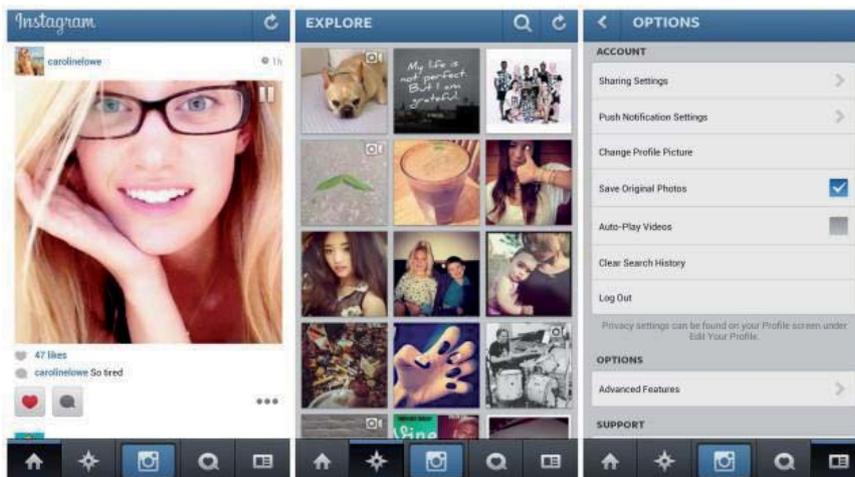


Figure 2.12. Snapshots of Instagram

2.4 College Graduate Employees

A typical college graduate employee generally works in an office or cubicle. Another term used for college graduate employee is “white collar”. This term derived from workers’ dressing like white shirts in Western countries in nineteenth and twentieth century. Most of the college graduate employees work in professional, managerial or administrative positions (Morse, 1953).

College graduate employees generally work in full time jobs. Full-time employees usually work 40 hours per week and at least five days in Turkey (Camkurt, 2007). They are trained and highly skilled professionals and salaried professional. Their employment varies from a clerical work to highly educated work. Examples of white-collar employees are accountants, attorneys, engineers, architects and academicians, in addition they have at least a baccalaureate degree from a college (Bain & Price, 1972).

Since, college graduate employees work in office or cubicle, they spend one third of their daily life in their workplace sedentarily. The lack of physical activity causes health problems diabetes, obesity and in long term cancer is observed (Castillo-Retamal & Hinckson, 2011; Leslie et al., 2013). In addition, computer effects eyes, keyboard effects wrists and also neck and back problems are observed (Blangsted, Sjøgaard, Hansen, Hannerz, & Sjøgaard, 2008; Kannel & Sorlie, 1979). Health promotion programs need to be designed for college graduate employees, considering office environment and utilities in office environment.

2.5 Sex and Health

Recent studies showed that there is a sex-based inequality in health (Denton, Prus, & Walters, 2004). In mortality, on an average, women live 5 years longer, but tend to get ill more frequent than man (Apfel, 1982). Furthermore, women face with higher levels of depression, distress and chronic diseases than men (Baum & Grunberg,

1991). On the other hand, men have higher rates of fatal illnesses and injuries than women (Verbrugge, 1985b).

Health promotion behaviors also differ in terms of sex. For instance, men consume more alcohol than women and women smoke less than man. On the contrary, women are not more successful than men on quitting smoking (Macintyre et al., 1996; Shumaker & Hill, 1991).

About physical activity, women participate physical activity for appearance related reasons. On the other hand, men place less importance on appearance (Azevedo et al., 2007; Troiano et al., 2008). In addition, women tend to participate in “timed” exercises such as treadmill, running etc., however men are more likely to participate social sports activities (Lee, 2005).

These explained differences in terms of sex showed that health promotion or health care system should be designed under these findings.

2.6 Exercise Stages of Change and Health

The study showed that moderate exercise reduce the risk of diabetes and blood sugar, starting to rise (Nehlsen-Cannarella et al., 1991). Also, exercise encourages weight loss in participants of moderate exercise. Exercise also decreases the risk of heart disease. At this point, the relation between exercise and health differ in terms of intensity of exercise. Moderate exercise protects heart and vigorous exercise show slightly more benefits (Adamu, Sani, & Abdu, 2005).

Moreover, Young-Ho explained that mental health variables and exercise behavior significantly correlated (Kim, 2004; Taylor et al., 1985). Studies showed that aerobic exercises such as walking, gardening and swimming reduce anxiety and depression (Guszkowska, 2003). In addition, physical activity improves self-esteem and

cognitive work and also lessen symptoms like low self-esteem and social extraction (Stathopoulou, Powers, Berry, Smits, & Otto, 2006).

Exercise stages of change is a model that assesses level of readiness to participate exercise (Marcus & Owen, 1992). There are five stages in this model; precontemplation, contemplation, preparation, action and maintenance (Marcus & Simkin, 1994).

As a result, the relation between exercise, exercise stages of change and health shows that it should be considered to design the health promotion programs and systems in terms of exercise stages of change.

2.7 Daily Time Slots and Health

Activities of daily living are defined as the activities needed for self-care. The activities of daily living are classified into two groups; basic activities of daily living and instrumental activities of daily living (Foti & Kanazawa, 2006).

Basic activities of daily living cover self-care tasks, movement in bed, transfers, locomotion, dressing, personal hygiene and feeding. In detail, sitting, rising and moving around bed are defined as “movement in bed”, changing position or moving one seat to another or moving from toilet to bed are called as “transfers”, walking down or upstairs are defined as “locomotion”, putting dress on, or socks, clothing upper body or lower body is defined as “dressing”, washing face, trunk or any part of body is explained as “personal hygiene” and eating, drinking are called “feeding” (Foti & Kanazawa, 2006; Spector, Katz, Murphy, & Fulton, 1987).

Instrumental activities of daily living are allowing individual live independently in population or community. These activities are housework, taking medications, managing expenses, shopping, communicating, and using technology, transportation with the community (Foti & Kanazawa, 2006; Katz, 1983).

As explained above activities of daily living differs in terms of time of day. Such moving from bed, waking up or transferring to work or home. Feeding three main meals means different time slots of day and nutritional needs differ.

CHAPTER 3

METHOD

This chapter focuses on the methodological procedure of the study. Overview of the study and research method will be explained in five sections; Study Design and Sampling, Participants, Data Collection Procedures, Data Collection Instruments and Data Analysis.

3.1 Study Design and Sampling

Mixed method was used in this study by using both quantitative and qualitative methods (Creswell, 2002). Quantitative methods included data collection by surveys (for demographic characteristics, exercise stages of change and health promotion characteristics). Semi structured interview method was used for the qualitative data collection in this study (Figure 3.1).

Initially, 326 college graduate employees were reached working in Ankara. These individuals were working on universities, public offices and private companies. They completed an online survey by Survey Monkey web service (Figure 3.2). By examining the sex and exercise stages of change data, five women and five men participants were randomly selected for exercise stages including Contemplation (Stage 2), Preparation (Stage 3), Action (Stage 4) and Maintenance (Stage 5). Stage 1 of the exercise stages (Pre-Contemplation) did not selected due to this group' no intention to participate in exercise in the future (Marcus, 2009).

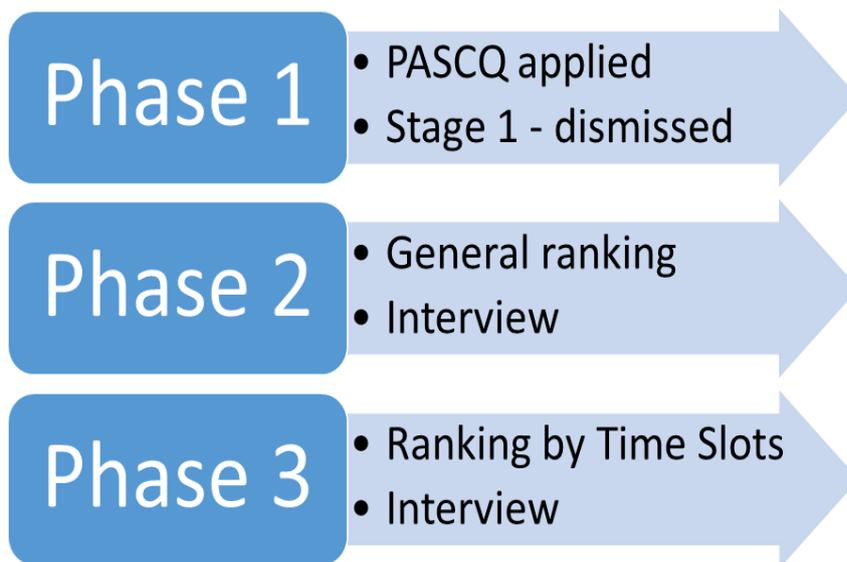


Figure 3.1. Design of the study

3.2 Participants

Participants were 40 college graduate employees (20 women and 20 men) working on a full-time job at least 5 days a week. The ages of the participants were between 25-35 years old ($M=30.10$, $SD=3.30$).

3.3 Data Collection Procedures

Before the study, Middle East Technical University Human Ethics Committee granted ethical approval (Appendix A). After that, volunteer participants completed the online surveys including Demographic Variables (sex and age) and Physical Activity Stages of Change Questionnaire. Then randomly selected 40 participants by their exercise stages of change were invited for interview.

During the interviews, participants firstly examined six cards (persona cards), each depicting the six health promoting behaviors. During this time, none of the questions of participants related to persona cards were answered. The reason of this was avoiding interaction effect of testing or manipulating the needs of the participants.

Secondly, they are directed to rank the persona cards with respect to perceived importance for themselves. Thirdly, the researcher asked three questions to participants; 1) the rationale behind his/her ranking, 2) give examples of problems that you faced about each support dimension, 3) provide solutions for each problem that you faced.

Thirdly, participants ranked the persona cards with respect to each given time slots [duration between waking-up and leaving home (T1), duration of transportation to work (T2), duration at work (T3), duration of lunch break (T4), duration of transportation to home (T5), duration at home before going bed (T6), duration of sleeping (T7), duration of non-routine days (T8)]. At this stage, researcher asked 4 questions to participants about each given time slots; 1) expectations for the ranked health promotion support dimension in the each given time slots, 2) give examples of problems that you faced about health promotion support dimension in the each given time slots, 3) provide solutions for each problem that you faced, 4) preferred methods of communicating the health promoting behavior support dimensions for each given time slots.

Total length of each interview was approximately 30-45 min. All interviews were voice recorded and transcribed.

3.4. Data Collection Instruments

3.4.1 Physical Activity Stages of Change Questionnaire (PASCQ)

Physical Activity Stages of Change Questionnaire (PASCQ) was used to examine the exercise stages of change. Exercise stages of change explains the person's motivational readiness for physical activity (Marcus & Owen, 1992). In the questionnaire, four questions are asked to assess each individual's exercise stage of change by a binary type of scale (yes/no). According to their answers, the participants are classified on five different stages. These stages are Pre-

contemplation (not participate regular physical activity and has no intention to participate in future), Contemplation (not participate regular physical activity and has an intention to participate in future), Preparation (has just started to regular physical activity), Action (participate in regular physical activity longer than 1 month, less than 6 months) and Maintenance (participate in regular physical activity longer than 6 months). The original scale is in English (Marcus, 2009). Turkish version of the questionnaire which is validated by Cengiz, İnce and Çiçek (2009) was used in the current study (ICC = .80) (Cengiz, Ince, & Cicek, 2009) (Appendix B).

3.4.2 Persona Cards

For the each of six health promoting behaviors a persona card was prepared. The basis for the six persona cards were wellness dimensions and a previously prepared health promoting behavior scale by Chen (Chen et al., 2003; Hettler, 1979; Roscoe, 2009). Six health promoting behaviors included Exercise Behavior Support, Nutrition Behavior Support, Health Responsibility Support, Social Support, Life Appreciation Support and Stress Management Support (Chen et al., 2003).

A group of experts (five experts) in health promotion and physical activity (two), nutrition (one), and industrial design (two experts) examined the health promoting behavior dimensions. Researcher and one of the design expert prepared the initial form of the persona cards which are depicting the each behavior dimension. Thirdly, initial form of the persona cards were examined by the above mentioned five experts and final forms were prepared by mutual agreement (Figure 3.4).

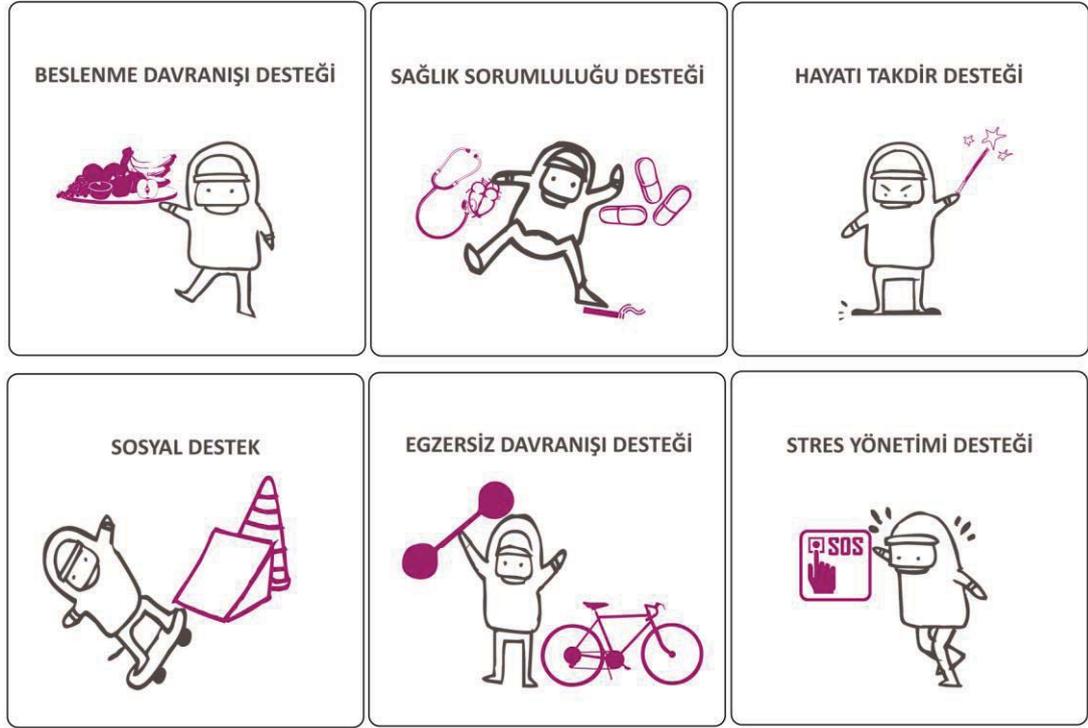


Figure 3.3. Persona cards on support dimensions

3.5 Data Analysis

Initially, interview data was coded by content analysis methods (Creswell, 2002). Coders read and re-read the transcriptions of the voice records. Then, coders coded the meaningful part of the transcripts based on the study purposes. Then, by using the codes, interview content was interrelated for ranking of each health promoting behavior dimensions by sex, exercise stages changes and daily time slots (Table 3.1 and Table 3.2). Frequencies are calculated and presented in tables by sex, exercise stages changes and daily time slots.

For the trustworthiness, two independent coders coded data independently. Then, they met and checked the codes for the agreement on the conflicts. After their agreements, coded data was used. Intra-coder agreement in a two month time span was .96.

For ranking of persona cards, 6 point was given for the 1st rank (e.g. if the exercise behavior persona card ranked first – most important, its value was 6) and 1 point was given for 6th rank (e.g. if the life appreciation behavior persona card ranked first – least important, its value was 1). The rankings were analyzed with respect to total scores of each support dimension.

Quantitative data including each participants PASCQ scores, persona card rankings by sex, exercise stages of change and daily time slots analyzed by descriptive statistics. In order to understand group differences by sex on health promoting behavior support dimension rankings Mann Whitney U test was used. Effects of stages of change and daily time slots on health promoting behavior support dimension were analyzed by Kruskal Wallis test ($p < .05$). The reason for using nonparametric analysis was the small sample size and the type of data (ordinal).

Table 3.1 Example of coding (General Ranking)

Comment	Card	Rank	Reason/Rationale	Problem	Design Solution
I think health is very important. Because other dimensions will not matter if we're not healthy, so I'd like to be supported on health responsibility	HR	1	desire to maintain health status	inability to place importance for health	motivation for health responsibility
Because of my job, I and my husband also live apart from the fact that I have stress due	SM	2	desire to cope with stress	inability to solve daily problems	solutions for problems
I got nutrition support ahead of exercise support. Doing exercise does not make sense unless you have a healthy diet	NB	3	desire to change nutrition behavior	inability to control the calorie balance	cooperated support of nutrition and exercise support
Form, just eating healthy you cannot be fit with 3 meals a day, exercise plays more important role. Just nutrition can provide weight management	NB	3	desire to manage body weight	inability to promote physical wellbeing	cooperated support of nutrition and exercise support
It is important for me to maintain my weight. By gaining weight you can lose your health and changes in appearance cause stressful situations	SM	2	desire to overcome stress	inability to cope with stress caused by lack of physical wellbeing	cooperated support of nutrition and exercise support
Social support may contribute to manage stress. It is good to attend different social activities	SS	5	desire to manage stress level	inability to cope with stress	customized suggestions on social activities/motivation for social activities
Exercise support have positive health effects of exercise for this reason I would like to be supported	EB	4	desire to promote health status	inability to promote physical wellbeing	motivation for physical activity
Getting Life Appreciation Support is important for feeling happy but support must be reality based	LA	6	desire to appreciate life	inability to realize virtual life appreciation support	reality in life appreciation support

Table 3.2 Example of coding (Time Slots part)

Comment	Card	Time Slot	SoC	Sex	Reason/Rationale	Problem	Solution	Interaction	Via
Showing the way on breakfast that will keep me energized all day long is all I need on Nutrition Behavior Support	NB	T1	4	F	desire to be more energetic	inability to be conscious about nutrition behavior	awareness on nutrition	prescriptive personal information	smartphone
My job is intense, stressful, that makes Stress Management Support rank in the top	SM	T1	4	F	desire to be motivated for work	inability to overcome stress	motivation	audio stimulus	smartphone
Stress Management Support can motivate on way to work	SM	T2	4	F	desire to be motivated for work	inability to overcome stress	motivation	audio/visual stimulus	smartphone
Providing recommendations may be related to people's personalities here in terms of Social Support, here I'd like to improve my communication with other people	SS	T3	4	F	desire to improve communication	inability to have personal information about others	information about social environment	instant audio/visual stimulus	wearable device
My Health is deteriorating because of my stress at work, so I'm interested in Health Responsibility Support	HR	T3	4	F	desire to have no disease	inability to protect health status	information about health status	mobile medical support	wearable device

CHAPTER 4

RESULTS

In this study, main purpose is to examine technology based health coaching needs of college graduate employees in terms of sex, exercise stages of change and daily time slots. In order to revisit, data analysis will present the answers of;

1. What are the college graduate employees' technology based health coaching needs in terms of sex, exercise stages of change and daily time slots?
2. Do the college graduate employees' technology based health coaching needs differ in terms of sex?
3. Do the college graduate employees' technology based health coaching needs differ in terms of exercise stages?
4. Do the college graduate employees' technology based health coaching needs differ in terms of daily time slots?

4.1. Research Question 1: What are the college graduate employees' technology based health coaching needs in terms of sex, exercise stages of change and daily time slots?

Sex

In this part, needs analysis was conducted with respect to sex. Figure 4.1, and Figure 4.2 showed the rankings for women and men respectively. Results were also given for each support dimension of technology based health coaching and examination on sex basis.

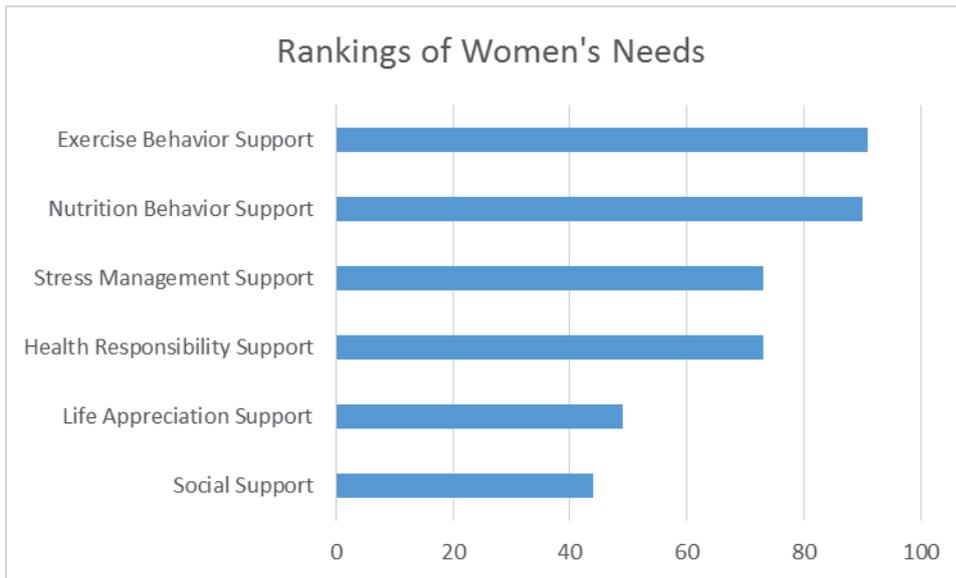


Figure 4.1 Ranking for women (total score for ranking)

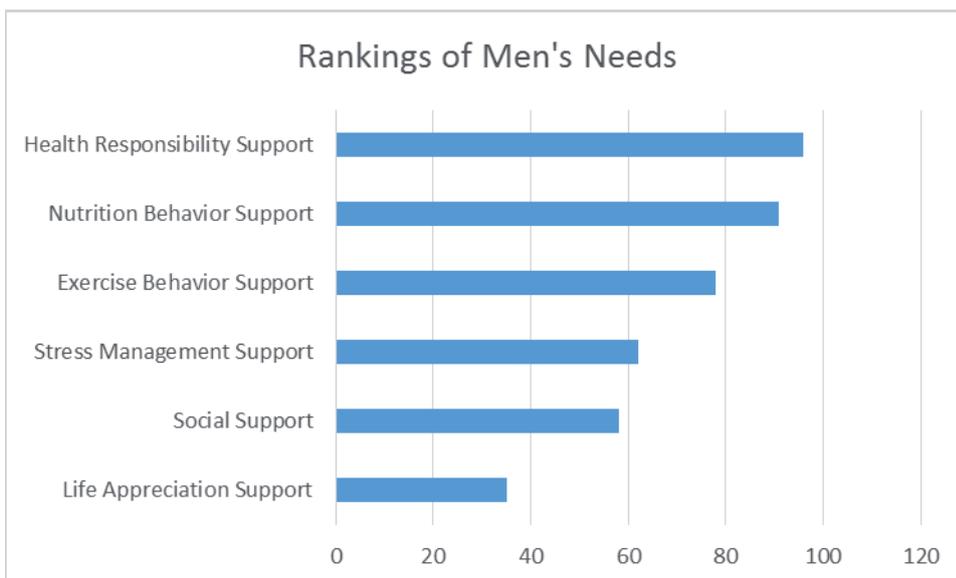


Figure 4.2 Ranking for men (total score for ranking)

The results showed that women placed “Exercise Behavior Support” for the 1st place. “Nutrition Behavior Support” was the 2nd, “Stress Management Support” was the 3rd, “Health Responsibility Support” was the 4th, “Life Appreciation Support” was the 5th and “Social Support” was the 6th. On the other hand, men placed “Health Responsibility Support” for the 1st place. “Nutrition Behavior Support” was the 2nd,

“Exercise Behavior Support” was the 3rd, “Stress Management Support” was the 4th, “Social Support” was the 5th and “Life Appreciation Support” was the 6th.

Exercise Behavior Support

Frequency of comments for exercise behaviors support showed that participants desired to promote physical wellbeing at first place. They needed exercise behavior support to be conscious about exercise behaviors; to be motivated for physical activity and exercise and to manage body weight, respectively (Table 4.1). The number of comments presented that only women participants need exercise behavior to manage body weight.

The difference between women and men was apparent by the reasons behind their choices. For instance, both men and women stated that they felt inability to be conscious about exercise behaviors, therefore they desire to promote physical wellbeing (Table 4.1). On the other hand, men explained main problem as lack of motivation for exercise, while women felt more inability to be physically active. When participants were asked about design solutions, men stated that to be motivated (by technology based health coaching), to have the knowledge on exercise behaviors, preferred to get an easy to reach customized database and corporate support of nutrition and exercise behaviors. On the other hand, while women expected more visual, intrusive, reminder and personal feedbacks, men expected to have prescriptive personal workouts.

The second reason for need of “Exercise Behavior Support” was desiring to be conscious about exercise behaviors (Table 4.1). After examining inability about consciousness on exercise behaviors, findings showed that lack of knowledge on exercise and lack of motivation for exercise are main problems of desiring to be conscious about exercise behaviors. In addition, men had lack of motivation exercise as a result of unconsciousness on exercise behavior. In addition, men and women differed in design solutions, women preferred to have support pre-exercise as having

prescriptive workouts and tips, during exercise by having audio, visual tips about how they perform the exercise. On the other hand, men preferred just tips and case specific feedback on knowledge during exercise especially by audio stimulus.

The third reason why participants needed “Exercise Behavior Support” is to be motivated for physical activity (Table 4.1). The inabilities differ strongly between women and men about motivation. Women had lack of motivation for physical activity with a relation of psychological state, on the other hand men felt lack of motivation as a result of lack of knowledge on exercise. Custom databases and to the point tips on exercise were esteemed by both women and men. Women preferred intrusive reminders for exercise and physical activity, men preferred prescriptive personal workouts or having information about friends sports activities. In addition, men explained that monitoring their physical activity and exercise increases their level of motivation.

The last reason of need for “Exercise Behavior Support” was to manage body weight (Table 4.1). Only women wanted to manage their body weight by exercise behavior support. They explained that lack of physical activity and lack of knowledge affects negatively managing body weight. They preferred to have custom visual database and intrusive stimulus from technology based health coaching system on managing body weight.

Health Responsibility Support

The qualitative analysis results showed that participants needed “Health Responsibility Support” to prevent health, to promote health status and to change health responsibility behaviors, respectively. The problems about preventing health status were inability to prevent health status, inability to change their health responsibility behaviors and inability to be conscious about health responsibilities (Table 4.1). On design solution, women preferred a personal check-up system by a mobile device but they only wanted to use this system at home. On the other hand, men preferred to monitor their vital signals by a mobile device which they could carry it everywhere.

The second reason why people need “Health Responsibility Support” was to promote health status (Table 4.1). There were two major problems about promoting health status; lack of motivation for changing health responsibility behaviors and inability to be conscious about health responsibility behaviors. In the design solutions, women preferred report of vital signals, log of menstrual cycle, medical tips on a visual platform especially from computer at work. Men suggested solutions about gathering information about health responsibility behaviors such as; health responsibility tips and reminder from a mobile platform in an intrusive way.

The third reason why people need “Health Responsibility Support” was to change health responsibility behaviors (Table 4.1). The inabilities about changing health responsibility behaviors were having lack of motivation to change health responsibility behaviors and inability to be conscious about health responsibilities. Women and men preferences differed about these problems solution. Women preferred visual stimulus about unhealthy behaviors such as nutritional information on credit card bill or barcode, on the other hand men preferred personal health responsibility tips by an application or audio tips while driving car.

Life Appreciation Support

Although life appreciation support had lower rank in the ranking of importance of support dimensions, the results showed that “Life Appreciation Support” did not differ between women and men (Table 4.1). The major reasons were desiring to realize positive side of life and to appreciate life. Participants mostly had problems on realizing positive side of life about three major issues; inability to motivate own-self, inability to realize positive side of life and inability realize daily achievements. Both women and men preferred to have a report of daily achievements but women preferred audio and men suggested visual report. In addition, men expected to have tips on appreciating life.

The second reason why people need “Life Appreciation Support” was desiring to appreciate life (Table 4.1). Same problems with inability to realize positive side of life observed here; inability to motivate own self, inability to realize positive side of life and inability realize daily achievements. Women did not consider about work related issues for design solutions, they needed audio stimulus to boost their emotional status, a song or prompts. Men still needed a report of achievements about job in a visual report and personal relaxing stimulus for overcoming stress.

Nutrition Behavior Support

The results show that there were three main reasons why participants needed “Nutrition Behavior Support”; desire to change nutrition behavior, desire to promote health status and desire to be conscious about nutrition behavior (Table 4.1). In order to make changes nutrition behavior people faced with two main problems; inability to motivate own self to change nutrition behavior and inability to be conscious about nutrition behavior. The design solutions differed between women and men, women preferred only visual tips on healthy nutrition behavior and healthy receipts. Men preferred prescriptive personal nutrition information in a visual way by smart phone.

The second major reason of need was to promote health status (Table 4.1). The problems about promoting health were inability to change nutrition behavior and inability to be conscious about nutrition behavior. The design solutions differed as women preferred to have visual tips on healthy nutrition behavior, but men preferred to have motivational stimulus on healthy nutrition behavior in audio type.

The third reason for need was to be conscious about nutrition behavior (Table 4.1). In the design solutions, both women and men chosen to have prescriptive personal nutrition information in a visual way, in addition men wanted to have reminder type intrusive stimulus.

Stress Management Support

There was just one reason why participants needed “Stress management support” was to desire overcome stress (Table 4.1). The problems were inability to manage stress level and inability to solve problems. Both women and men had inability to manage stress, but only women had inability to solve daily problems. In the design solutions, both women and men preferred visual plans about time and work and also for daily activities. In addition, men preferred audio and visual relaxing stimulus when stress level is critical.

Social Support

Desiring to be physically active and desiring to manage emotional status were the two reasons of why participants needed “Social Support” (Table 4.1). Mostly, participants needed “Social Support” for managing emotional status. In this subject, participants wished for solving these three problems; inability to have to the point suggestions, inability to realize positive side of life and inability to be motivated for social plans. Both women and men preferred prescriptive personal suggestions for possible social activities on a visual platform. Moreover, men needed audio suggestions about friends and colleagues for effective communication.

The other reason of need for “Social Support” was being physically active. Mostly men demanded on “Social Support” to solve lack of motivation for having social plans and inability to have information about friends’ sports activities. Men favored to have information about friends’ sports activities and planner for sports activities with other people.

Table 4.1. Summary of results for sex

	F	M	Why?	F	M	Problem	Specific Solution (Female)	Specific Solution (Male)
Exercise Behavior Support	4	0	desire to manage body weight	2	0	inability to be conscious about exercise behavior	visual, intrusive	
				2	0	inability to be physically active		
	11	11	desire to promote physical wellbeing	5	6	inability to be conscious about exercise behavior	visual, intrusive, reminder, personal	prescriptive personal workouts, visual
				2	5	inability to be motivated for exercise		
	5	6	desire to be conscious about exercise behaviors	4	0	inability to be physically active	audio, visual, prescriptive personal	instant coaching feedback
				5	4	inability to be conscious about exercise behavior		
2	3	desire to be motivated for physical activity	0	2	inability to be motivated for exercise	intrusive, reminder, prescriptive workouts	intrusive personal workouts, monitoring physical activity and exercises, information about friends sports activities	
			2	0	inability to be motivated for exercise			
Health Responsibility Support	3	1	desire to change health responsibility behaviors	3	1	inability to change health responsibility behavior	visual stimulus (credit card bill/barcode), audio intrusive stimulus by smartphone	personal health responsibility tips by smartphone, audio tips while driving
				0	1	inability to be conscious about health responsibilities		
	14	15	desire to prevent health	7	7	inability to prevent health status	personal medical checkup by smartphone but only at home	personal medical checkup by smartphone, report of vital signals
				3	5	inability to change health responsibility behavior		
	4	6	desire to promote health status	4	3	inability to be conscious about health responsibilities	report of vital signals, log of menstrual cycle, medical tips, to the point knowledge on health responsibilities	to the point health responsibility tips, reminders for health responsibility behaviors
				3	5	inability to change health responsibility behavior		
			1	1	inability to be conscious about health responsibilities			

Table 4.1. Summary of results for sex (continued)

Life Appreciation Support	11	11	desire to realize positive side of life	7	5	inability to motivate own self	report of daily achievements in audio, face to face talk for motivation,	tips on appreciating life by smartphone, report of daily achievements in a visual report
				1	3	inability to realize positive side of life		
Nutrition Behavior Support	3	2	desire to appreciate life	3	3	inability to realize daily achievements	audio stimulus for realizing positive side of life	report of achievements for appreciating job in a visual report, personal stimulus for overcoming stress
				1	1	inability to realize positive side of life		
	2	1	desire to be conscious about nutrition behavior	2	0	inability to motivate own self	prescriptive personal nutrition information-visual	prescriptive personal nutrition information-visual, audio stimulus for reminding such as tips on healthy nutrition
				0	1	inability to realize daily achievements		
Stress Management Support	15	11	desire to change healthy nutrition behavior	5	3	inability to be conscious about nutrition behavior	visual tips on healthy nutrition behaviors	prescriptive personal nutrition information-visual, audio stimulus for reminding such as tips on healthy nutrition
				10	8	inability to change nutrition behavior		
	8	6	desire to promote health status	5	1	inability to motivate own self to change nutrition behavior	audio motivation for healthy nutrition behaviors	prescriptive personal nutrition information-visual, audio stimulus for reminding such as tips on healthy nutrition
				3	5	inability to be conscious about nutrition behavior		
22	14	desire to overcome stress	15	11	inability to change nutrition behavior	visual plans about daily act. (dressing and time and work plan, relaxing audio stimulus at traffic, music	visual and audio time and work plan, relaxing audio and visual stimulus when the level of stress is critical	
			8	0	inability to manage stress level			
Social Support	1	4	desire to be physically active	0	2	inability to solve daily problems	visual suggestions on a social platform	information about friends sports activities, planner for sports activities, visual stimulus
				1	2	inability to motivate for having social plans		

Table 4.1. Summary of results for sex (continued)

7	6	desire to manage emotional status	2	1	inability to realize positive side of life	prescriptive personal suggestions for social activities visual platform	prescriptive personal suggestions for social activities, audio suggestions for effective communication
			2	5	inability to have to the point suggestions		
			2	1	inability to be motivated for having social plans		

Exercise Stage of Change

In this part, perceived needs of college graduate employees were analyzed in terms of exercise stages of change. Four stages of change; Stage 2 (contemplation), Stage 3, Stage 4, Stage 5 were explained.

Stage 2 (contemplation)

The results of the study showed that Stage 2 (contemplation) participants put “Health Responsibility Support” and “Nutrition Behavior Support” on the 1st place. “Exercise Behavior Support” had the 3rd place. Afterwards, Social Support, “Life Appreciation Support” and “Stress Management Support” got the 4th, 5th and 6th places respectively (Figure 4.3).

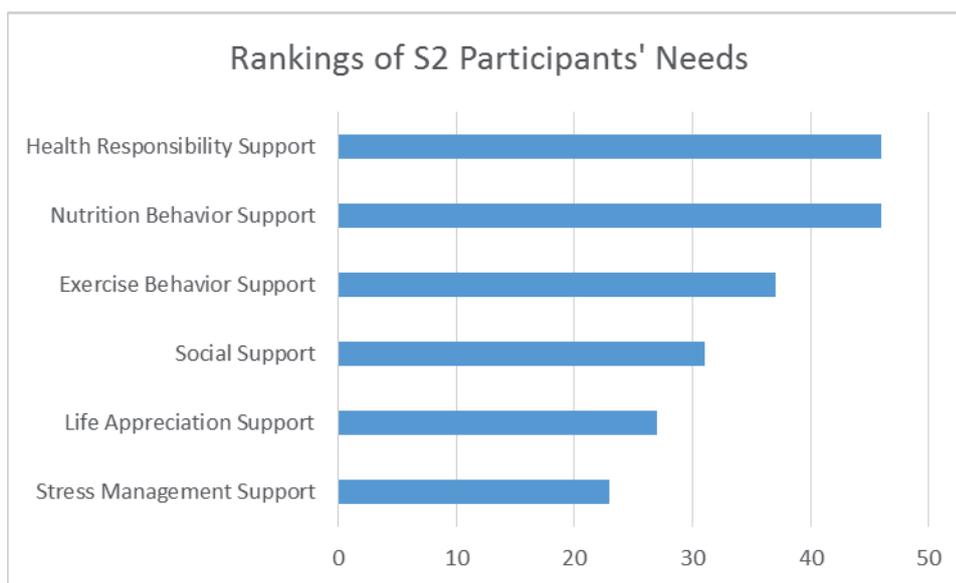


Figure 4.3. Ranking of Stage 2 participants (total score for ranking)

Health Responsibility Support

Stage 2 (contemplation) participants mentioned three main perceived needs on a “Health Responsibility Support” of technology based health coaching system. They

desired to prevent their health status, desired to promote health status and desired to change health responsibility behaviors (Table 4.2).

Participants at Stage 2 (contemplation) mostly suggested to have a mobile medical support in order to prevent their health status. The importance of this type support was to be mobile and easy to reach device or wearable. Another reason was participants desire to promote their health status by changing health responsibility behaviors. In order to solve this problem, participants suggested to get motivational stimulus for health responsibility behaviors (Table 4.2).

Stage 2 (contemplation) participants needed to be supported on health responsibilities to promote their health status (Table 4.2). Two main problems were described about these perceived needs, inability to change health responsibility behaviors and inability to be conscious about health responsibility behaviors. Participants recommended different solution about the related problems. For example, to change health responsibility behaviors, participants claimed to gain awareness on exercise and nutrition behaviors. Another problem was lack of knowledge on health responsibilities. As a solution, participants suggested to get a mobile medical support to make a check-up and gave information on health status, moreover they suggested to get motivational stimulus on changing health responsibilities such as quitting smoking (Table 4.2).

Final need on “Health Responsibility Support” was having major changes in health responsibility behaviors. All participants insisted on getting a motivational stimulus on quitting smoking and motivational stimulus on healthy nutrition behaviors (Table 4.2).

Nutrition Behavior Support

Stage 2 (contemplation) participants explained three major perceived needs on “Nutrition Behavior Support”. These three major perceived needs were desiring to

change nutrition behavior, desiring to promote health status and desiring to be conscious about nutrition behavior (Table 4.2).

First, Stage 2 (contemplation) participants needed “Nutrition Behavior Support” to change their nutrition behaviors. The reason behind this need was inability to change nutrition behavior and inability to be conscious about nutrition behavior. For solution of the problems, participants suggested two design solutions; getting motivational stimulus and being aware on nutrition behaviors (Table 4.2).

Second, participants needed “Nutrition Behavior Support” to promote their health status. At this point, they faced two types of problem; inability to change nutrition behavior and inability to be conscious about nutrition behavior. Participants suggested to get motivational stimulus on changing nutrition behavior and getting awareness on nutrition behavior to be conscious about nutrition behaviors.

Third, Stage 2 (contemplation) participants desired to be conscious about nutrition behavior. In order to solve the problem, participants suggested two possible solutions. An easy to reach customized database on nutrition and gaining awareness on nutrition behaviors are the suggested solutions for participants’ problems about consciousness on nutrition behaviors (Table 4.2).

Exercise Behavior Support

Participants described three major perceived needs about “Exercise Behavior Support”. They desired to promote physical wellbeing and desired to be motivated for physical activity (Table 4.2).

Participants needed “Exercise Behavior Support” to promote their physical wellbeing. In this perspective, participants claimed two problems; inability to be conscious about exercise behavior and inability to be physically active. As a solution of not being conscious about exercise behavior, they suggested to have a personal

education to get awareness on exercise behavior on an online platform. In addition, they wanted to be motivated for being physically active (Table 4.2).

The second need on “Exercise Behavior Support” was being motivated for physical activity. Stage 2 (contemplation) participants explained two main problems; inability to be conscious about exercise behavior and inability to be motivated for exercise. In order to solve these two problems, participants prefer to have an easy to reach customized database on exercise behavior and personal motivation for being physically active (Table 4.2).

Social Support

Stage 2 (contemplation) participants mentioned two major perceived needs on “Social Support”. They desired to manage their emotional status and desired to realize positive side of life (Table 4.2).

Firstly, Stage 2 (contemplation) participants need a “Social Support” to manage emotional status. About this need, participants had two main problems; inability to realize positive side of life and inability to have to the point suggestions. For solution of these problems, Stage 2 (contemplation) participants suggested to get custom suggestions about social activities and sharing on social media (Table 4.2).

Secondly, participants of Stage 2 (contemplation) need “Social Support” to realize positive side of life. On this need, participants faced two problems, lack of information about friends and social environment and inability to realize positive side of life (Table 4.2). Participants suggested motivational stimulus for socialization and appreciating life.

Life Appreciation Support

In Stage 2 (contemplation), participants considered on two perceived needs. These perceived needs were clustered around having positive thought such as, desire to realize positive side of life and desire to appreciate life (Table 4.2).

Stage 2 (contemplation) participants have problems on realizing positive side of life and motivating own selves. Suggested possible solutions were about motivation; motivation for life appreciation and motivation for positive thought (Table 4.2).

Participants of Stage 2 (contemplation) also need “Life Appreciation Support” for appreciating life. In this manner, participants have two main problems. They have difficulty on realizing positive side of life and they have suggested to get a motivational stimulus for life appreciation. Another difficulty was about realizing daily achievements. Participants suggested to have a daily report of achievements on an online platform (Table 4.2).

Stress Management Support

Stage 2 (contemplation) participant need “Stress Management Support” just for one reason (Table 4.2). They desired to overcome stress by support of technology based health coaching. About this need, participants have two main problems. They have difficulty on managing stress level and solving daily problems. The suggested solutions for managing stress level were invisible stress management support, which detect level of stress and makes operation, custom stimulus which is a relaxing stimulus for individual and time and work plan for daily duties. Another problem was solving daily problems. For this problem, participants suggested to have a work and time plan and custom stimulus for managing stress level (Table 4.2).

Table 4.2. Summary of results for Stage 2

	F	M	Why?	F	M	Problem	Specific Solution (Female)	Specific Solution (Male)
Health Responsibility Support	3	3	desire to prevent health	3	1	inability to prevent health status	personal mobile medical support	motivational stimulus on health responsibilities and nutrition behavior
				0	2	inability to change health responsibility behaviors		
	2	0	desire to change health responsibility behaviors	2	0	inability to change health responsibility behaviors	motivational stimulus on smoking and healthy eating	
Nutrition Behavior Support	2	2	desire to promote health status	1	1	inability to change health responsibility behaviors	awareness on health responsibilities, mobile and visual	awareness on health responsibilities, mobile and visual and audio
				1	1	inability to be conscious about health responsibilities		
	3	2	desire to change nutrition behavior	2	1	inability to change nutrition behavior	motivational stimulus healthy eating	motivational audio stimulus and awareness creating stimulus
	1	1	desire to be conscious about nutrition behavior	1	1	inability to be conscious about nutrition behavior		
	0	2	desire to promote health status	0	1	inability to change nutrition behavior	easy to reach customized database on nutrition	creating awareness on healthy nutrition behavior
			0	1	inability to be conscious about nutrition behavior			
Exercise Behavior Support	3	2	desire to promote physical wellbeing	2	2	inability to be conscious about exercise behavior	visual awareness	audio visual stimulus
				1	0	inability to be physically active		
	1	2	desire to be motivated for physical activity	0	2	inability to be conscious about exercise behavior	motivational stimulus for being physically active	easy to reach customized database on exercise behavior
				1	0	inability to be motivated for exercise		
	0	1	desire to be conscious about exercise behaviors	0	1	inability to be motivated for exercise		motivational stimulus for being physically active

Table 4.2. Summary of results for Stage 2 (continued)

Social Support	1	3	desire to manage emotional status	1	1	inability to realize positive side of life	sharing on social platforms, customized suggestions on social activities/motivation for social activities	customized suggestions on social activities/motivation for social activities
	1	1	desire to realize positive side of life	0	2	inability to have to the point suggestions		
Life Appreciation Support	1	1	desire to realize positive side of life	1	0	inability to have information about friends	motivation for socialization for overcoming stress	motivation for life appreciation
	3	2	desire to realize positive side of life	0	1	inability to realize positive side of life		
	0	2	desire to appreciate life	1	2	inability to realize positive side of life	motivational stimulus visual	motivational stimulus audio
	0	2	desire to appreciate life	2	0	inability to motivate own self		
Stress Management Support	5	4	desire to overcome stress	0	1	inability to realize positive side of life		reporting daily achievement
				0	1	inability to realize daily achievements		
				3	3	inability to manage stress level	customized stimulus for managing stress, relaxing audio stimulus	time and work plan
	5	4	desire to overcome stress	2	1	inability to solve daily problems		

Stage 3 (preparation)

According to the ranking of persona cards results showed that Stage 3 (preparation) participants put “Nutrition Behavior Support” on the 1st place. “Stress Management Support” and “Health Responsibility Support” for the 2nd place. Afterwards, “Exercise Behavior Support”, “Social Support” and “Life Appreciation Support” had the 4th, 5th and 6th places respectively (Figure 4.4).

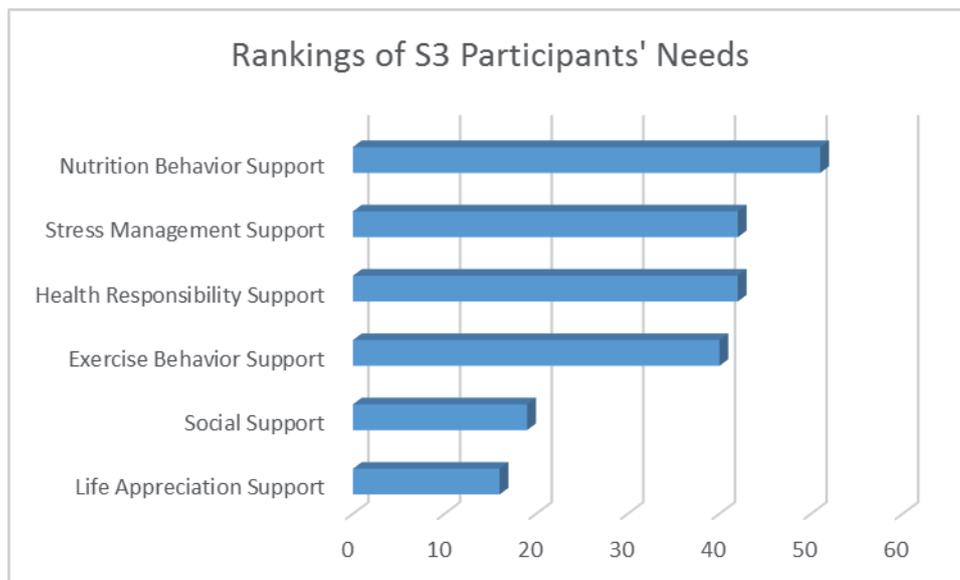


Figure 4.4. Ranking of Stage 3 participants (total score for ranking)

Nutrition Behavior Support

The highest importance was placed for “Nutrition Behavior Support” for Stage 3 (preparation) participants. They explained two major perceived needs about “Nutrition Behavior Support”. Participants desired to change their nutrition behaviors and desired to promote health status (Table 4.3).

Participants declared two main problem about changing nutrition behaviors; inability to be conscious about nutrition behavior and inability to change nutrition behavior. Suggested solutions for lack of consciousness were cooperated support of nutrition

and “Exercise Behavior Support” and getting awareness on healthy nutrition behavior (Table 4.3).

On the other hand, participants claimed two main problems on promoting their health status by nutrition behaviors. They had lack of knowledge about nutrition behaviors. Stage 3 (preparation) participants preferred to gain awareness on nutrition behaviors on an educational platform and get a cooperated support of nutrition and “Exercise Behavior Support”. Another problem they faced was having difficulty with changing nutrition behaviors. Participants preferred to solve this problem by getting awareness on nutrition behaviors (Table 4.3).

Stress Management Support

“Stress Management Support” have same ranking with “Health Responsibility Support” as 2nd place, which showed an equal importance was given for both these support dimensions. All participants at Stage 3 (preparation) need a support to overcome stress. They mainly explained two problems. These problems were inability to solve daily problems and inability to manage stress level (Table 4.3).

Stage 3 (preparation) participants declared that one of the problem they have faced was solving daily problems. Participants suggested two different solutions about problem. One of them was to have a time and work plan for daily duties and the other one was getting a cooperated support of nutrition and “Exercise Behavior Support” (Table 4.3).

Participants of Stage 3 (preparation) explained another problem as inability to manage stress level. On this problem, participants mentioned about four different design solutions. These possible solutions were time and work plan for daily duties, motivating stimulus for overcoming stress, customized stimulus for stress management and relaxing stimulus (Table 4.3).

Health Responsibility Support

“Health Responsibility Support” and “Stress Management Support” have the same rank as 2nd. Stage 3 (preparation) participants have three major perceived needs on “Health Responsibility Support”; desire to prevent health status, desire to change health responsibility behaviors and desire to promote health status (Table 4.3).

Major need of Stage 3 (preparation) participants was to prevent their health status. On preventing health status they mentioned about three main problems. First problem was inability to change health responsibility behaviors. Participants suggested a motivational status, cooperated support of nutrition and “Exercise Behavior Support” and preventive medical support for possible solutions of this problem (Table 4.3).

Another need of participants was changing health responsibility behaviors. Stage 3 (preparation) participants explained two problems about this need. One of them was inability to be conscious about health responsibilities. About this problem, they suggested to get a motivational stimulus for health responsibilities. Another problem was inability to change health responsibility behaviors. Participants had this problems explained the possible solution as creating awareness on health responsibilities (Table 4.3).

Final need on “Health Responsibility Support” was to promote health status. All Stage 3 (preparation) participants mentioned on just one problem which was inability to change health responsibility behaviors. Two possible design solutions was suggested. Both of them were on motivational aspect; motivational stimulus for unhealthy habits and motivational stimulus for health responsibilities (Table 4.3).

Exercise Behavior Support

Stage 3 (preparation) participants placed “Exercise Behavior Support” on 4th place of ranking. They talked about two major perceived needs on “Exercise Behavior Support”. Participants explained their perceived needs as desiring to promote physical wellbeing and desire to be motivated for physical activity (Table 4.3).

First need of Stage 3 (preparation) participants was desire to promote physical wellbeing. About this need, they had two major problems. The first one was inability to be conscious about exercise behavior. They all preferred to get awareness on exercise behaviors. Another problem was inability to be physically active. Participants suggested to get a motivational stimulus for being physically active and cooperated support of nutrition and exercise behavior support.

Second need of participants was desire to be motivated for physical activity. Inability to be motivated for exercise and inability to be conscious about exercise behavior were two problems of Stage 3 (preparation) participants. Participants suggested two possible solutions for this problem; motivational stimulus for exercise and creating awareness on exercise behavior (Table 4.3).

Social Support

Social Support had the 5th place on ranking of support dimensions. Participants of Stage 3 (preparation) explained three major perceived needs on “Social Support”. These perceived needs were declared as desire to manage emotional status, desire to realize positive side of life and desire to be physically active (Table 4.3).

The first need of Stage 3 (preparation) participants was to manage emotional status which can be described as managing level of stress by the participants. On this need, participants mainly had two problems. First problem was inability to realize positive side of life. In order to solve this problem, participants suggested to get a customized

suggestions on social activities. Another problem was inability to be motivated for attending social activities. For the solution, participants suggested to get an invisible stimulus for being motivated for social activities.

The second need of Stage 3 (preparation) participants was desire to realize positive side of life by the support of “Social Support”. About this need, participants had inability to realize positive side of life. As a solution, participants suggested to get a motivational stimulus for life appreciation and an invisible social support which gives information about social activities and social environment.

The third need of participants was desire to be physically active. Stage 3 (preparation) participants had just one problem about this need. The problem was inability to be physically active. They preferred to take a social motivation for physical activity (Table 4.3).

Life Appreciation Support

“Life Appreciation Support” placed as the 6th of ranking the support dimensions according to importance for participants. Stage 3 (preparation) participants mentioned on two major perceived needs on “Life Appreciation Support”. These perceived needs were desire to realize positive side of life and desire to appreciate life (Table 4.3).

The first problem of Stage 3 (preparation) participants who perceived needs to realize positive side of life was inability to motivate own self. Participants suggested to get motivational stimulus for appreciating life and report of daily achievements. The other problem they had faced was inability to realize daily achievements. Stage 3 (preparation) participants suggested monitoring of daily achievements as a possible solution of the problem.

The second need of Stage 3 (preparation) participants was desire to appreciate life. Inability to motivate own self and inability to realize positive side of life were problems the Stage 3 (preparation) participants faced. They had difficulty in figuring out “Life Appreciation Support” and suggested to get a reality in life appreciation support and motivational stimulus for appreciating life (Table 4.3).

Table 4.3. Summary of results for Stage 3

	F	M	Why?	F	M	Problem	Specific Solution (Female)	Specific Solution (Male)
Nutrition Behavior Support	4	3	desire to change healthy nutrition behavior	2	1	inability to be conscious about nutrition behavior	cooperated support of nutrition and exercise support, motivational audio stimulus for healthy nutrition behavior, keeping log of nutrition behavior	motivational visual and audio stimulus, awareness on nutrition
				2	2	inability to change nutrition behavior		
	4	2	desire to promote health status	3	2	inability to be conscious about nutrition behavior		
				1	0	inability to change nutrition behavior		
Stress Management Support	6	5	desire to overcome stress	4	3	inability to manage stress level	time and work plan, cooperated support of nutrition and "Exercise Behavior Support"	time and work plan
				2	2	inability to solve daily problems		
Health Responsibility Support	6	4	desire to prevent health	2	1	inability to change health responsibility behaviors	motivational stimulus for health responsibilities, preventive medical support and cooperated support of nutrition and exercise	creating awareness, preventive medical support and motivational stimulus for health responsibilities
				2	1	inability to be conscious about health responsibilities		
				2	2	inability to prevent health status		
	0	2	desire to change health responsibility behaviors	0	1	inability to be conscious about health responsibilities		
			desire to promote health status	0	1	inability to change health responsibility behaviors		
	0	2		0	2	inability to change health responsibility behaviors		

Table 4.3. Summary of results for Stage 3 (continued)

Exercise Behavior Support	4	4	desire to promote physical wellbeing	1	2	inability to be conscious about exercise behavior	motivational stimulus for physical activity, getting awareness on a visual platform	getting awareness on a visual platform, motivational stimulus for physical activity
				3	0	inability to be physically active		
	1	1	desire to be motivated for physical activity	0	2	inability to be motivated for exercise		
				1	0	inability to be motivated for exercise		
				0	1	inability to be conscious about exercise behavior		
Social Support	2	0	desire to manage emotional status	1	0	inability to realize positive side of life	customized suggestions on social activities/motivation for social activities, audio stimulus for life appreciation	audio or visual motivational stimulus for physical activity
	1	1	desire to realize positive side of life	1	0	inability to be motivated for having social plans		
	1	1	desire to realize positive side of life	1	1	inability to realize positive side of life		
	0	2	desire to be physically active	0	2	inability to motivate for having social plans		
Life Appreciation Support	1	4	desire to realize positive side of life	1	3	inability to motivate own self	monitoring daily achievements, reality in support, motivational stimulus	motivational audio stimulus
				0	1	inability to realize daily achievements		
	2	0	desire to appreciate life	1	0	inability to motivate own self		
				1	0	inability to realize positive side of life		

Stage 4 (action)

The results of rankings showed that Stage 4 (action) participants placed “Exercise Behavior Support” as 1st, “Health Responsibility Support” 2nd. Participant ranked “Stress Management Support” and “Nutrition Behavior Support” as 3rd. Afterwards, “Social Support” and “Life Appreciation Support” were the 5th and 6th dimensions of ranking Figure 4.5).

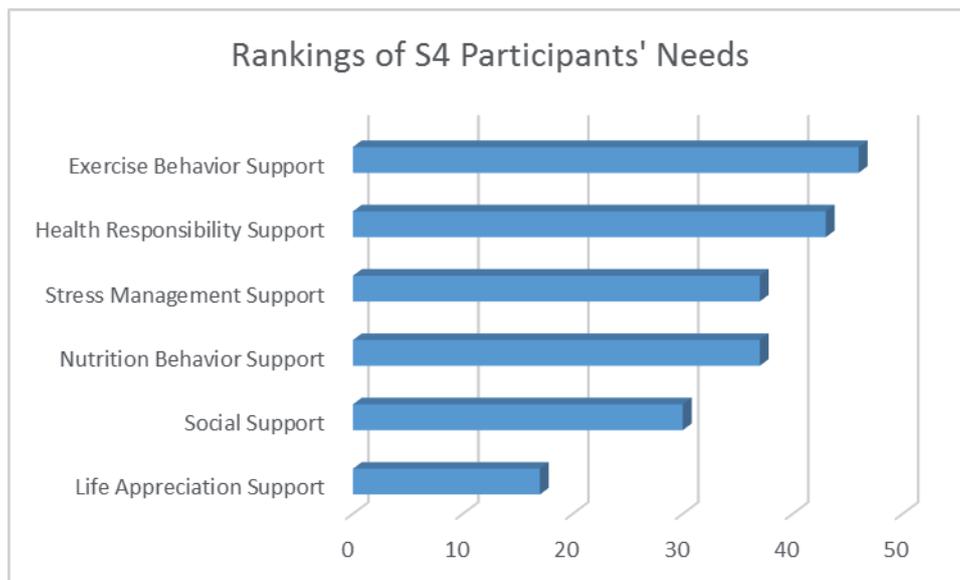


Figure 4.5. Ranking of Stage 4 (action) participants (total score for ranking)

Exercise Behavior Support

Stage 4 (action) participants placed the highest importance for “Exercise Behavior Support”. Participants mentioned about two major perceived needs on “Exercise Behavior Support”. The first need was desire to promote physical wellbeing and the second one was desire to be conscious about exercise behavior (Table 4.4).

The first need was about promoting physical wellbeing. They have mentioned on two problems; inability to be motivated for exercise, inability to be conscious about exercise behavior. They suggested different solutions about related problems. The

major solution was about lack of motivation. Participants suggested to get a motivational stimulus for exercise behavior. Other suggested possible solutions were customized awareness, easy to reach customized database and keeping log of physical activities and report them back (Table 4.4).

The second need was desire to be conscious about exercise behavior. Two problems were explained. Stage 4 (action) participants claimed that one of the problem was lack of knowledge on exercise behaviors and they suggested to reach an easy customized database on exercise behavior. The other problem was lack of motivation for exercise. Participants suggested to get a motivational stimulus for exercise (Table 4.4).

Health Responsibility Support

Stage 4 (action) participants ranked “Health Responsibility Support” on 2nd place between six different support dimensions. They all explained their perceived needs around their health status. Participants desire either to prevent their health status or to promote their health status (Table 4.4).

At first, participants need “Health Responsibility Support” for preventing their health status. About this need, they faced 3 different problems. The first problem was inability to prevent health status. Preventive medical support for creating instant solutions about health problems was the suggested solution for problem. The second problem was inability to be conscious about health responsibility behaviors.

Participants suggested to get personal information and tips on health responsibilities and preventive medical support for the problem. The third problem was inability to change health responsibility behaviors. Participants suggested to get a motivational stimulus for changing unwanted health responsibility behaviors such as quitting smoking (Table 4.4).

Stress Management Support

Stage 4 (action) participants placed “Stress Management Support” and “Nutrition Behavior Support” on the 3rd place. Participants declared that they need to get support from “Stress Management Support” in order to overcome stress (Table 4.4).

Stage 4 (action) participants mentioned on two problem about overcoming stress. They explained the problems as inability to manage stress level and inability to solve daily problems. Participants suggested four different solutions for managing stress level. They suggested to get customized stimulus, motivational stimulus, invisible stress management support and motivational stimulus for physical activity in order to managing their stress level. The other problem was about solving daily problems. Participants suggested to get motivational stimulus for appreciating life and prioritization for goals for solving daily problems (Table 4.4).

Nutrition Behavior Support

“Nutrition Behavior Support” and “Stress Management Support” had the 3rd place on ranking the relation between these two support dimensions discussed in discussion section. Participants explained their perceived needs by two different types. These perceived needs were desire to change nutrition behavior and desire to promote health status (Table 4.4).

The first need was changing nutrition behaviors. In this need, Stage 4 (action) participants mainly have two types of problem. The first problem was inability to be conscious about nutrition behaviors. Participants suggested to be supported on getting awareness on nutrition behavior and customized suggestions about nearby places for healthy eating (Table 4.4). The other problem was inability to change nutrition behavior, for a solution they preferred to have motivational stimulus.

Social Support

“Social Support” was placed on the 5th place by Stage 4 (action) participants. There were three major perceived needs from “Social Support”. These perceived needs were realizing positive side of life, being physically active and managing emotional status (Table 4.4).

Firstly, participants mentioned about being supported to realize positive side of life. Mainly, they explained two problems about this need. The problems were inability to have to the point suggestions and lack of motivation for attending social activities. As a solution for these problems, Stage 4 (action) participants suggested to get motivational stimulus for having social activities in order to overcome stress and customized suggestions for social activities (Table 4.4).

Secondly, Stage 4 (action) participants needed “Social Support” for being physically active. On this need, participants explained just one problem; inability to have information about friends’ sports activity plans. Having notifications about friends’ sports activities was suggested as a possible solution for problem.

At last, participants wanted to be supported on managing emotional status by “Social Support”. Lack of information on social activities was problem of this need and participants suggested to get customized suggestions on social activities (Table 4.4).

Life Appreciation Support

The least importance was given for “Life Appreciation Support” that was 6th on the ranking. Stage 4 (action) participants needed “Life Appreciation Support” for realizing positive side of life. They mentioned on two main problems. The first problem was inability to realize daily achievements. Participants suggested to get a report of daily achievements for solution of the problem. The second problem was

inability to motivate own self. Motivational stimulus, invisible support and report of daily achievements were suggested solutions for lack of motivation (Table 4.4).

Table 4.4. Summary of results for Stage 4

	F	M	Why?	F	M	Problem	Specific Solution (Female)	Specific Solution (Male)
Exercise Behavior Support	5	4	desire to promote physical wellbeing	2	1	inability to be conscious about exercise behavior	creating customized awareness on exercise behavior, easy to reach customized database on exercise behavior	keeping log of physical activities
	1	1		3	0	inability to be motivated for exercise behavior	motivational stimulus for physical activity audio	motivational stimulus for physical activity visual
			desire to be conscious about exercise behaviors	1	0	inability to be conscious about exercise behavior	easy to reach customized database on exercise behavior	
Health Responsibility Support			desire to prevent health	0	1	inability to be motivated for exercise		motivational stimulus for physical activity visual
	1	5		0	3	inability to prevent health status		customized instant solutions about health problems, preventive mobile medical support
				0	1	inability to change health responsibility behaviors		audio motivational stimulus for health responsibilities
	1	0	desire to promote health status	1	1	inability to be conscious about health responsibilities	personal information and tips on health	preventive mobile medical support
Stress Management Support			desire to overcome stress	1	0	inability to change health responsibility behaviors	motivation for quitting smoking	
	5	4		4	3	inability to manage stress level	customized stimulus for managing stress level	invisible stress management support, motivational stimulus for managing stress level
				1	1	inability to solve daily problems	motivational stimulus	goal prioritization

Table 4.4. Summary of results for Stage 4 (continued)

Nutrition Behavior Support	6	5	desire to change healthy nutrition behavior	3	3	inability to change nutrition behavior	motivational stimulus for healthy nutrition behavior	motivational stimulus for healthy nutrition behavior, customized visual suggestions on mobile phone
	2	1	desire to promote health status	1	1	inability to be conscious about nutrition behavior	creating awareness on nutrition behavior	customized suggestions about nearby places
				2	0	inability to change nutrition behavior	creating awareness on healthy nutrition behavior	
Social Support	2	0	desire to realize positive side of life	0	1	inability to be conscious about nutrition behavior		cooperated support of nutrition and exercise support
				1	0	inability to have to the point suggestions	motivational stimulus for socialization for overcoming stress	
	0	2	desire to manage emotional status	1	0	inability to motivate for having social plans	customized suggestions on social activities, motivational stimulus for social activities	
				1	2	inability to have to the point suggestions		customized suggestions on social activities, motivational stimulus for social activities
Life Appreciation Support	3	3	desire to realize positive side of life	1	1	inability to have information about friends	motivational stimulus for physical activity	motivational stimulus for physical activity
				1	2	inability to realize daily achievements	monitoring daily achievements	monitoring daily achievements
	3	3	desire to realize positive side of life	1	2	inability to motivate own self	invisible life appreciation support, motivation for life appreciation	monitoring daily achievements

Stage 5 (maintenance)

Stage 5 (maintenance) participants placed “Nutrition Behavior Support” for the 1st place. Afterwards, “Exercise Behavior Support” and “Health Responsibility Support” were placed as 2nd and 3rd respectively. Then, “Stress Management Support” got the 4th place. “Life Appreciation Support” got the 5th and “Social Support” got the 6th place (Figure 4.6).

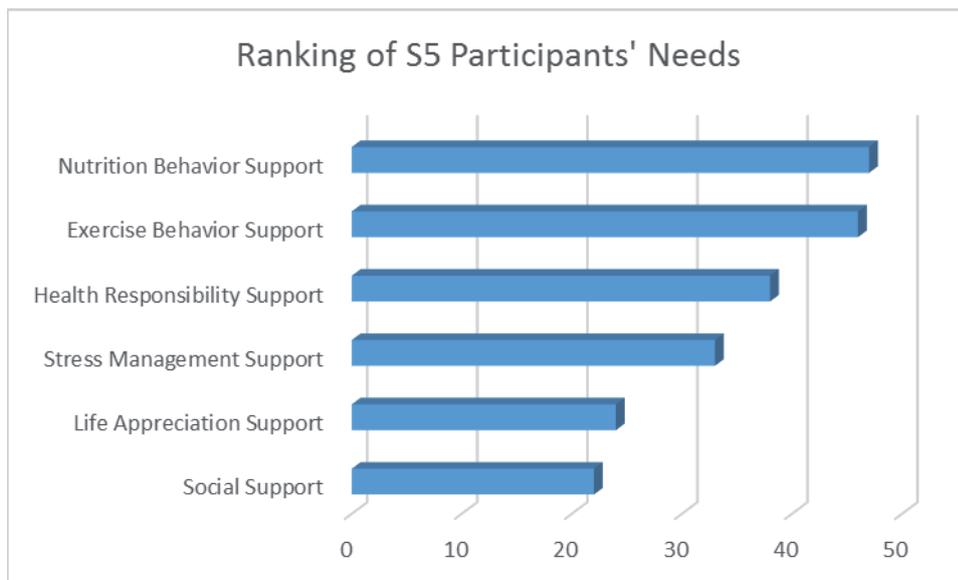


Figure 4.6 Ranking of Stage 5 participants (total score for ranking)

Nutrition Behavior Support

Stage 5 (maintenance) participants placed “Nutrition Behavior Support” for 1st rank. Participants discussed on two major perceived needs on “Nutrition Behavior Support”. These perceived needs were desire to change nutrition behavior and desire to promote health status.

Stage 5 (maintenance) participants need a support to change their nutrition behavior. They faced two problems. The first problem was inability to change nutrition behavior. Participants suggested to get motivational stimulus for nutrition behavior,

easy to reach customized database on nutrition, awareness on habits and customized stimulus about nutrition behavior. The second problem was inability to be conscious about nutrition behavior. Participants suggested to get customized suggestions about nutrition behavior (Table 4.5).

In addition, participants needed to be supported by “Nutrition Behavior Support” for promoting their health status. There were two problems that participants faced about nutrition behaviors. First problem was inability to change their nutrition behaviors to health promoting type. For promoting their health status participants suggested to get motivational stimulus for nutrition behavior and cooperated support of nutrition and “Exercise Behavior Support”. Second problem was inability to be conscious about nutrition behaviors. Participants preferred to take customized suggestions about nutrition behaviors as a solution of the problem (Table 4.5).

Exercise Behavior Support

Participants ranked “Exercise Behavior Support” on the 1st place. Stage 5 (maintenance) participants discussed their perceived needs on two main subjects. These perceived needs were declared as; desire to be conscious about exercise behavior and desire to promote physical wellbeing.

First, participants explained that they desire to be conscious about exercise behaviors. The problem on this need was inability to be conscious about exercise behavior. Surprisingly, participants suggested four different solutions. These suggested possible solutions were creating customized awareness on exercise behavior, ability to use an easy to reach customized database on exercise behaviors, customized stimulus about exercise behaviors and motivational stimulus for being physically active (Table 4.5).

Second, participants needed to be supported by “Exercise Behavior Support” in order to promote their physical wellbeing. About this need, they faced lack of knowledge

about exercise behavior and inability to be physically active. Participants suggested getting customized stimulus about exercise behavior and customized awareness on exercise behavior for solution of lack of knowledge problem. On the other hand, participants suggested to get motivational stimulus for being physically active (Table 4.5).

Health Responsibility Support

Stage 5 (maintenance) participants ranked “Health Responsibility Support” for 3rd place. During interview, participants explained three main reasons; desire to promote health status, desire to prevent health status and desire to change health responsibility behaviors.

At first, participants needed to be supported by “Health Responsibility Support” to prevent health status (Table 4.5). Participants explained their problem as inability to prevent health status. For possible solution, participants suggested to get personal information and tips on health responsibilities, customized instant solutions about health problems, easy to use customized health responsibility support and customized collaboration of exercise behavior and health responsibility support.

Secondly, participants declared that they needed to be supported for promoting health status. They have just one problem about this need. They had inability to change their health responsibility behaviors. Participants suggested cooperated support of nutrition and “Exercise Behavior Support” and motivational stimulus for health responsibility behaviors for possible solution of problem.

Third need was desire to change health responsibility behaviors. Participants had problems on changing health responsibility behaviors. Motivational stimulus for changing was suggested for a solution of the problem (Table 4.5).

Stress Management Support

Stage 5 (maintenance) participants ranked “Stress Management Support” as 4th in the ranking of the support dimension according to their importance. Participants mentioned on two major perceived needs; desire to realize positive side of life and desire to overcome stress.

First, Stage 5 (maintenance) participants’ major need was desire to overcome stress. Participants talked about two main problems. These problems were inability to manage stress level and inability to solve daily problems. First problem was about managing stress level. Participants suggested to get motivational stimulus for life appreciation, motivational stimulus for positive thought, customized stimulus for managing stress level and motivational stimulus for overcoming stress for solving the problem. Second problem was lack of organization for solving daily problems. Stage 5 (maintenance) participants suggested to get a time and work plan, goal prioritization and customized stimulus on stress management support (Table 4.5).

Second, participants needed to be supported by “Stress Management Support” to realize positive side of life. About this need, participants faced two problems. These problems were about solving daily problems and managing stress level. Time and work planning was suggested strongly by all participants commented on this problem (Table 4.5).

Life Appreciation Support

Stage 5 (maintenance) participants placed “Life Appreciation Support” on 5th place of ranking. They mentioned on two main perceived needs; desire to realize positive side of life and desire to appreciate life (Table 4.5).

Firstly, participant need to be supported for realizing positive side of life. They talked about three problems about this need. Main problem was inability to motivate own self. Participants preferred to get motivational stimulus for appreciating life and

motivational stimulus for positive thought. Another problem was inability to realize daily achievements. For solution, elimination of barriers for reaching goals or life assistance and report of daily achievements were suggested. Last problem was inability to realize positive side of life. Participants described that a motivational stimulus for appreciating life can be solution of this problem (Table 4.5).

Social Support

“Social Support” had the least importance for Stage 5 (maintenance) participants. This support dimension got the 6th place in the ranking. Three main perceived needs were discussed in this part, desire to manage emotional status, and desire to realize positive side of life and desire to be physically active (Table 4.5).

First, participants needed to be supported by “Social Support” for managing their emotional status. Two problems were explained. First problem was inability to have to the point suggestions about social activities. For solution, time and work plan, socializing by having group sports activities and customized suggestions on social activities were suggested by Stage 5 (maintenance) participants. Second problem was inability to be motivated for having social plans. Participants suggested to get time and work plan, and socialization by having group sports activities to solve this problem (Table 4.5).

Second, Stage 5 (maintenance) participants desire to positive side of life by support of “Social Support”. About this need, participants mentioned two problems. First problem was inability to realize positive side of life which can be solved by goal prioritization and inability be motivated for attending social activities. For second problem, participants suggested motivational stimulus on social activities and positive thought.

Third, participants needed to be supported for being physically active. They described just one problem that was inability to have information about friends. Motivational stimulus for attending physical activity was suggested as a solution (Table 4.5).

Table 4.5. Summary of results for Stage 5

	F	M	Why?	F	M	Problem	Specific Solution (Female)	Specific Solution (Male)
Nutrition Behavior Support	4	2	desire to change healthy nutrition behavior	3	2	inability to change nutrition behavior	easy to reach customized database on nutrition, awareness on habits, customized stimulus about nutrition behaviors	motivational stimulus for healthy nutrition behavior
	1	0	desire to be conscious about nutrition behavior	1	0	inability to be conscious about nutrition behavior	customized suggestions about nutrition behaviors	
	2	1	desire to promote health status	2	0	inability to change nutrition behavior	creating awareness on healthy nutrition behavior	
	4	4	desire to be conscious about exercise behaviors	4	4	inability to change nutrition behavior	cooperated support of nutrition and exercise support, motivational stimulus for nutrition behavior	
	2	0	desire to manage body weight	1	0	inability to be conscious about exercise behavior	easy to reach customized database on exercise behaviors, customized motivational stimulus	creating customized awareness on exercise behavior
	1	1	desire to promote physical wellbeing	1	0	inability to be conscious about exercise behavior	easy to reach customized database on exercise behaviors	
Exercise Behavior Support	4	3	desire to prevent health	1	1	inability to be physically active	motivational stimulus	
	1	1	desire to prevent health	1	1	inability to be conscious about exercise behavior	customized stimulus about exercise behaviors	creating customized awareness on exercise behavior
	4	3	desire to prevent health	1	1	inability to be conscious about health responsibilities	customized instant solutions about health problems	creating awareness on health responsibility
	1	2	desire to promote health status	2	1	inability to change health responsibility behaviors	preventive medical support	motivational stimulus for healthy nutrition behavior
Health Responsibility Support	1	2	desire to promote health status	0	2	inability to prevent health status behaviors	customized instant solutions about health problems	easy to use customized health responsibility support
	1	0	desire to change health responsibility behaviors	1	0	inability to prevent health status behaviors	Personal information and tips on health	cooperated support of nutrition and exercise support, motivational stimulus
	1	0	desire to change health responsibility behaviors	1	0	inability to change health responsibility behaviors	motivational stimulus for quitting smoking	

Table 4.5. Summary of results for Stage 5 (continued)

Stress Management Support	6	2	2	3	2	3	2	inability to manage stress level	motivational stimulus for positive thought, invisible stress management support	customized stimulus for managing stress level, motivational stimulus for overcoming stress
	2	2	desire to realize positive side of life	0	3	0	3	inability to solve daily problems	time and work planning, goal prioritization	
				1	0	1	0	inability to solve daily problems	time and work planning	
Life Appreciation Support	5	2	2	3	1	3	1	inability to manage stress level	motivational stimulus for positive thought	motivational stimulus for positive thought
				2	0	2	0	inability to realize daily achievements	Elimination for barriers for reaching goals, monitoring daily achievements	
				0	1	0	1	inability to realize positive side of life		motivational stimulus for life appreciation
Social Support	4	1	2	2	1	2	1	inability to have to the point suggestions	customized suggestions on social activities, motivational stimulus for having social activities	motivational stimulus for having social activities
	3	0	desire to realize positive side of life	2	0	2	0	inability to be motivated for having social plans	socializing by having group sports activities, time and work plan	
				2	0	2	0	inability to motivate for having social plans	motivational stimulus for positive thought and having social activities	
	0	1	desire to be physically active	1	0	1	0	inability to realize positive side of life	Goal prioritization	
				0	1	0	1	inability to have information about friends		motivational stimulus for physical activity

Daily Time Slots

In this part of study, the change in importance of support dimension with daily time slots were discussed. In the study, eight different time slots were preferred in order to identify the perceived needs of college graduate employees. These time slots were duration between waking-up and leaving home (T1), duration of transportation to work (T2), duration at work (T3), duration of lunch break (T4), duration of transportation to home (T5), duration at home before going bed (T6), duration of sleeping (T7), duration of non-routine days (T8).

Participants were asked for importance of each time slot. The results showed that participants mostly needed to be supported by technology based health promoting coach on duration of non-routine days (T8). Duration at home before going bed (T6) was the 2nd time slot and duration at work (T3) was the 3rd time slot according to the total scores for importance. In the 4th place duration of lunch break (T4) was ranked. Afterwards, duration between waking-up and leaving home (T1) was at 5th place, duration of transportation to home (T5) was 6th, duration of transport to work (T2) was 7th and duration of sleeping (T7) was the 8th on the ranking (Figure 4.7).

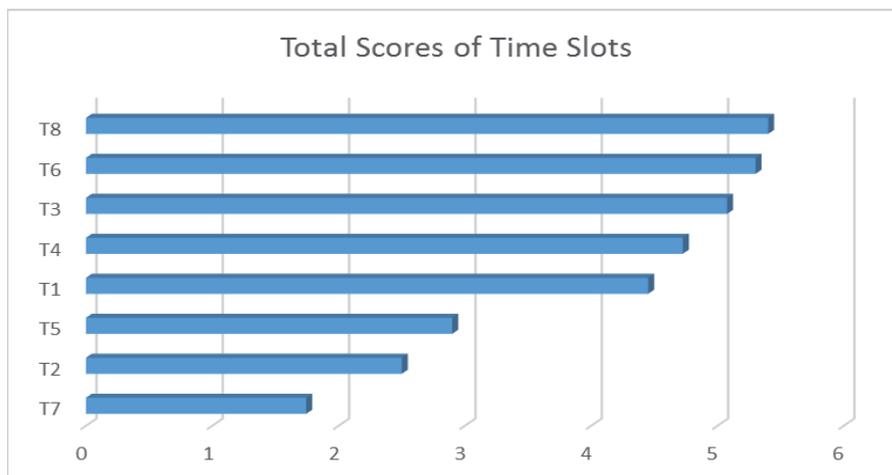


Figure 4.7. Ranking of time slots according to importance scores (total score for ranking)

The results showed that perceived needs of participants differ in terms of time slots.

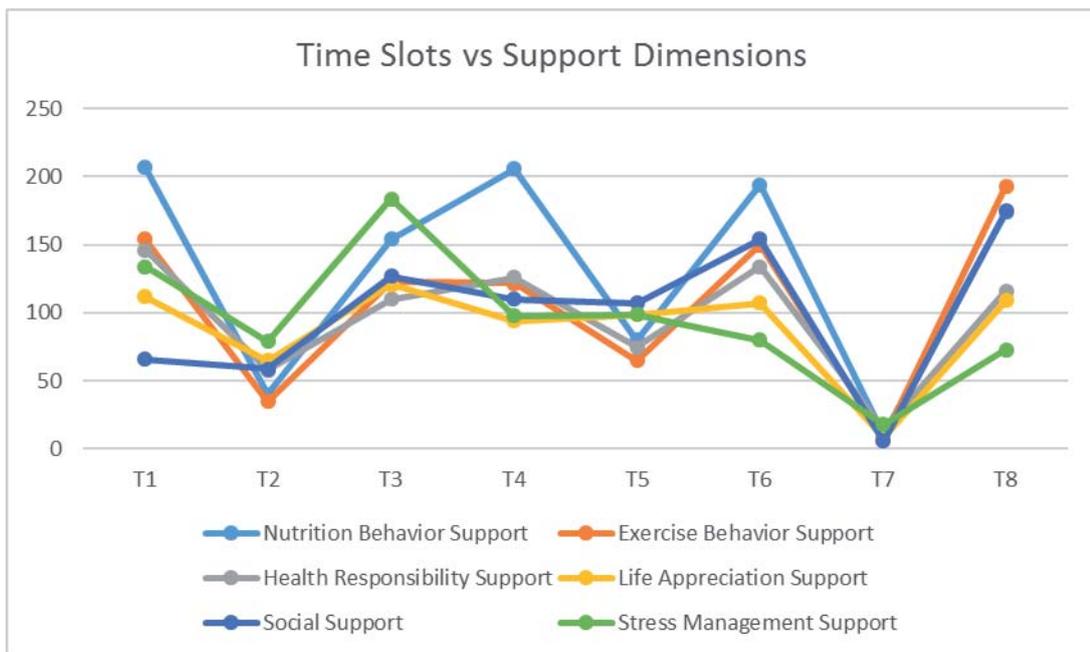


Figure 4.8. Time slots vs support dimensions (total score for ranking)

T1 - Duration Between Waking-up and Leaving Home

In this time slot, participants wake up and started their daily life. During this time slot, participants placed most importance on “Nutrition Behavior Support” and ranked this support dimension on 1st place. Participants ranked “Exercise Behavior Support” on 2nd, “Health Responsibility Support” on 3rd and “Stress Management Support” on 4th place. Afterwards, “Life Appreciation Support” was ranked as 5th and “Social Support” was ranked as 6th support dimension (Figure 4.9).

The major need from “Nutrition Behavior Support” was desire to eat healthier. About this need, major problem was lack of knowledge on nutrition behaviors. Participants suggested to get tips on nutrition and prescriptive meal plan. On designers perspective, participants preferred to take this support as a visual stimulus by their smartphone (Table 4.6).

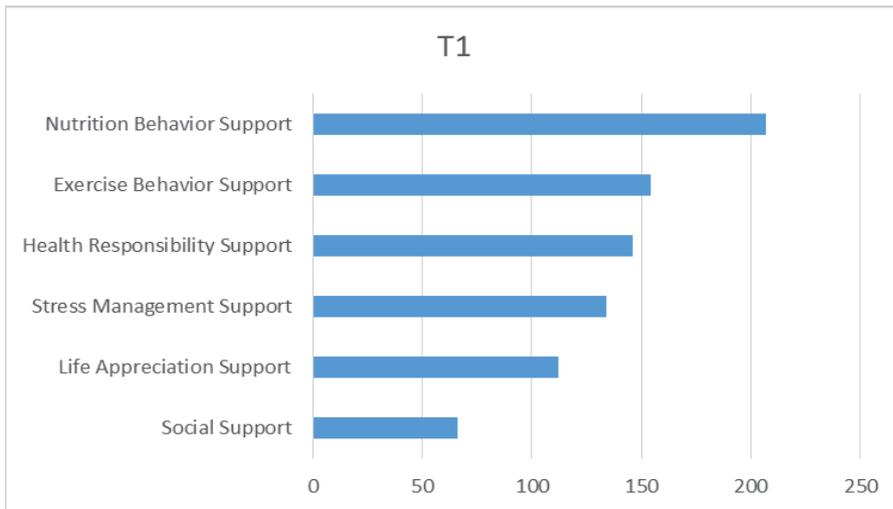


Figure 4.9. Ranking of support dimensions at T1 (total score for ranking)

T2 - Duration of Transportation to Work

This time slot can be renamed as morning transportation and ranked as 7th time slot between eight time slots. Most of the participants were driving car for transportation. “Stress Management Support” was ranked as 1st and “Life Appreciation Support” as 2nd. “Social Support” got the 3rd, “Health Responsibility Support” 4th, “Nutrition Behavior Support” 5th and “Exercise Behavior Support” on 6th place (Figure 4.10).

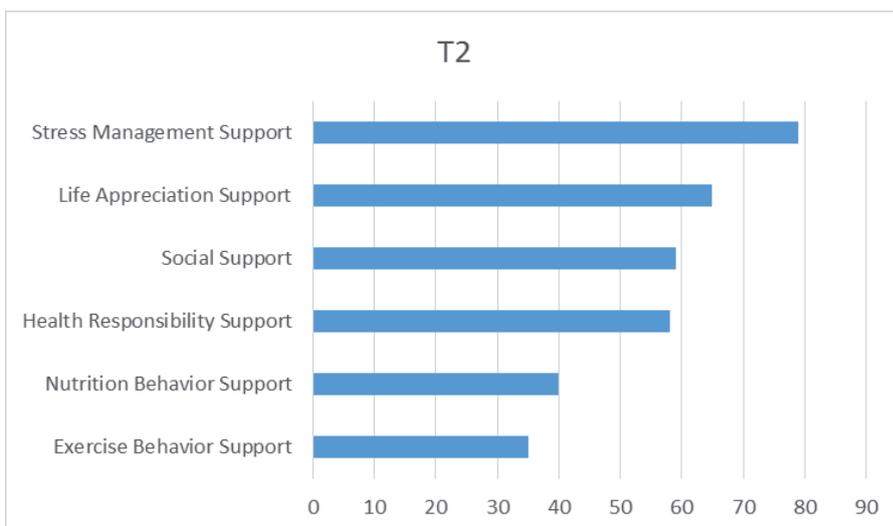


Figure 4.10. Ranking of support dimensions at T2 (total score for ranking)

The major need of participants from “Stress Management Support” was to overcome stress. Participants mainly had problem on coping with stress and they suggested a reduction of stress as a solution of stress problem. On designers’ perspective participants suggested different interactions with technology based health coach, such as, visual stimulus as a time and work plan, audio relaxing stimulus and custom music. Most of the participants wanted this interaction by a system that was connected with car and car’s audio system (Table 4.6).

T3 - Duration at Work

One of the longest time duration is the time spent at work. Participants placed duration at work (T3) on the 3rd place between time slots. In this time slots, “Stress Management Support” was ranked as the 1st, “Nutrition Behavior Support” as the 2nd and “Social Support” as 3rd. In addition, “Exercise Behavior Support” was ranked as the 4th, “Life Appreciation Support” as 5th and “Health Responsibility Support” as the last one (Figure 4.11).

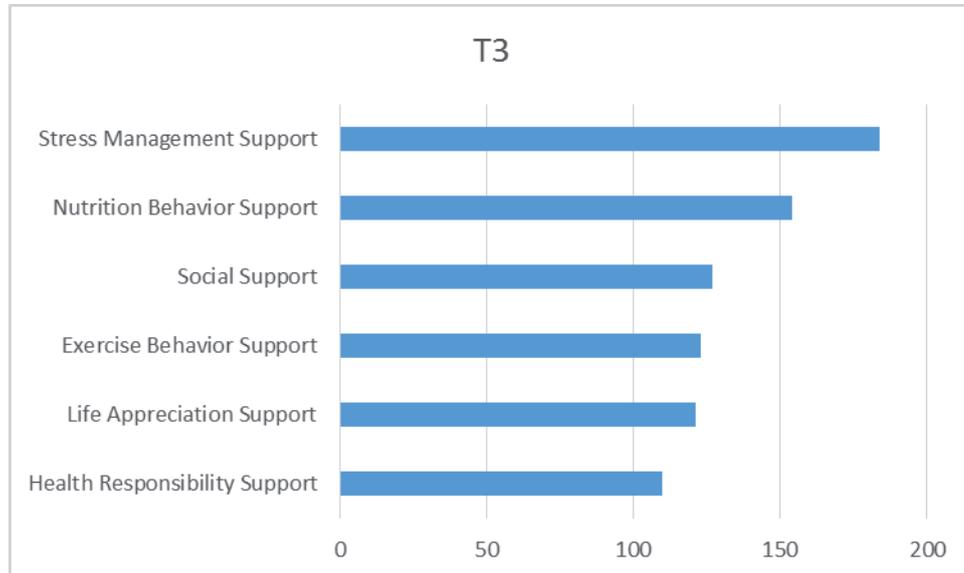


Figure 4.11. Ranking of support dimensions at T3 (total score for ranking)

Participants feel themselves mostly under stress at work. Their prior need was to overcome stress by support of “Stress Management Support”. The major problem of participants about this need was inability to cope with stress. For a solution, participants preferred to get a support for reduction of stress. Participants mostly suggested to get a relaxing audio stimulus from their computers and smartphone a possible design solution (Table 4.6).

T4 - Duration of Lunch Break

Duration of lunch break (T4) was ranked as 4th important time slot. In this time slot, “Nutrition Behavior Support” was placed as the 1st support of dimension. Afterwards, “Health Responsibility Support” got the 2nd place, “Exercise Behavior Support” got 3rd place, “Social Support” had the 4th place, “Stress Management Support” had the 5th place and “Life Appreciation Support” had the 6th place on the ranking of the support dimensions (Figure 4.12).

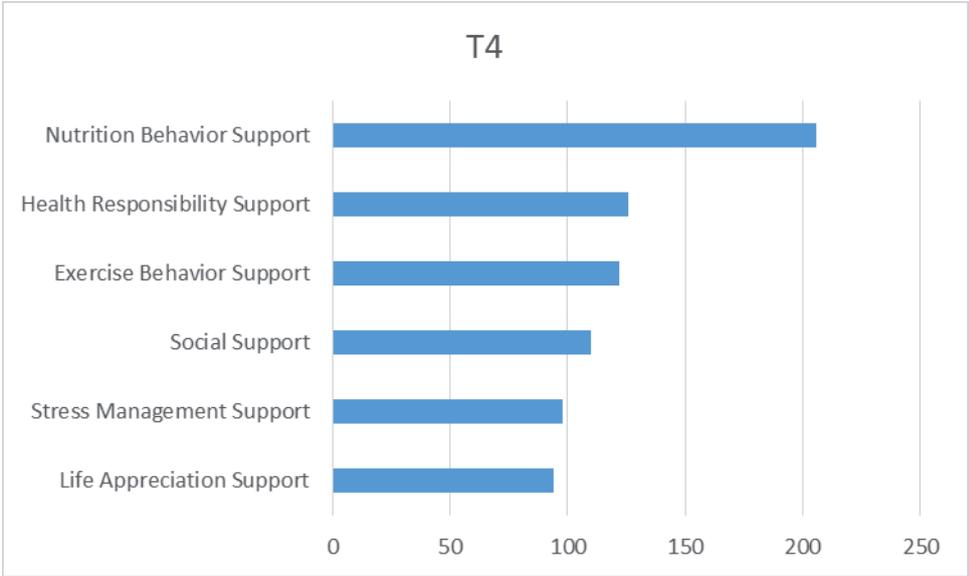


Figure 4.12. Ranking of support dimensions at T4 (total score for ranking)

The major need on “Nutrition Behavior Support” was desire to eat healthier. The main problem about need on this was lack of knowledge on nutrition behavior.

Participants preferred to take healthy nutrition tips to solve this problem. On designers' perspective, participants described that prescriptive personal nutrition information and tips would be great help to develop a knowledge on nutrition behavior. In addition, participants suggested to get this support via their smartphones at this time slot (Table 4.6).

T5 - Duration of Transportation to Home

Participants ranked duration of transportation to home (T5) as the 6th between time slots. During this time slot, "Social Support" was ranked as the 1st, "Stress Management Support" as the 2nd, "Life Appreciation Support" as the 3rd, "Nutrition Behavior Support" as the 4th, "Health Responsibility Support" as the 5th and "Exercise Behavior Support" for the 6th place (Figure 4.13).

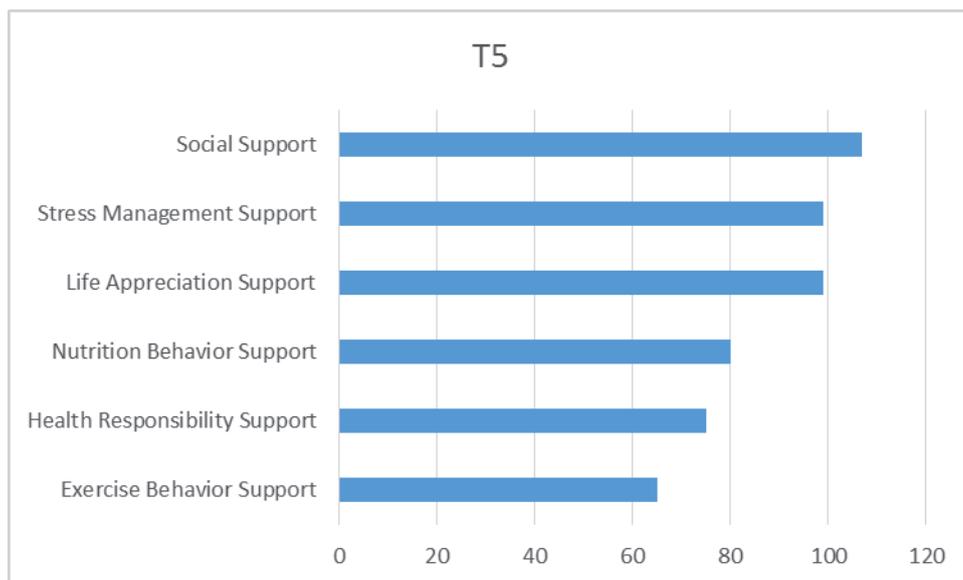


Figure 4.13. Ranking of support dimensions at T5 (total score for ranking)

Participants focused on getting "Social Support" for having social activities. Participants talked about just one problem about this need. The mentioned problem was inability to have to the point information about social activities and participants

suggested to get personal suggestions about social activities. Mostly preferred solutions were on an audio stimulus such as car system or smartphone (Table 4.6).

T6 - Duration at Home Before Going Bed

The duration at home before going bed was ranked as the 2nd most important time slot. Participants ranked support dimensions for this time slot as; “Nutrition Behavior Support” as the 1st, “Social Support” as the 2nd, “Exercise Behavior Support” as the 3rd, “Health Responsibility Support” as the 4th, “Life Appreciation Support” as the 5th and “Stress Management Support” as the 6th (Figure 4.14).

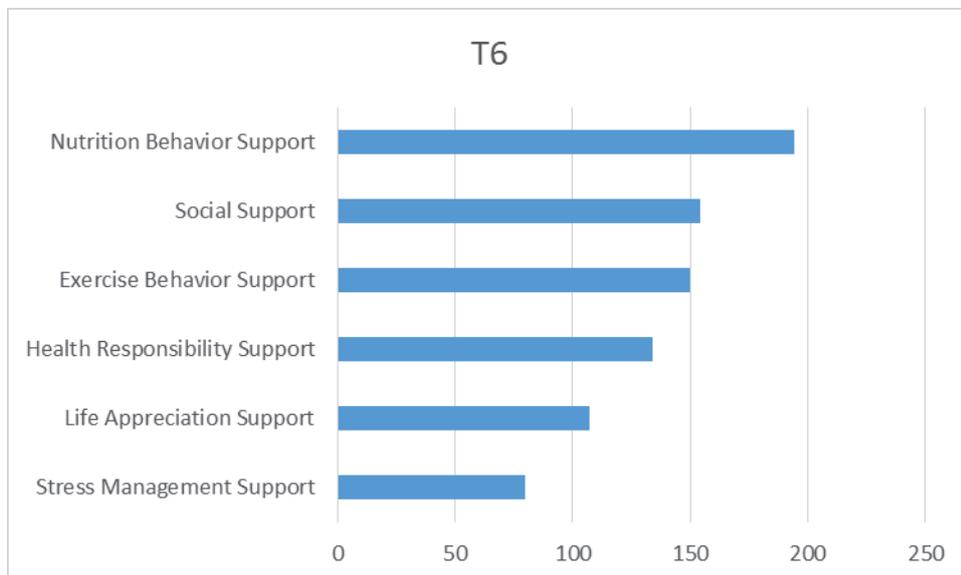


Figure 4.14. Ranking of support dimensions at T6 (total score for ranking)

Participants’ major need was on eating healthier at this time slot. The main problem that drives participants need this support was their inability to understand personal nutritional needs. Participants suggested that getting nutrition tips could be the main solution of problem. For a designer, participants preferred to get prescriptive personal nutrition information by smartphone on a visual interaction (Table 4.6).

T7 - Duration of Sleeping

Most of the participants did not want to be supported at this time slot. They explained this situation as desire not to be disturbed while sleeping. Four of the participants desire to be supported at this time slot by two different support types. One of them wanted to get a report of sleep quality and the other participants desire to be supported by an audio stimulus for relaxation in order to improve their sleep quality (Table 4.6).

T8 - Duration of Non-routine Days

According to the participants duration of non-routine days (T8) was the most important time slot for getting supported by a technology based health coaching. Participants ranked support dimensions as; “Exercise Behavior Support” was the 1st, “Social Support” was the 2nd, “Nutrition Behavior Support” was 3rd, “Health Responsibility Support” was the 4th, “Life Appreciation Support” was the 5th and “Stress Management Support” was the 6th (Figure 4.15).

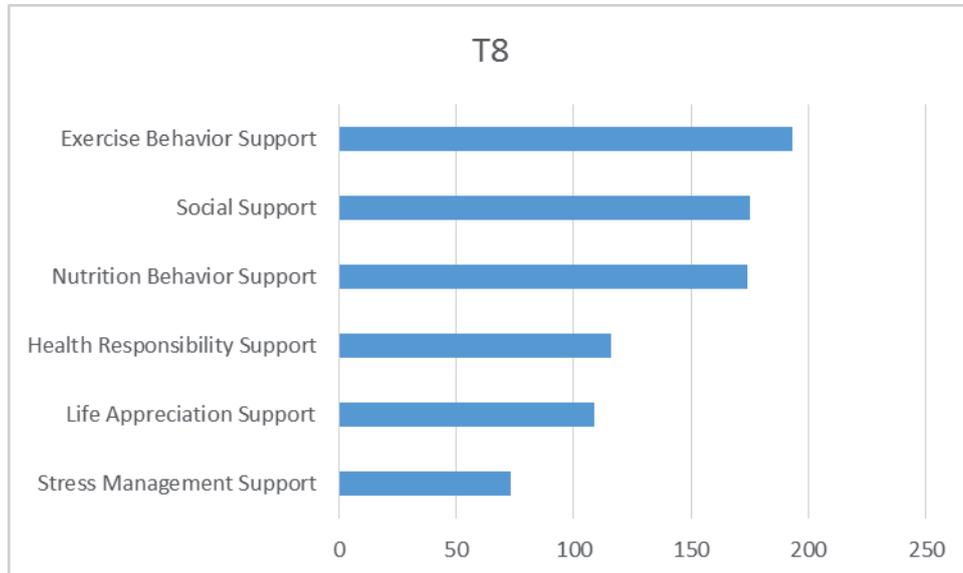


Figure 4.15. Ranking of support dimensions at T8 (total score for ranking)

On non-routine days participants' major need was being physically active. There two main reasons behind this need. Lack of motivation and lack of knowledge on nutrition behaviors were reasons and participants suggested social motivation, suggestions on physical activity for a solution of lack of motivation. On the other hand, participants preferred to get personal workouts, tips on physical activity and coaching on physical activity during this time slot. Mostly desired interaction was visual and audio stimulus but these stimulus suggested to be intrusive (Table 4.6).

Table 4.6 Summary of results for daily time slots

	Major Support Dimension	Major Goal	Major Problem	Major Need	Interaction
T1 - Duration Between Waking Up and Leaving Home	Nutrition Behavior Support	desire to have healthier diet	inability to be conscious about nutrition behavior	personal suggestions, prescriptive meal plan	visual stimulus on smartphone
T2 - Duration of Transportation to Work	Stress Management Support	desire to overcome stress	inability to cope with stress	reduction of stress by a relaxing stimulus	time and work plan, audio relaxing stimulus and custom music
T3 - Duration at Work	Stress Management Support	desire to overcome stress	inability to cope with stress	relaxing stimulus	audio stimulus by computer
T4 - Duration at Lunch Break	Nutrition Behavior Support	desire to have healthier diet	inability to be conscious about nutrition behavior	tips on nutrition behavior	prescriptive personal nutrition information and tips
T5 - Duration of Transportation to Home	Social Support	desire to have social activities	inability to have to the point information about social activities	personal suggestions	audio stimulus by car or smartphone
T6 - Duration at Home Before Going Bed	Nutrition Behavior Support	desire to have healthier diet	inability to understand personal nutritional needs	getting nutritional tips	prescriptive personal nutrition information by smartphone on a visual interaction
T7 - Duration of Sleeping	Stress Management Support	desire to improve sleep quality	inability to manage sleep quality	relaxing stimulus	audio relaxation
T8 - Duration of Non-Routine Days	Exercise Behavior Support	desire to be physically active	inability to be conscious about exercise behavior	personal workouts, tips on exercise and coaching during exercise	intrusive audio and visual stimulus

4.2. Research Question 2: Do the college graduate employees’ technology based health coaching needs differ in terms of sex?

In this part, Mann-Whitney U test was conducted to understand whether there was a significant difference between man and women in terms of their perceived needs on technology based health coaching.

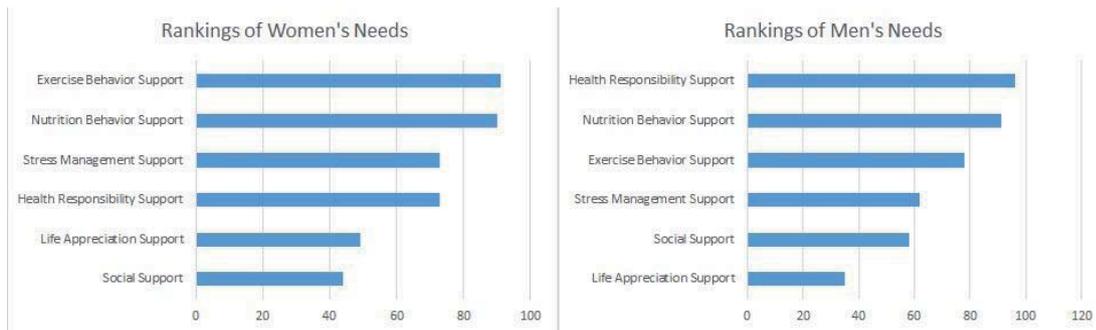


Figure 4.16 Rankings of women’s and men’s needs

Nutrition Behavior Support

The results of Mann-Whitney U test showed that women ($M = 20.93$) did not significantly differ from men ($M = 20.08$) on technology based health coaching needs about “Nutrition Behavior Support”, $W = 191.50$, $z = -3.71$, $p > .05$.

Table 4.7. Results of Mann-Whitney U test for needs of women and men

Mann-Whitney U Test							
	Sex	N	Mean Rank	Sum of Ranks	U	Z	p
Nutrition Behavior Support	Women	20	20.93	418.50	191.50	-.24	.81
	Men	20	20.08	401.50			

$p < .05$

Health Responsibility Support

According to Mann-Whitney U test results, women ($M = 25.18$) significantly differs from men ($M = 15.83$) on technology based health coaching needs about *Health Responsibility Support*, $W = 106.50$, $z = -2.60$, $p < .05$, $r = .41$. Men's needs of Health Responsibility Support was significantly more important than women's needs (Figure 4.16).

Table 4.8. Results of Mann-Whitney U Test for Health Responsibility Support

Mann-Whitney U Test							
	Sex	N	Mean Rank	Sum of Ranks	U	Z	p
Health Responsibility Support	Women	20	25.18	503.50	106.50	-2.60	.01*
	Men	20	15.83	316.50			

*Significant difference ($p < .05$)

Exercise Behavior Support

The results showed that that women ($M = 17.50$) did not significantly differ from men ($M = 23.50$) on technology based health coaching needs about "Exercise Behavior Support", $W = 140.00$, $z = -1.66$, $p > .05$.

Table 4.9. Results of Mann-Whitney U test for Exercise Behavior Support

Mann-Whitney U Test							
	Sex	N	Mean Rank	Sum of Ranks	U	Z	p
Exercise Behavior Support	Women	20	17.50	350.00	140.00	-1.66	.10
	Men	20	23.50	470.00			

$p < .05$

Stress Management Support

The results of Mann-Whitney U test showed that women ($M = 18.75$) did not significantly differ from men ($M = 22.25$) on technology based health coaching needs about “Stress Management Support”, $W = 165.00$, $z = -.97$, $p > .05$.

Table 4.10. Results of Mann-Whitney U test for Stress Management Support

Mann-Whitney U Test							
	Sex	N	Mean Rank	Sum of Ranks	U	Z	p
Stress Management Support	Women	20	18.75	375.00	165.00	-.97	.34
	Men	20	22.25	445.00			

$p < .05$

Social Support

The results of Mann-Whitney U test showed that women ($M = 23.45$) did not significantly differ from men ($M = 17.55$) on technology based health coaching needs about “Social Support”, $W = 141.00$, $z = -1.67$, $p > .05$.

Table 4.11. Results of Mann-Whitney U test for Social Support

Mann-Whitney U Test							
	Sex	N	Mean Rank	Sum of Ranks	U	Z	p
Social Support	Female	20	23.45	469.00	141.00	-1.67	.10
	Male	20	17.55	351.00			

$p < .05$

Life Appreciation Support

The results of Mann-Whitney U test showed that women ($M = 17.75$) did not significantly differ from men ($M = 23.25$) on technology based health coaching needs about “Life Appreciation Support”, $W = 145.00$, $z = -1.58$, $p > .05$.

Table 4.12. Results of Mann-Whitney U test for Life Appreciation Support

Mann-Whitney U Test							
	Sex	N	Mean Rank	Sum of Ranks	U	Z	p
Life Appreciation Support	Female	20	17.75	355.00	145.00	-1.58	.12
	Male	20	23.25	465.00			

$p < .05$

4.3. Research Question 3: Do the college graduate employees’ technology based health coaching needs differ in terms of exercise stages?

A Kruskal-Wallis test was conducted to understand differences among the four exercise stages of change (Stage 2, Stage 3, Stage 4, and Stage 5) on technology based health coaching needs of college graduate employees. The results of test were significant for “Stress Management Support”. $H(3) = 7.82$, $p < .05$. In addition, the pairwise multiple comparisons show that Stage 3 significantly differs $p < .05$ from Stage 2 (contemplation) data. Stage 3 participants’ needs on “Stress Management Support” were significantly more important than Stage 2 (contemplation) participants’ needs on “Stress Management Support”.

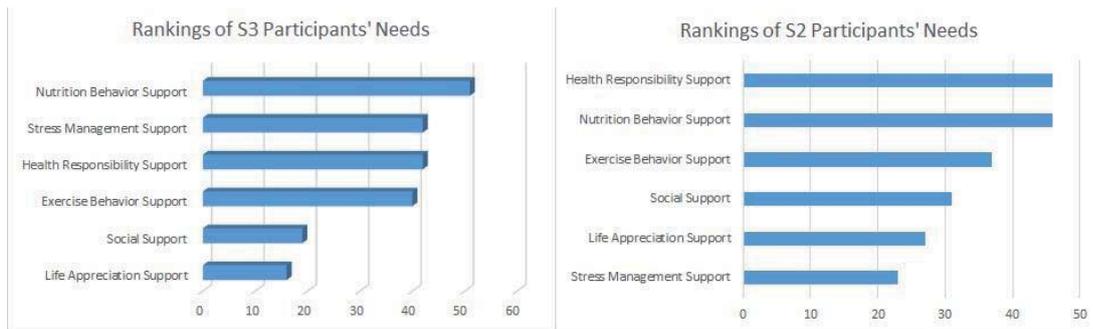


Figure 4.17 Rankings of S2 and S3 participants' needs

4.4. Research Question 4: Do the college graduate employees' technology based health coaching needs differ in terms of daily time slots?

In order to understand differences between eight time slots (T1, T2, T3, T4, T5, T6, T7, T8) a Kruskal-Wallis test was conducted on technology based health coaching needs of college graduate employees. The results showed that participants' perceived needs were significantly differed for all support dimensions between time slots.

Nutrition Behavior Support,

The results were significant $H(7) = 80.39, p < .05$. In T1, T4 and T6, "Nutrition Behavior Support" had the 1st place. Pairwise Comparisons showed that time slots T4 and T8, T4 and T3, T4 and T5, T4 and T2, T1 and T3, T1 and T5, T1 and T2, T6 and T5, T6 and T2, T8 and T2 were significantly differed from each other $p < .05$.

Exercise Behavior Support

The results were significant $H(7) = 40.78, p < .05$. In addition, pairwise comparisons showed that time slots T8 and T4, T8 and T3, T8 and T5, T8 and T2, T1 and T2, T6 and T2 were significantly differed from each other $p < .05$.

Health Responsibility Support

The results were significant $H(7) = 18.05, p < .05$. In addition, pairwise comparisons showed that time slots were not significantly differed from each other $p < .05$.

Life Appreciation Support

The results were significant $H(7) = 20.77, p < .05$. In addition, pairwise comparison results showed that time slots T5 and T4 were significantly differ from each other, $p < .05$.

Social Support

The results were significant $H(7) = 68.05$ and $p < .05$. In addition, pairwise comparisons showed that time slots T5 and T1, T8 and T4, T8 and T1, T6 and T1, T2 and T1, T3 and T1, T4 and T1 were significantly differ from each other, $p < .05$.

Stress Management Support

The results were significant $H(7, 238) = 89.16, p < .05$. In addition, pairwise comparisons showed that time slots T7 and T6, T7 and T8, T2 and T4, T2 and T6, T2 and T8, T3 and T4, T3 and T6, T3 and T8, T5 and T6, T5 and T8, T1 and T6, T1 and T8 were significantly differ from each other, $p < .05$

CHAPTER 5

DISCUSSION

This study was conducted to understand college graduate employees' technology based health coaching needs. In order to identify these needs, qualitative and quantitative analysis were performed. In this chapter, the findings of the study for each research question will be discussed in detail.

5.1. Research Question 1: What are the college graduate employees' technology based health coaching needs in terms of sex, exercise stages of change and daily time slots?

Sex

Findings on technology based health coaching needs in terms of sex indicated that perceived needs for exercise behavior support was highest ranked by women, and "Health Responsibility Behavior" support was highest ranked by men. "Nutrition Behavior Support" is the second most important dimension for both women and men. On the other hand, women ranked the perceived need for social behavior support lowest, and men ranked the life appreciation behavior support lowest.

The stated reasons beyond women's ranking order of health promoting behavior support dimensions were perceived need for body weight management, lack of knowledge in the related health promoting behavior, and poor motivation for exercise. Men's stated reasons were similar to women's except body weight management. In earlier studies, Davis and Cowles (1991) stated that women motivated by aesthetical concerns rather than health related issues in wellness. James (2003) also found that men were significantly satisfied with their current weight than the women even they (men) were overweight. Current study findings on the reasons beyond ranking order is in line with these studies (Davis & Cowles, 1991; James, 2003).

Participants' expectations from technology based health coach were providing visual messages, instant coaching during the workouts/daily activities, and workout/nutritional prescriptions. Women emphasized more on visual messages and workout/nutritional prescriptions. Men focused more on instant coaching during the workouts/daily activities. Both women and men explained their solution on health responsibility as having medical check-up and tracking of vital signs. However, women preferred to get this kind of support only at home by stressing on personal privacy.

Considering the above mentioned findings, it can be said that technology based health coaching systems should stress on exercise and nutrition behavior for women. These information should be provided by visual messages and workout/daily activity prescriptions for them. Personal privacy is important for women and information should be provided when they are at home. Technology based health coaching systems for men should stress on health responsibility, nutrition and exercise dimensions. These information should mainly be provided when they use that information (e.g. during exercise, during lunch or dinner).

Previous studies about health promoting behaviors by sex indicated higher health responsibility in women as compared to the men (Verbrugge, 1985b; Waldron, 1998). Studies also indicated that men have higher exercise participation than the women (Azevedo et al., 2007; Lee, 2005). Even though, above mentioned studies are not specifically on college graduated men and women, current study findings on college graduate employees represent a similar pattern. Considering the perceived need, college graduate men employees emphasize more on health responsibility, and women stress on exercise.

There is limited information on the health promoting behaviors of college graduate employees, and technology based health coaching designs specifically for this group in the literature. Current study findings provide first evidence specifically on the perceived health promoting behaviors and expectations from the technology based health coaching designs for this population by sex differences in Turkish setting.

Exercise Stages of Change

According to the findings on exercise stages of changes, perceived need for “Health Responsibility Support” and “Nutrition Behavior Support” support for the contemplation group (stage 2), “Nutrition Behavior Support” for the preparation group (stage 3), “Exercise Behavior Support” and “Health Responsibility Support” for the action group (stage 4) and “Nutrition Behavior Support” and “Exercise Behavior Support” behavior for the maintenance group (stage 5) were the highest ranked dimensions. On the other hand, perceived need for “Life Appreciation Support” and “Social Support” dimensions were ranked lowest by all exercise stages.

On expectations from technology based health coaching systems, participants explained that a mobile preventive medical support is a good solution as a “Health Responsibility Support”. However, this solution was suggested at higher stages of exercise level (Stage 4 and Stage 5). According to literature, exercise and health status have a positive correlation, so that, individuals at Stage 4 (action) and Stage 5 (maintenance) have better health status than lower stages (Ince & Ebem, 2009).

On “Health Responsibility Support”, the results showed that in all stages participants desire to prevent and promote their health status. In addition, they desire to change health responsibility behaviors. However, only at Stage 4 (action) and Stage 5 (maintenance), participants did not have any desire to change health responsibility behaviors. This can be result of association between level of exercise and health promoting behaviors (Blair et al., 1985). Participants of these stages have higher participation in exercise and perform better health promotion behaviors than lowers stages (Cardinal, 1995; Laforge et al., 1999; McAuley & Courneya, 1993).

College graduate employees’ perceived needs mainly did not differ, they are clustered around desire to change nutrition behavior and promote health status. However, at Stage 2 (contemplation) and Stage 5 (maintenance), participants desire to be conscious about nutrition behavior. Although, during the interviews Stage 2 (contemplation) participants explained that they need to get knowledge on the basics

of nutrition. On the other hand, Stage 5 (maintenance) participants preferred to have tips and prescriptive knowledge for improving their physical performance. However, the findings did not have any association with literature, the literature showed that there is no significant association between physical activity and knowledge about nutrition (Gürel, Gemalmaz, & Dişçigil).

The results showed that Stage 2 (contemplation) and Stage 3 participants need to be supported for participating exercise by motivational stimulus. However, Stage 4 (action) and Stage 5 (maintenance) participants did not need support about motivation, they mostly focused on gaining knowledge about exercise. The differentiation in motivational needs can be explained by transtheoretical models' motivational readiness. In the lower stages, a more powerful motivation is needed for changing exercise behaviors, on the other hand, in the higher stages instead of behavior change maintenance is fixated (Fallon, Hausenblas, & Nigg, 2005; Laforge et al., 1999; Woods, Mutrie, & Scott, 2002).

Considering the above mentioned findings, it can be said that technology based health coaching systems should provide specifically tailored support for each exercise stages of change. Current study provides the first evidence about the college graduate employees expectations from technology based health coaching systems in terms of exercise stages of change.

Daily Time Slots

Findings on time slots indicated that T8 (duration of non-routine days), T6 (duration at home before going bed) and T3 (duration at work) were the most critical time slots for being supported by technology based health coaching. Participants were expecting support for exercise, social and nutrition behaviors at T8, nutrition for T6, and stress management for T3.

At T8, individuals are on their non-routine day and mostly this time slot means as weekend or holiday. In these type of days, a significant change in nutrition and exercise behaviors are observed (Davison, Tsujimoto, & Glaros, 1973; Heimendinger

& Van Duyn, 1995). Participants majorly preferred to be supported by “Exercise Behavior Support”, “Social Support” and “Nutrition Behavior Support” at T8, in order to control the significant change in their behaviors. In interviews, participants explained their need on “Nutrition Behavior Support” as, regulating the shifts in meal times and limiting the amount of food. These needs can be explained by significant changes in dietary behaviors at weekend.

At T6, individuals are just arrived home and spend their time on themselves. This time slot is covering dinner. On contrast to breakfast and lunch, individuals pay more attention for dinner and have a chance to spend more time for preparation and eating. In the interviews, participants explained about “Nutrition Behavior Support” that they have better chance to prepare a home-made meal and they can prepare the meal according to their nutritional needs.

Finally, since T3 is the time duration spend at work, the level of stress increases hopefully. Recent studies showed that, different causes of work-related stress were listed; long hours, heavy workload, tight deadlines, lack of autonomy, inadequate working environment (Ganster & Schaubroeck, 1991; Payne, 1999). According to interviews, time and work plan is one of the major solutions for work-related stress. Individuals need assistance for their workplace and daily duties and planning is a good way to cope with stress. Literature showed that developing a plan is an effective tackle for work related stress.

Considering the above mentioned findings, it can be said that technology based health coaching should provide appropriate health promoting behavior support according to the perceived needs of college graduate employees for each daily time slot. Current study provides the first evidence about the college graduate employees expectations from technology based health coaching in terms of daily time slots.

5.2. Research Question 2: Do the college graduate employees’ technology based health coaching needs differ in terms of sex?

The findings showed that college graduate employees' technology based health coaching needs significantly differ only in Health Responsibility Support in terms of sex. Perceived health responsibility need was higher in men college graduate employees' than the women employees related needs.

Previous studies showed that women perform better health responsibility behaviors than men (Verbrugge, 1985a). For example, women visit physicians more frequent than men do, women smoke less than man and place more importance on their physical wellbeing than men do (Macintyre et al., 1996; Verbrugge, 1985a; Waldron, 1998). According to interviews, college graduate men were aware about lack of performing health responsibilities and by "Health Responsibility Support", they want to promote and prevent their health status. Future technology based health coaching designs should give priority to the health responsibility support for men.

5.3. Research Question 3: Do the college graduate employees' technology based health coaching needs differ in terms of exercise stages?

The findings showed that college graduate employees' technology based health coaching needs significantly differ between Stage 2 and Stage 3 only for Stress Management Support.

In the interviews, managing body weight was the major cause of stress for participants at Stage 3 (preparation). They explain the relation between nutrition, exercise and stress as two way reaction. As their stress increases, health behaviors about nutrition and exercise decreases. Similarly, as level of health behaviors about nutrition and exercise increases, level of stress decreases. At Stage 3 (preparation), participants just began to exercise on a regular basis but this change in their daily life and importance of this step push them to have supported by "Stress Management Support".

Based on the findings, future technology based health coaching designs should give priority to the stress management support for stage 3 college graduated employees.

5.4. Research Question 4: Do the college graduate employees' technology based health coaching needs differ in terms of daily time slots?

According to results, technology based health coaching needs of college graduate employees significantly differ by daily time slots in all support dimensions. Since, activities of daily living changes sharply in different times of day, the needs and the problems of college graduate employees differ by daily time slots (Foti & Kanazawa, 2006; Spector et al., 1987; Wiener et al., 1990). In the interviews, participants place more importance for "Nutrition Behavior Support" on meal times as a physiological need, "Stress Management Support" at work because of coping with work related stress, "Exercise Behavior Support" and "Social Support" on non-routine days.

Major reason is the effect of activities of daily living on health promoting behaviors. Non-routine days provides individuals a great leisure time for having different activities. For example, participants declared that on non-routine days they eat more than the amount they eat in weekdays. In order to limit the amount they preferred to have supported by "Nutrition Behavior Support". As a leisure time activity, individuals preferred to have social activities on the non-routine days or the time duration after work on weekdays.

As discussed above, participants needs differ by daily time slots. Based on the findings, future technology based health coaching designs should emphasize on the perceived needs of college graduate employees for each specific daily time slots.

Chapter 6

CONCLUSION AND RECOMMENDATIONS

6.1 Conclusions

According to the findings of the study, college graduate employees technology based health coaching needs differ by sex, exercise stages of change and daily time slots. The results showed that college graduate employees place more importance on physical health, since Nutrition Behavior Support, Health Responsibility Support and Exercise Behavior Support have ranked generally in the 1st, 2nd and 3rd place.

With the findings, technology based health coaching can be designed on six health promotion behaviors. However, this design should be based on the top three important support dimensions; “Health Responsibility Support”, “Exercise Behavior Support” and “Nutrition Behavior Support”. In addition, the results showed that, people desire technology based health coaching to **prevent** or **change** an undesired behavior, situation or habit; **manage** a situation that is encountered or **promote** a desirable behavior or situation.

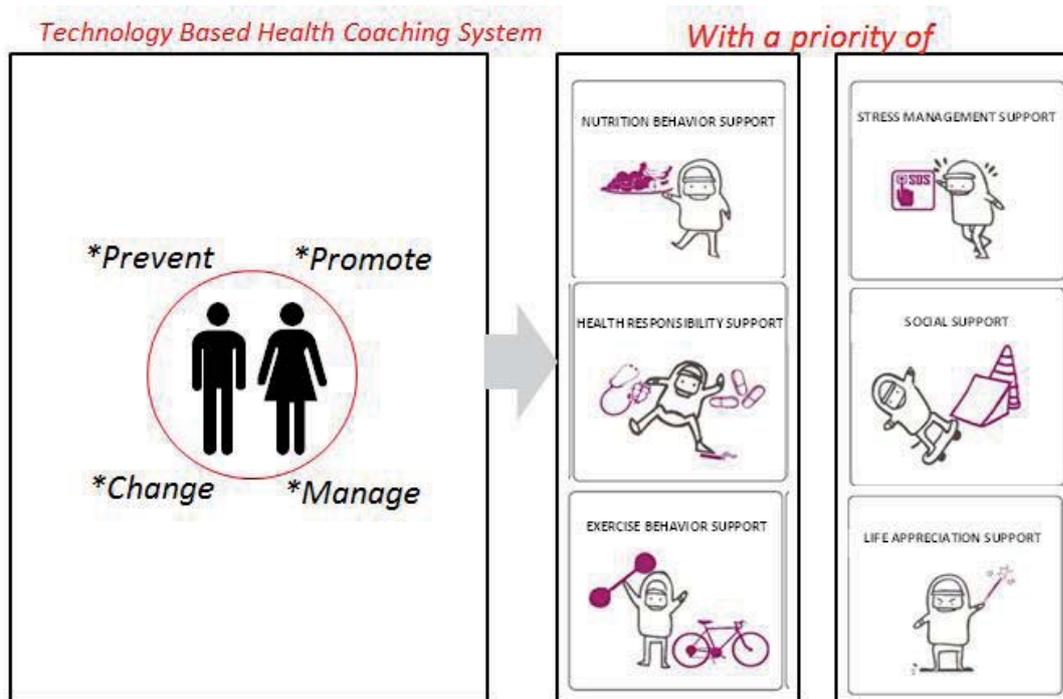


Figure 6.1. Summary of findings

The problems and design solutions differ generally. Women permanent and specific solutions about a situation or habits, however, men prefer instant and temporary solutions that affect their habits in a short period especially on health responsibilities. According to findings, technology based health coaching should support like an intelligent personalized system that can create awareness and make people have healthier choices or get practical solutions, such a making suggestions about a healthy meal serving restaurant instead of a fast food brand. Possible design solutions should be intrusive to motivate both men and women.

6.2 Recommendations for Designers

According to findings, following recommendations were drawn for the designers:

1. Sex, exercise stages of change and daily time slots should be considered while designing technology based health coaching systems.
2. According to results of the study, people place priority on physical health. In order to build health promotion system with a holistic perspective, basis of

the system should be constructed on physical health and other dimensions of health should be placed under physical wellbeing.

3. The support from technology based health coaching differs in needs, problems and interaction in terms of sex. Designers should consider sex based differences of this study on designing technology based health coaching. In addition, women's privacy should also be considered in design.
4. Designers should also focus on exercise stages of change on designing systems. Health promoting approach differs from promoting to preventing by stepping up from lower stages to higher stages.
5. College graduate employees generally need to be supported on long time durations such as non-routine days, working hours and when they are at home. These time slots should be focused on design with a priority.

6.3 Recommendations for Further Studies

1. According to the findings of the study, intervention of technology based health coaching should be studied on college graduate employees.
2. Stage 1 (pre-contemplation) should be studied in detail. The needs of Stage 1 participants may differ intensely.
3. Sample size was small. Re-application of the study with a wider sample should also be considered.
4. Individuals other than college graduate employees can be studied.
5. A study with a similar approach on college graduate employees can be applied specific for their workplace environment. A work-place technology-based health promotion system can be studied on related study.
6. The effect of sex in each stage of exercise stages of change should be studied with a wider sample.
7. Older age groups should also be studied.

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APPENDICES

APPENDIX A

Middle East Technical University Human Ethics Committee Granted Ethical Approval

UYGULAMALI ETİK ARAŞTIRMA MERKEZİ
APPLIED ETHICS RESEARCH CENTER

ORTA DOĞU TEKNİK ÜNİVERSİTESİ
MIDDLE EAST TECHNICAL UNIVERSITY

DUMLUPINAR BULVARI 06800
ÇANKAYA ANKARA/TURKEY
T: +90 312 210 22 91
F: +90 312 210 79 59
ueam@metu.edu.tr
www.ueam.metu.edu.tr

Sayı: 28620816/216 -393

25.04.2014

Gönderilen : Doç. Dr Mustafa Levent INCE
Beden Eğitimi ve Spor Bölümü

Gönderen : Prof. Dr. Canan Özgen *Canan Özgen*
IAK Başkanı

İlgi : Etik Onayı

Danışmanlığını yapmış olduğunuz Beden Eğitimi ve Spor Bölümü öğrencisi Hakan Kuru'nun "Examination of the Perceived Virtual Health Coach Needs of College Graduated Employees By Gender, Exercise Stages Of Change And Daily Time Slots" isimli araştırması "İnsan Araştırmaları Komitesi" tarafından uygun görülerek gerekli onay verilmiştir.

Bilgilerinize saygılarımla sunarım.

Etik Komite Onayı
Uygundur
25/04/2014

Canan Özgen
Prof. Dr. Canan Özgen
Uygulamalı Etik Araştırma Merkezi
(UEAM) Başkanı
ODTÜ 06531 ANKARA

APPENDIX B

KATILIMCI ANKETİ

Değerli Katılımcı,

Bu çalışma, Orta Doğu Teknik Üniversitesi, Beden Eğitimi ve Spor Bölümü'nde yapmakta olduğu yüksek lisans kapsamında aldığım bir ders için yapılmaktadır. Verdiğiniz cevaplar, ben, danışmanım ve dersin öğretim elemanı dışında 3. Şahıslarla kesinlikle paylaşılmayacaktır. Çalışmaya katıldığınız için teşekkür ederim.

Yüksek Lisans Öğrencisi Hakan KURU

1. KİŞİSEL BİLGİLER

Cinsiyetiniz : Erkek Kadın

Yaşınız :

2. PERSONA KARTLARI VE MÜLAKAT

Şimdi size 6 tane sanal sağlık koçu kartları veriyorum ve bunları **1'den 6'ya kadar sıralamanızı** istiyorum.

Sıralamanın **nedenlerini** öğrenmek istiyorum?

Beslenme Davranışı Desteği

Sağlık Sorumluluğu Desteği

Hayatı Takdir Desteği

Sosyal Destek

Egzersiz Davranışı Desteği

Stress Yönetimi Desteği

3.KATILIMCIYLA ZAMAN ARALIKLARI ILE ILGILI PERSONA KART SIRALAMALARI VE MÜLAKAT

Sizinle gün içinde yaptığımız **aktiviteleri ve zaman** aralığını temel alarak “Sanal Sağlık Koçu” ndan bu zamanlar içindeki beklentileriniz hakkında konuşmak istiyorum.

Zaman Aralığı	Sanal Yaşam Koçunun...	Önem	1	2	3	4	5	6	7
Uyanmak ve evden çıkıncaya kadar geçen zaman	Sabah uyandığınız andan evden ayrılıncaya kadar geçen sürede nasıl bir destek beklerdiniz?	Bu süre içinde bahsettiğiniz destekleri almak sizin için ne kadar önemlidir? Sizinle nasıl bağlantı/iletişim/etkileşim kurmasını isterdiniz?	1	2	3	4	5	6	7
Evden işe ulaşıncaya kadar geçen zaman	Evinizden işinize gidinceye kadar geçen sürede nasıl bir destek beklerdiniz?		1	2	3	4	5	6	7
İş yerinizde geçirdiğiniz zaman	İş yerinizde öğle arasına kadar geçirdiğiniz zamanda nasıl bir destek beklerdiniz?		1	2	3	4	5	6	7
Öğle arasında geçirilen zaman	Öğle aranızda geçen zamanda nasıl bir destek beklerdiniz?		1	2	3	4	5	6	7
İşten çıkıp eve ulaşıncaya kadar geçen zaman	İşinizden evinize giderken geçen zamanda size nasıl destek vermesini istersiniz?		1	2	3	4	5	6	7
Evde yatıncaya kadar geçen zaman	Akşam evinizde yatıncaya kadar geçen zamanda size nasıl destek vermesini istersiniz?		1	2	3	4	5	6	7
Uyurken geçen zaman	Uyurken size nasıl bir destek vermesini isterdiniz?		1	2	3	4	5	6	7
Tatil günlerinde ya da rutininiz değiştiğinde	Tatil günleri gibi rutininiz değiştiği zamanlarda size nasıl bir destek vermesini isterdiniz?		1	2	3	4	5	6	7

4.FİZİKSEL AKTİVİTE KATILIM DURUMU

Bu bölümdeki sorular genel olarak sizin orta düzeyde fiziksel aktiviteye katılım durumunuzla ilgilidir.

Orta düzeyde fiziksel aktiviteler nefes alımında ve kalp atımında biraz artış gözlenen aktivitelerdir. Ritimli yürüyüş, dans, bahçe işleri, düşük şiddette yüzme veya arazide bisiklet sürme gibi etkinlikler orta düzeyde aktivite olarak değerlendirilir.

Orta düzeyde fiziksel aktivitenin **düzenli sayılabilmesi** için, aktivitenin haftada 5 veya daha fazla günde 30 dakika veya daha fazla olması gerekir. Örneğin, 30 dakika süreyle yürüyüş yapabilir veya 10 dakikalık 3 farklı aktivite ile 30 dakikayı doldurabilirsiniz.

<i>Lütfen her soru için Evet veya Hayır seçeneğini işaretleyiniz.</i>		Evet	Hayır
Şu anda <u>orta düzeyde</u> fiziksel aktiviteye katılmaktayım.		<input type="radio"/>	<input type="radio"/>
Gelecek 6 ayda orta düzeyde fiziksel aktiviteye katılımımı arttırmak niyetindeyim.		<input type="radio"/>	<input type="radio"/>
Şu anda <u>düzenli</u> olarak orta düzeyde fiziksel aktivite yapmaktayım.		<input type="radio"/>	<input type="radio"/>
Son <u>4.6</u> aydır düzenli olarak orta düzeyde fiziksel aktiviteye katılmaktayım.		<input type="radio"/>	<input type="radio"/>

KATILDIĞINIZ İÇİN ÇOK TEŞEKKÜRLER

APPENDIX C

TÜRKÇE ÖZET

Dünya Sağlık Örgütü sağlığı, sadece hastalığın yokluğu olarak değil, fiziksel, ruhsal ve sosyal olarak tam bir iyi oluş durumu olarak tanımlamıştır. Yaşam kalitesi ise kişinin fiziksel sağlığı, psikolojik durumu, bağımsızlık seviyesi, sosyal ilişkileri ve çevresindekilerle ilişkilerden etkilenen oldukça geniş bir kavram olarak tanımlamıştır. Yaşam kalitesinin ‘normal’ günlük yaşama katkıda bulunan çok sayıda fiziksel, ruhsal ve sosyal faktörler arasındaki karmaşık etkileşimleri ve kişisel tepkileri ifade ettiği uzun zamandır bilinmektedir. Aile ilişkileri, kültür, yaş, sosyal sınıf, fiziksel görünüm ve cinsiyet gibi sosyal faktörlerin yaşam kalitesinin önemli belirleyicilerinden olduğunu belirtmiştir. Yaşam kalitesinin öznel iyi oluş ile ilişkisini belirlemeye yönelik yapılan çalışmalarda fiziksel çekicilik ve gelir düzeyi ile ilgili anlamlı ilişkiler bulunmuştur.

Teknoloji hayatımızın içine girmekle birlikte işlerimizi ya da gündelik görevlerimizi gerçekleştirmekte yardımcı olmakla kalmamış, ayrıca yaşam kalitemizi arttırmaya yönelik olumlu etkiler de sağlamıştır. Özellikle sağlıklı yaşantıyı amaç edinen bireylerin işlerini kolaylaştırmış, bireylerin belirli işleri yapabilmesi ve yapmak konusunda istek duyması konusunda yardımlarda da bulunmuştur.

Sağlıklı yaşam davranışları ele alındığında çok farklı boyutlarda davranışlar olduğu literatürde belirtilmiştir. Bu çalışma da ise altı farklı sağlıklı yaşam davranışı ele alınmıştır. Bu davranışlar; egzersiz davranışı, beslenme davranışı, sağlık sorumluluğu davranışı, stres yönetimi davranışı, sosyal davranış ve hayatı takdir davranışı olmuştur.

Teknolojinin hayatımızdaki öneminin ve etkinliğinin günden güne artması ile birlikte sağlıklı yaşam davranışlarımızın yönetilmesi ya da değiştirilmesi gibi konularda da etkili bir araç olarak kullanılabilceği de çalışmalar tarafından desteklenmiştir. Bu çalışma da ise insanların sağlıklı yaşam için teknolojiyi nasıl kullanabileceklerini anlamak amacıyla altı farklı teknolojik destek planlanmıştır. Bu destek başlıkları yukarıda belirtilen altı farklı sağlıklı yaşam davranışından yola çıkarak

hazırlanmıştır. Çalışmada, verilecek destekler, egzersiz davranışı desteği, beslenme davranışı desteği, sağlık sorumluluğu desteği, stres yönetimi desteği, sosyal davranış desteği ve hayatı takdir desteği olmak üzere tasarlanmıştır.

Bu çalışmanın amacı, üniversite mezunu çalışanların, teknoloji temelli sağlık koçu ihtiyaçlarının, cinsiyet (kadın ve erkek), egzersiz katılım basamağı (Eğilim, Hazırlık, Eylem ve Devamlılık) ve günlük farklı zaman dilimlerine [sabah uyanıp evden çıkıncaya kadar geçen zaman (T1), evden işe ulaşım zamanı (T2), iş yerinde geçen zaman (T3), öğle arası (T4), işten eve ulaşım zamanı (T5), akşam evde uyuyuncaya kadar geçen zaman (T6), uyku zamanı (T7) ve rutinin değiştiği zamanlar (T8)] göre incelemektir.

Bu çalışmada belirlenen boyutların çalışmanın bir parçası olmasının ardında yatanlar ve detayları şöyledir:

Üniversite mezunu çalışanlar genelde ofis ya da kübik adı verilen hareket alanının kısıtlı olduğu ve zihnen yapılan işlerin ön planda olduğu ortamlarda çalışmaktadırlar. Bu çalışan grubun genel gelir durumu diğer eğitim gruplarından daha yüksek olmakla birlikte kişisel sağlıklarına da verdikleri önem diğer gelir ve eğitim gruplarından daha yüksektir. Ayrıca teknoloji kullanımını daha kolay benimsemektedirler.

Kadın ve erkek arasındaki fiziksel aktivite katılımları incelendiğinde, erkeklerin kadınlara göre daha hareketli bir yaşantıda oldukları ve fiziksel aktiviteye katılımlarının kadınlara göre daha fazla olduğu anlaşılmaktadır. Bunlarla beraber kadınlar erkeklere göre daha fazla yaşadıkları literatürde açıklanmaktadır. Sağlıklı yaşam davranışları göz önünde bulundurulduğunda kadın ve erkek arasında büyük farklılıklar gözlenmektedir. Örneğin kadınların erkeklerden daha az sigara içtikleri, fakat sigara tüketimini bırakmak konusunda erkekler kadar başarılı olmadıkları bulunmuştur.

Günlük yaşam davranışları ise kişilerin yardım almadan kendi başlarına her gün yapmaları gereken davranışları kapsamaktadır. Bu davranışlar altı temel davranış

olarak isimlendirilmektedir; yemek giyinmek, yıkanmak, tuvaleti kullanmak, bir yerden bir yere gidebilmek ve kontrollü olmak.

Egzersiz deęişim basamaęı ise kişilerin fiziksel aktiviteye katılım durumlarına motivasyonel hazırlıklarını incelemektedir. Beş farklı basamak tanımlanmaktadır. Bu model genellikle kişilerdeki fiziksel aktivite katılımlarının nasıl deęiştiiğini açıklamak için kullanılır.

Yukarıda belirtilenler dâhilinde, bu çalışma aşıęıda belirtilen araştırma sorularını yanıtlamaktadır.

1. Üniversite mezunu çalışanların teknoloji tabanlı saęlık koçu ihtiyaçları cinsiyet açısından, egzersiz deęişim basamakları ve günlük zaman dilimlerine göre nedir?
2. Üniversite mezunu çalışanların teknoloji tabanlı saęlık koçu ihtiyaçları cinsiyet açısından farklı mıdır?
3. Üniversite mezunu çalışanların teknoloji tabanlı saęlık koçu ihtiyaçları egzersiz deęişim basamakları açısından farklı mıdır?
4. Üniversite mezunu çalışanların teknoloji tabanlı saęlık koçu ihtiyaçları günlük zaman dilimleri bakımından farklı mıdır?

Kişisel saęlık teknolojilerinin altında yatan felsefe, belirli bir saęlık boyutuna veya bir ya da iki boyutuna odaklanmaktadır. Öte yandan, saęlıklı yaşam ve bireyin kendi kapasitesini artırmak ve refahını yükseltmenin sadece hastalığın yokluğu deęil tam bir esenlik anlamına gelmedięi anlaşılmıştır. Bu konuda bütünsel bir bakış açısına ihtiyaç vardır. Örneğin, ikna edici bir teknoloji ürünü fiziksel aktivite için motive edebilir, ama herhangi bir olası kardiyovasküler saęlık sorununu ya da glikoz seviyesini incelememektedir. Bu noktada, beslenme koçu ve egzersiz koçunun ortak çalıştığı bir sistem, egzersiz öncesi yenmesi gerekenleri analiz etmesi gereklidir.

Çalışmanın en önemli kısıtlılığı, küçük bir örneği içeren ve sadece Ankara'da yaşayan insanları kapsamasıdır. Sonuç olarak, bulguların genelleştirilmesi için de sınırlamalar vardır. Değişim modelindeki birinci basamak (bu basamaktaki katılımcılar fiziksel aktiviteye katılmamakta ve gelecek altı ay içinde fiziksel aktivite katılmak düşünmemektedir) çalışma dışı bırakılmıştır. Diğer bir deyişle, bu grup kendi sağlık durumları için dikkat etmemektedir. Bir öneri olarak, bu grup teknolojisini uygulaması ile bu grubu motive etmek için nasıl bir farklı bir bakış açısı ile ele alınabileceği göz önünde bulundurulabilir. Ayrıca, meslek türü bu çalışmada dikkate alınmamıştır. İşyeri ortam veya stres yükü de katılımcıların sıralamaları etkileyebileceği de göz önünde bulundurulmamıştır.

Sağlıklı yaşam davranışları için; değiştirmek veya sağlık durumlarını korumak veya hastalık veya yaralanmayı önlemek için bir birey ya da bireylerin grup tarafından alınan eylem gibi çeşitli tanımları bulunmaktadır. Literatürde, sağlıklı yaşam davranışları fiziksel aktiviteye katılmak, egzersiz yapmak, içki, tütün ya da uyuşturucu kullanmak gibi gözlenebilir eylemler olarak kabul edilir. Bunlara ek olarak, ağız sağlığı davranışları, uyku düzeni ve sürüş daha az çalışma yapılan sağlıklı yaşam davranışları olarak kabul edilmektedir.

Tipik bir üniversite mezunu çalışanın işyerinde geçirdiği zaman, onların günün üçte biri hatta yarısını bulmaktadır. Bu sebeple, iş yerinde sağlıklarını etkileyecek uygulamalar yapmak olumlu sonuçlar doğurabilecektir. Sonuç olarak, işyeri değiştirme veya sağlık davranışlarını şekillendirmek için ideal bir toplumda en rahat yer iş yerleridir. Ayrıca, bu sağlık davranışlarının teşvikini, sağlığa verilen önemi ve iş yeri verimliliği artırır. Ekonomik açıdan irdelendiğinde, işyeri sağlığı geliştirme programlarının 6 ya 1 gibi yüksek yatırım döndürdüğü ifade edilmektedir.

Beslenme, sağlık, büyüme ve gelişme için hayati önem taşımaktadır. Sağlıksız beslenme koroner kalp hastalığı, kanser, inme ve tip 2 diyabet gibi sonuçlar doğurabilmektedir. Sağlıklı ve yeterli beslenme bedensel gereksinimleri içeren güvenli gıda tüketimi olarak tanımlanmıştır. Bedensel gereksinimlerine ek olarak, sağlıklı beslenme, sosyal, zihinsel ve fiziksel sağlığa doğrudan veya dolaylı bağlamda katkıda bulunur. Diğer taraftan, kötü ya da eksik beslenme fiziksel duruma uygun olmayan yetersiz beslenme metabolizma için çok fazla veya az olduğu

beslenme olarak tanımlanmaktadır. Yetersiz beslenme birden fazla nedeni olabilir; hijyen, yoksulluk, eğitimsizlik ve hastalıklardır. Beslenme davranışı için kilo kontrolü amacıyla beslenmeye özen gösterilmesi, tuz alımına özen gösterilmesi, yeterli su tüketimi, gıdaların besin değerlerine özen gösterilmesi gerekmektedir.

Sağlık sorumluluğu ise bireyin kendi sağlığı ile ilgili sorumlu olduğu davranışlar olarak tanımlanmaktadır. Bu sağlık davranışları arasında diş fırçalamak, alkol tüketimine dikkat etmek, düzenli doktor kontrolüne gitmek, vücut kompozisyonuna dikkat etmek, yeterli süre uyumak gibi davranışlar kabul edilmektedir.

Fiziksel aktivite; iskelet kaslarının metabolik çalışması ile üretilen, dinlenme durumunun dışında enerji harcama ile sonuçlanan bedensel hareketlerdir. Örnek olarak ev ve iş yerinde yapılan aktiviteler, alışveriş, merdiven inme çıkma, temizlik gibi dinlenme durumu dışında ve uyumak dışında yaptığımız tüm aktivitelerdir. Öte yandan, egzersiz ise planlı olarak, istemli şekilde, fiziksel uygunluğun bir ya da bu uygunluğun bir kaç unsurunu geliştirmeyi amaçlayan sürekli ve devamlı bedensel aktivitelerdir. Egzersizde belli bir amaç bulunur. Belirli bir tempoda yürüyüş yapmak, fitness, koşu, bisiklet gibi sporlar buna örnek sayılabilir. İki arasındaki farkı bir örnekle açıklamak istersek, işe gitmek için veya markette alışveriş yaparken yürüme fiziksel aktivite, ancak spor ayakkabılarla parkta veya yürüyüş yolunda belli tempoda yürüme ise egzersizdir.

Fiziksel aktivitenin daha etkili olmasındaki en önemli unsurlardan biri düzenli olmasıdır. Düzenli olarak yapılan fiziksel aktivitenin kabızlık, barsak hastalıklarının önlenmesine veya gecikmesine yardımcı olduğu çalışmalarla ortaya koyulmuştur. Ayrıca fiziksel aktivite felç riskini de azalttığı bir diğer bulgu olarak tespit edilmiştir. Düzenli egzersiz ve fiziksel aktivite sağlıklı bir şekilde zayıflamaya, vücudun şekle girmesine yardımcı olur. İsteyerek yapılan fiziksel aktivite zevklidir ve yaşama arzusunu geliştirir. Kişi kendini daha güçlü hisseder ve özgüveni artar. Her yaşta fiziksel olarak aktif olmak kemiklerin dayanıklılığını artırır. Kemik yoğunluğunu artırır. Osteoporoza karşı koruyucudur. Güneş ışığından da faydalanarak yapacağınız yürüyüşlerde D-vitaminin de desteğiyle kemikler daha güçlenir. Kolesterol problemi

yoksa dahi yapılan egzersiz HDL (iyi kolesterol) yükselmesine, LDL ve VLDL (kötü kolesterolün) düşmesine büyük katkı sağlayacaktır.

Grup veya takım halinde yapılan fiziksel aktivite sosyal bir paylaşımdır, eğlence ve arkadaşlığın sürdürüldüğü bir yere ait olma duygusunu sağlar. Psikolojik açıdan da fiziksel aktivite ve egzersizin birçok faydası olduğu kanıtlanmıştır. Egzersiz ve fiziksel aktivitenin farklı yaş gruplarında farklı olumlu etkileri bulunmaktadır. Örneğin, yaşlılarda günlük aktivitelerini desteksiz yapabilme yetisini geliştirir. Stres, kişileri zorlayan, kısıtlayan ve engelleyen olaylar ya da durumlar karşısında verilen tepkilerin tümüdür. Stres kavramı sadece insanın üzerinde hissettiği baskı ve gerginlikle sınırlı değildir. Stres bir süreç olarak ele alındığında, olayları değerlendirme şeklinden, düşüncelere, duygulara ve davranışlara kadar pek çok boyuttan oluşur. Stresle baş etmenin en etkili ve iyi yolu, kişinin kendisinde strese sebep olan şeyleri fark edip kontrol altına almasıdır.

Stres sebepleri incelendiğinde genelde kişinin dışında gelişen çevresel nedenlerle oluştuğunu düşünülür. Aslında stresi oluşturan, bu çevresel etkileri, bireyin nasıl algıladığıdır. Kişi karşılaştığı olayları ya da durumları pek çok faktör ışığında değerlendirir ve yaşadığı olaylara bir anlam yükler. Kişi yaptığı bu değerlendirmeler ve yorumlamalar sonucunda çevresindekiler sebebiyle stres yaşar ya da yaşamaz. Stres kaynakları kişiden kişiye değişiklik gösterse de, pek çok insan için geçerli olan alan çalışmaları sonucunda tespit edilmiş bilinen stres kaynakları da vardır. Stres sinyalleri ise pek çok insan için aynıdır. Stres altında olan bireyler sinyallerini duygusal, düşünsel, davranışlar ve fiziksel belirtiler olarak yansıtır.

Optimizm ve sağlıklı yaşam arasında pozitif bir bağlantı olduğu önceki yıllarda yapılan çalışmalarla ortaya konmuştur. Hayatı takdir etmenin mutluluk ya da yaşamın anlamın kavranması açısından birçok bağlantısı da bulunmaktadır. Başkaları için bir şeyler yapmak, pozitif düşünmek, sahip olunanlar ya da durumlar karşısında takdir edebilmek gibi davranışlar hayatı takdir davranışları olarak kabul edilmektedir.

Çalışmanın metodolojik kısmında ise ihtiyaç analizine uygun olarak, karma yöntem uygulanmıştır. Sayısal veriler anketlerle (demografik bilgiler, egzersiz değişim basamağı anketi), sözel veriler ise ses kaydının yapıldığı görüşmelerle yapılmıştır. İlk etapta 326 üniversite mezunu çalışana erişilmiştir. Bu üniversite mezunu çalışanlar akademisyenler, avukatlar, devlet memurları ve özel şirketlerde çalışanlardan oluşmaktadır. Öncelikle, bu kişilere “ Survey Monkey ” isimli internet servisi üzerinden egzersiz değişim basamaklarını anlayabilmek açısından çevrimiçi birer anket gönderilmiştir. Bu ankete göre ayrılan katılımcılardan her basamağa beş kadın ve beş erkek olacak şekilde rastgele seçilmişlerdir. Bu basamaklardan sadece birinci basamak çalışmaya dâhil edilmemiştir. Bunun sebebi bu basamaktaki kişilerin egzersiz yapmıyor olmaları ve önümüzdeki altı ay içinde de katılmayı düşünmüyor olmalarıdır.

Ankara’da yaşayan 20 kadın ve 20 erkek olmak üzere toplam 40 kişiden oluşan katılımcılar üniversite mezunu olmakla birlikte, tam zamanlı bir işte haftanın en az 5 günü çalışmaktadırlar. Katılımcı üniversite mezunu çalışanların hangi mesleklerden oldukları ise çalışmada göz ardı edilmiştir.

Çalışmaya başlamadan önce Orta Doğu Teknik Üniversitesi Uygulamalı Etik Kurulu’ndan gerekli izinler alınmıştır. Gönüllü katılımcılar çevrimiçi anketi doldurduktan sonra gerekli seçme işlemleri tamamlanmış ve çalışmaya dâhil edilmişlerdir.

Görüşmelerin ilk aşamasında çalışmanın temelini dayandığı altı sağlıklı yaşam davranışı (egzersiz davranışı, beslenme davranışı, sağlık sorumluluğu davranışı, hayatı takdir davranışı, sosyal davranış ve stres yönetimi davranışı) destek biçiminde görselleştirilmiş ve katılımcılara tanımlayıcı kartlarla sunulmuştur. Bu destekler; Egzersiz Davranışı Desteği, Beslenme Davranışı Desteği, Sağlık Sorumluluğu Desteği, Sosyal Destek, Stres Yönetimi Desteği ve Hayatı Takdir Desteği olarak altı başlıkta toplanmış ve 10 cm x 10 cm boyutundaki görsellerle gösterilmiştir. Bu kartlar dağıtıldıktan sonra katılımcılardan kartlar hakkında gelen hiçbir soru yönlendirici ya da yanıltıcı olunmaması için yanıtlanmamıştır.

Daha sonra katılımcılardan bu altı destek kartını (Egzersiz Davranışı Desteği, Beslenme Davranışı Desteği, Sağlık Sorumluluğu Desteği, Sosyal Destek, Stres

Yönetimi Desteği ve Hayatı Takdir Desteği) kendileri için önemine göre sıralama yapmaları istenmiştir. Bu sıralama sonucuna göre araştırmacı katılımcılara bu sıralamanın sebebini, her bir destek başlığı hakkında yaşanan sorunları ve çözüm önerileri sorulmuştur. Bu sırada katılımcı hem sıralamasının sebebi, hem de her bir destek başlığı hakkında bilgi vermiş olmuştur.

Son aşamada ise yine önceki aşamada kullanılmış olan destek kartları (Egzersiz Davranışı Desteği, Beslenme Davranışı Desteği, Sağlık Sorumluluğu Desteği, Sosyal Destek, Stres Yönetimi Desteği ve Hayatı Takdir Desteği) belirlenmiş olan zaman aralıklarına göre incelenmiştir. Bu sekiz zaman aralıkları tipik bir üniversite mezunu çalışanın günlük hayatından esinlenerek tasarlanmıştır. Bu sekiz zaman aralığı; (T1) sabah uyanmak ve evden ayrılmak arasında geçen zaman aralığı; (T2) işe ulaşım zaman aralığı; (T3) iş yerinde geçirilen zaman aralığı; (T4) öğle arasında geçirilen zaman aralığı; (T5) işten eve ulaşmaya kadar geçen zaman aralığı; (T6) evde uyuyuncaya kadar geçirilen zaman aralığı; (T7) uyku sırasında geçen zaman aralığı; (T8) rutinin değiştiği zaman aralığı olarak tanımlanmıştır. Araştırmacı burada yine destek başlıklarını tanımlayan kartları katılımcıya dağıttıktan sonra her bir zaman aralığına göre önem sırasına sokmasını istemiştir. Bu sıralamaların sonucuna göre her zaman aralığı için araştırmacı katılımcıya dört farklı soru sormuştur. Bu sorular temel olarak; her bir zaman aralığındaki sıralamanın altında yatan sebebi anlamak, bu zaman aralığında yaşanan sorunları anlamak ve çözüm önerileri getirmelerini sağlamak amacıyla sorulmuştur. Ayrıca tasarım açısından katılımcıların kişisel iletişim tercihleri de incelenmiştir.

Her bir görüşme ortalama 45 dakika civarında sürmüştür ve bu görüşmeler çalışma öncesinde, katılımcılardan izin alınarak, sesli olarak kayıt altına alınmıştır. Bu ses kayıtları, araştırmacı tarafından yazılı hale getirilmiş ve analize hazır hale getirilmiştir.

Toplanan veri iki biçimde analiz edilmiştir. Katılımcıların, sözel olarak ifade ettikleri, nicel veri olarak analiz edilmiş ve gruplandırılmıştır. Kullanıcıların yaptığı sıralamalar ise önce kadın-erkek seviyesinde analiz edilmiş, daha sonra istatistiksel olarak analiz edilmiş ve aralarında fark olup olmadığına bakılmıştır. Sonuçlara

gelindiğinde ise teknoloji temelli sağlık koçu ihtiyaçları öncelikle cinsiyete göre analiz edilmiş ve egzersiz desteğinin kadınlar için, sağlık sorumluluğu desteği için ise erkekler için birinci sırada olduğu anlaşılmıştır. Beslenme davranışı desteği ise hem kadınlar hem de erkekler için ikinci sırada yer almıştır. Öte yandan, sosyal davranış desteği kadınlar için son sırada yer alırken, erkekler için ise hayatı takdir desteği son sırada yer almıştır.

Sonuçları egzersiz değişim basamaklarına göre incelediğimizde hazırlık basamağı için sağlık sorumluluğu desteği ve beslenme davranışı desteği ilk iki sırada yer almaktadır. Yine beslenme davranışı desteği 3.basamak katılımcılar için ilk sırada yer almıştır. 4.basamak katılımcılarda ise beslenme davranışı desteği ve sağlık sorumluluğu desteği ilk iki sırada kendine yer bulmuştur. 5.basamaktaki kullanıcılarda ise egzersiz davranışı desteği ve beslenme davranışı desteği ilk iki sırayı almışlardır. Öte yandan, hayatı takdir desteği ve sosyal destek her basamakta son sırayı almıştır.

Zaman aralıklarına göre bakıldığında ise (T8) rutinin değiştiği zaman aralığı, (T6) evde uykuya kadar geçirilen zaman ve (T3) iş yerinde geçirilen zaman ilk üç sırada yer almıştır. Bunların nedenleri her bir zaman aralığına özgü bakıldığında değişen zaman aralıklarındaki değişen günlük ihtiyaçların sebep olduğu anlaşılmıştır. (T8) rutinin değiştiği zaman aralığında katılımcılar en çok egzersiz davranışı desteği, sosyal destek ve beslenme davranışı desteğini önemsemişlerdir. Bunun sebebi bu zaman aralığında belirtilen destek başlıklarının içerdiği davranışlardaki belirgin değişikliklerdir. Örneğin, katılımcıların bu zaman aralığında beslenme davranışı desteğini istemelerinin sebebi kahvaltı öğününde tüketilen miktarın artması ya da yemek saatlerindeki değişimin kişileri rahatsız etmesi sebebiyle destek almak istediği bulunmuştur.

(T6) zaman aralığı olan kişilerin evde uyuyunca geçirdiği zaman aralığında ise besleme davranışı ilk sıradadır. Bunun sebebi akşam yemeğinin bu zaman aralığına denk gelmiş olmasıdır. Bu zaman aralığında katılımcılar daha çok yemek içeriklerinin nasıl olması gerektiği hakkında bilgi edinmek istemektedirler. Ayrıca da ufak beslenme ipuçlarının da çok faydalı olacağını belirtmişlerdir.

(T3) iş yerinde geçirilen zaman aralığında ise katılımcılar genelde iş stresi üzerinde durmuşlardır. Buldukları ortamdan ya da yapmaları gereken işlerin onlara yüklediği yükten ya da sorumluluktan kaynaklı olarak stres oluştuğunu ve bunu yönetebilmek için stres yönetimi desteği istediklerini bildirmişlerdir. Bunun için temel olarak iş ve zaman planı yapan bir asistanlık sisteminin çok faydalı olacağını anlatmışlardır. Literatür de planlamanın stresi yönetmekteki en etkili unsurlardan biri olduğunu açıklamaktadır.

İstatistiksel sonuçlar ele alındığında ise üniversite mezunu çalışanların teknoloji temelli sağlık koçu ihtiyaçlarının cinsiyete göre değiştiği anlaşılmıştır. İhtiyaçlardaki bu değişimin detaylarına bakıldığında ise sebebinin sağlık sorumluluğu desteği üzerinden gerçekleştiği anlaşılmıştır. Sağlık sorumluluğu desteği kadınlar için üçüncü sırada yer almasına rağmen erkekler için birinci sırada bulunmuştur. Literatüre bu konuda bakıldığında, kadınların erkeklerden daha sık sağlık sorumluluğu davranışlarını sergiledikleri görülmüştür. Erkeklerde az görülen sağlık sorumluluğu davranışı eksikliğinin bu destek başlığı ile tamamlamak olduğu anlaşılmaktadır. Bir diğer istatistiksel sonuç ise üniversite mezunu çalışanların teknoloji temelli sağlık koçu ihtiyaçlarının egzersiz değişim basamağına göre değişmesidir. İhtiyaçlardaki bu değişimin detaylarına bakıldığında ise sebebinin stres yönetimi desteğinin 2.basamak ve 3.basamak arasında farklılaşmasıdır. Buradaki sebep ise kişilerin egzersiz yapmaya başlamış olmaları üzerinden henüz yeterli süre geçmediğinden kilo değişiminin gözlemlenmemesinin kişilerde oluşturduğu stresten kaynaklanmaktadır. Bu sebeple 3.basamaktaki katılımcıların 2.basamaktaki katılımcılara göre belirgin farklılıkla ihtiyaçlarının önemi değişmektedir.

Son istatistiksel sonuç ise üniversite mezunu çalışanların teknoloji temelli sağlık koçu ihtiyaçlarının günlük zaman aralıklarına göre değiştiğinin anlaşılmasıdır. Bu durum incelendiğinde tüm zaman aralıklarında [(T1) sabah uyanmak ve evden ayrılmak arasında geçen zaman aralığı, (T2) işe ulaşım zaman aralığı, (T3) iş yerinde geçirilen zaman aralığı, (T4) öğle arasında geçirilen zaman aralığı, (T5) işten eve ulaşımaya kadar geçen zaman aralığı, (T6) evde uyuyuncaya kadar geçirilen zaman aralığı, (T7) uyku sırasında geçen zaman aralığı, (T8) rutinin değiştiği zaman aralığı olarak] günlük aktivitelerin ve kişisel ihtiyaçlarının değişmesinden kaynaklandığı

anlaşılmıştır. Örneğin beslenme davranışı desteği (T1) sabah uyanmak ve evden ayrılmak arasında geçen zaman aralığı, (T4) öğle arasında geçirilen zaman aralığı ve (T6) evde uyuyuncaya kadar geçirilen zaman aralığında en yüksek öneme sahip olmuşlardır. Bu zaman aralıkları ana öğün zamanlarına geliyor olması bu sıralamanın temel sebebidir.

Çalışmanın bulgularına göre, üniversite mezunu çalışanların teknoloji temelli sağlık koçu ihtiyaçlarının cinsiyete (kadın & erkek), egzersiz değişim basamağına (Eğilim, Hazırlık, Eylem ve Devamlılık) ve günlük zaman aralıklarına [(T1) sabah uyanmak ve evden ayrılmak arasında geçen zaman aralığı, (T2) işe ulaşım zaman aralığı, (T3) iş yerinde geçirilen zaman aralığı, (T4) öğle arasında geçirilen zaman aralığı, (T5) işten eve ulaşıncaya kadar geçen zaman aralığı, (T6) evde uyuyuncaya kadar geçirilen zaman aralığı, (T7) uyku sırasında geçen zaman aralığı, (T8) rutinin değiştiği zaman aralığı] göre değiştiği bulunmuştur. Ayrıca sonuçlara bakıldığında beslenme davranışı desteğinin, egzersiz davranışı desteğinin ve sağlık sorumluluğu desteğinin genel olarak ilk üç sırada olduğu, bunun da üniversite mezunu çalışanların fiziksel sağlıklarına diğer sağlık boyutlarından daha fazla önem verdiklerini göstermiştir.

Bulgular ışığında teknoloji temelli sağlık koçu tasarımı altı farklı destek başlığı (egzersiz davranışı desteği, beslenme davranışı desteği, sağlık sorumluluğu desteği, stres yönetimi desteği, sosyal davranış desteği ve hayatı takdir desteği) üzerinden yapılabileceği anlaşılmıştır. Bu tasarım sırasında önceliği sağlık sorumluluğu desteği, egzersiz davranışı desteği ve beslenme davranışı desteği öncelikli olması gerekmektedir. Bulgulara göre üniversite mezunu çalışanların dört temel hedefte destek vermesi beklenmektedir; korumalı, değiştirmeli, yönetmeli ya da iyileştirmelidir.

Genel olarak bakıldığında ihtiyaçlar haricinde tasarım çözümlerinin ve karşılaşılan problemlerinde değiştiği bulunmuştur. Kadınların durumlar karşısında genelde kalıcı ve ayrıntılı çözümler istedikleri, diğer taraftan erkeklerin ise anlık ve geçici çözümler yönünde isteklerini sıraladıkları anlaşılmıştır. Teknoloji temelli sağlık koçu akıllı bir sistem şeklinde kişilere ihtiyaçlarına yönelik ve kişisel destekler vermelidir.

APPENDIX D

TEZ FOTOKOPİSİ İZİN FORMU

ENSTİTÜ

Fen Bilimleri Enstitüsü	<input type="checkbox"/>
Sosyal Bilimler Enstitüsü	<input checked="" type="checkbox"/>
Uygulamalı Matematik Enstitüsü	<input type="checkbox"/>
Enformatik Enstitüsü	<input type="checkbox"/>
Deniz Bilimleri Enstitüsü	<input type="checkbox"/>

YAZARIN

Soyadı : Kuru
Adı : Hakan
Bölümü : Beden Eğitimi ve Spor

TEZİN ADI (İngilizce) :

EXAMINING TECHNOLOGY BASED HEALTH COACHING NEEDS OF
COLLEGE GRADUATE EMPLOYEES

TEZİN TÜRÜ : Yüksek Lisans Doktora

1. Tezimin tamamından kaynak gösterilmek şartıyla fotokopi alınabilir.
2. Tezimin içindekiler sayfası, özet, indeks sayfalarından ve/veya bir bölümünden kaynak gösterilmek şartıyla fotokopi alınabilir.
3. Tezimden bir bir (1) yıl süreyle fotokopi alınamaz.

TEZİN KÜTÜPHANEYE TESLİM TARİHİ: