Community Readiness Assessment for the Dissemination of Evidence-based Physical Activity Programs for Older Adults in Astana, Kazakhstan

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Abstract

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The study aimed to assess the readiness of the community in Astana, Kazakhstan, to act on the issue of physical inactivity among older adults, and implement evidence-based programs to increase physical activity. In order to achieve this purpose, we used a validated community readiness tool based on the Community Readiness Model (Stanley et al., 2014) to assess the issue of interest in the context of a previously unstudied urban environment. Quantitative results suggested that the community readiness in Astana was equal to the score of 3.28 on a nine-point scale, which is equivalent to the stage of *vague awareness* in readiness. This means that most people recognized the issue as a local concern, but there was no immediate motivation to act on it. Qualitative analysis, however, indicated that community awareness might even be more limited and only certain groups such as fitness instructors and gerontologists expressed genuine

concern regarding the issue. We also established a number of barriers that prevented seniors from leading active lifestyles which included community misconceptions about older adult physical activity, family centeredness in older adulthood, scarcity of resources, passive support from the leadership, and lack of efforts in the community. Such qualitative research findings suggest a denial/resistance stage of community readiness in Astana and highlight the importance of conducting in-depth analysis of interviewee responses in addition to calculating readiness scores, when using the community readiness tool. We conclude that community-specific strategies for enhancing the level of physical activity among seniors are required to offset the disease burden associated with aging and to prolong life expectancy in the country. Introduction of evidence-based physical activity programs such as Enhance®Fitness in the community might be a promising route, but it would be of paramount importance to tailor such programs to local needs. Moreover, implementation of evidence-based physical activity programs for older adults should be accompanied by continuous monitoring and evaluation of the effectiveness and reach in the community.

INTRODUCTION

There is an overwhelming body of evidence to support the health benefits of physical activity. Regular involvement in physical activity is clearly associated with a reduced risk of premature mortality from any cause and acts as a means of primary prevention for many chronic conditions such as cardiovascular disease, diabetes and specific cancers (Warburton and Bredin, 2017). Many studies have also demonstrated that physical activity improves mental health, cognitive functionality and overall well-being (Reas et al., 2019; Panza et al., 2017). However, levels of physical inactivity are increasing at an ever-faster rate and it is estimated that almost a third of world population is not active enough, with a higher prevalence among women than men (Hallal et al., 2012). Overall, physical inactivity is the fourth leading risk factor contributing to deaths and the burden of disease globally. Among other "killer" factors are high blood pressure, smoking, high blood glucose and obesity (Lee et al., 2012). With the exception of smoking, three other leading risk factors are certainly connected to and their effects can be mitigated by physical activity alone (Blair et al., 2012). Considering global reach of the issue and its significant burden on the health of populations, Kohl and associates (2012) have called the problem of physical inactivity a pandemic.

In response to the issue, many national and international organizations have established policies and guidelines for promotion of physical activity. For instance, the WHO (2010) published the "Global Recommendations on Physical Activity for Health", where the minimum of 150 minutes of moderate or 75 minutes of intensive physical activity per week was advised for adults and older adults. The recent evidence from the literature, however, points at the curvilinear relationship between physical activity and health, suggesting that relative small improvements in behavior are still likely to result in mortality risk reduction and other health benefits (Warburton and Bredin,

2017). Such dose-response evidence indicates an even greater role of physical activity in preserving health and well-being.

Physical activity is also proven to be a significant element of successful ageing (Arem et al., 2015). With the projections of the world population of adults aged 65 and over reaching two billion in the next three decades, enhancing physical activity among seniors is seen as the most important approach to preventing and postponing age-related morbidity (Bauman et al., 2016). Among apparent benefits for older adults are increase in functional ability and reduction in the risk of cognitive decline (Paterson and Warburton, 2010). This in turn allows elderly people to maintain independence and self-reliance. Scientific evidence also suggests that physical activity prevents onset of diabetes and stroke, improves sleep and life satisfaction, and helps to build social networks in older adulthood (Bauman et al., 2016). A recent review by Bauman et al. (2016) provides a full list of evidence-based health benefits of physical activity in older age.

Despite these benefits, many seniors fail to achieve the recommended levels of physical activity. A little over half of older adults in the US reported missing a weekly target of 150 minutes of aerobic leisure activity (Carlson et al., 2010). Insufficient engagement in physical activity was also observed among seniors in England and China (Townsend et al., 2015; Zhu et al., 2016). While researchers find it difficult to measure physical activity levels in elderly objectively, one clear finding is that inactivity increases substantially with age across nations (Sun et al., 2013; Bauman et al., 2016). Therefore, it is highly imperative to promote physical activity for seniors in order to further increase the longevity and enhance the quality of life in older adulthood.

Enhance®Fitness

While any regular physical activity might be beneficial, evidence-based interventions have the greatest potential to improve the health and well-being of older adults (Batra et al., 2019). It has

been suggested that structured programs of physical activity enhance aerobic capacity, muscle strength and endurance (Belza et al., 2006). An increasing number of such programs have been developed across the US and several of them have been validated for effectiveness (PRC-HAN Physical Activity Conference Planning Workgroup, 2007).

Enhance®Fitness (EF) is an excellent example of an evidence-based physical activity program that has been researched substantially and implemented successfully on a wider scale. It is a low-cost, group exercise and falls prevention program that helps older adults at all levels of fitness become more active, energized, and empowered to sustain independent lives (www.projectenhance.org). The program is delivered in community settings such as senior centers, YMCAs, or community centers by certified instructors. Offered three times a week, each 1-hour session consists of stretching, low-impact aerobics, balance, and strength training – all aimed at increasing older adults' physical fitness and health (Wallace et al., 1998). Improved measures of effectiveness included upper and lower extremity strength, balance and mobility as well as perceived health status of seniors (Belza et al., 2006). Studies also showed that participation in EF is associated with lower healthcare costs, thus building a case for health plans and programs such as Medicare to support the coverage of older adult participation in evidence-based physical activity classes (Ackermann et al., 2008). A major advantage of EF is that exercises are modifiable and can be tailored to participant needs and physical abilities (Petrescu-Prahova et al., 2015).

Since its introduction in the 1990s, the program has been expanded to over 800 locations around the US (Snyder et al., 2015). Numerous studies have demonstrated high adaptability and positive outcomes of the program in various communities and ethnic groups (Palmer et al., 2016; Tomioka et al., 2012). Because the benefits of EF are clearly established, recent research has focused on developing effective dissemination strategies and building linkages between health care system

and community-based physical activity opportunities (Harris et al., 2011; Fishleder et al., 2018). However, the replication of the program outside the US is yet to be seen. A recent research conducted by Liu et al. (2018) looked at the feasibility of disseminating EF in China and concluded that local communities may not be ready for successful implementation of the program. The authors discovered that local communities may not be familiar with evidence-based physical activity programs and their impact on health. When asked about local programs, community leaders in China often referred to the ones which were not previously validated for effectiveness. In addition, resources in the community were found to be limited which also negatively affected the level of community readiness.

Study Purpose

To date, the literature has no evidence of evidence-based older adult physical activity programs present in Kazakhstan and EF could potentially be an ideal program to disseminate in the region, given its high adaptability and flexibility. However, it is important to consider carefully potential implementation of the program in a previously unstudied environment outside the US. The successful dissemination of evidence-based practices requires a thorough understanding of contextual factors (Ballew et al., 2010). For instance, community involvement in physical activity can be influenced to a great extent by social and economic conditions, availability of infrastructure, resources and networks (Gansefort et al., 2018). Therefore, in this study we aimed to (1) systematically assess the readiness of community to act on the issue of physical inactivity among older adults aged 60 and over in the city of Astana, Kazakhstan and (2) explore the readiness of the community to adopt an evidence-based program like EF. Presence of major cultural, social and structural distinctions between the US and Kazakhstan warrants such a preliminary assessment prior to potential dissemination of EF in the new setting. We believe the findings from the

community readiness analysis will help to identify locally tailored strategies for future adoption of evidence-based older adult physical activity programs in Central Asia and will facilitate the more rapid translation of empirical knowledge on the issue into action on an international scale.

BACKGROUND

Kazakhstan in Context

A former member of Soviet Union, Kazakhstan obtained its independence in 1991 (OECD, 2018). With the size equal to that of almost four Texas states, it is the 9th largest country in the world, although its population density is among the lowest ones globally (CIA, 2016). Located in the heart of Eurasia, Kazakhstan borders Russia to the north, China to the east and several other Central Asian countries to the south. In 2015, per capita GDP of the country was the equivalent of 10,400 USD, which ranks Kazakhstan among upper middle-income nations (IMF, 2017). Astana is the capital city of the country and has an official population of 1 million residents (CIA, 2018).

Population Demographics

Kazakhstan is estimated to have 17.8 million residents and a population density of 6.4 people per kilometer which is among the lowest in the world (OECD, 2016). Although the growth of population reached negative values during the first decade of independence, the demographic trend has experienced recovery since then due to a steady increase in the country's birth rate (World Bank, 2016; Sidorenko et al., 2018). The proportion of older adults aged over 65 is currently at 7% of the total population, having increased only slightly since 1965 (World Bank, 2016). In comparison, the average OECD country has seen almost doubling of the number of older adults in the same time period (World Bank, 2016). If we expand the indicator to include those who are between 60 and 65, then the size of the demographic group would be 10.7% of the country population (Sidorenko et al., 2018). The proportion of working age population relative to children and seniors has been declining steadily to move closer to OECD average of 47% (World Bank, 2016). Such tendency in Kazakhstan is largely driven by the shrinking of the pool of people

entering employment rather than aging of the population (OECD, 2016). While the effects of aging in Kazakhstan might not be as significant as in Western countries during the next few decades, the actual number of older adults will still be increasing year by year (Izekenova et al., 2015).

National Economy

Kazakhstan has gone through tremendous economic progress during the last two decades. Early years of independence were characterized by hyperinflation and deep recession before the country's economic performance started to improve rapidly at the turn of the century (OECD, 2018). Current per capita GDP represents a six-fold growth in the economy since 2002 (World Bank, 2018). This in turn has had a relatively positive impact on lowering poverty and income inequality levels in Kazakhstan (OECD, 2018).

Such strong economic growth was primarily possible because of consistent exportation of natural resources such as oil, gas and coal that are found in abundance in the country. For instance, by the end of 2010 70% of total export products came from fossil fuels (Satpayev and Umbetaliyeva, 2015). Heavy reliance on natural resources has slowed down the progress significantly in recent years due to global financial crises and a sharp drop in oil prices. Kazakhstan's revenue from export decreased twice between 2014 and 2015 (OECD, 2016).

While the oil boom stimulated the economy and improved the performance of the country in the region, lack of diversification has led to three major issues in Kazakhstan: stagnation in population standards of living, high levels of corruption, and unequal distribution of wealth (Satpayev and Umbetaliyeva, 2015). Based on previously published literature, Satpayev and Umbetaliyeva (2015) argue that dependence on oil industry does not create many employment opportunities for people and restrains the development of other economy sectors in Kazakhstan which has resulted

in a paradox commonly referred to as “resource curse”. The term explains the failure of nations to transform natural wealth into sustainable development, social prosperity and political stability (Heinrich, 2012).

Population Income

According to OECD reports (2018), real wages have risen by 280% throughout the last decade, which contributed significantly to the emergence of a middle class in Kazakhstan. Recent data from Trading Economics (2019) indicates that average monthly wages reached 172,066 KZT, whereas average individual cost of living is calculated to be around 86,000 KZT, which are equivalent to 452 USD and 226 USD respectively under current exchange rates. There are certainly regional differences and average indicators may not reflect real situations in individual cities or areas of the country. It is estimated that the gap in prices between cities and outlying regions in Kazakhstan is one of the largest in Europe and Central Asia (Seitz, 2018). Food, for example, in Astana is between 7 and 15 percent more expensive than the national average (Seitz, 2018).

Pension System

The pension system in Kazakhstan has gone through continuous reforms since 1998 and the current model is based on joint responsibility of the state, employers and the working population (Buribayev et al., 2016). Legal age of retirement is 63 years for men and 58 years for women (Pension Watch, 2015). As of 2015, there were 1,964,500 recipients of state pension in the country (Pension Watch, 2015). While work experience before and after the year of 1998 plays a major role in determining the amount of individual pension, the latest government reports (Zakon, 2018) show that average monthly pension in Kazakhstan accounted for 101,446 KZT (267 USD).

Media and Access to Internet

Media industry is heavily regulated and vast majority of radio as well as TV channels are owned by the state government. While commercial media projects are present, recent legislation requires any new outlets to obtain government registration before operation. It is believed that current media covers 99% of the population (CIA, 2016). Moreover, most people have access to the Internet and there appears to be approximately 14 million users in the country (CIA, 2016).

Healthcare System

Despite a rapid growth in the economy, Kazakhstan's total spending on health has remained stable at around 3% of GDP which is considerably less than in Western nations (WHO, 2016). In comparison, the US and Canada's investment in health accounted for 16.5% and 10% of GDP, respectively, in 2014 (OECD, 2018). A dominant part of that health care spending in Kazakhstan is aimed at improving hospital infrastructure and in-patient care (Sharman, 2014). Sharman (2014) argues that such a disease-centric approach had been inherited from the Soviet Union, and to this day medical professionals and public in general view efforts to treat diseases as more effective in improving health and well-being. Therefore, primary care and prevention measures have historically been underfunded in Kazakhstan. A report from Oxford Policy Management (2011) found that only 5% of national health care spending is devoted to disease prevention and primary care. This is particularly surprising because Kazakhstan has been promoting the importance of primary care on an international arena since 1978, when the Declaration of Alma-Ata was adopted at the International Conference on Primary Health Care (WHO, n.d.). The commitments of the Declaration to strengthen primary care provision were reaffirmed by global health care leaders at the recent Global Conference in Astana (WHO, 2018). A number of researchers (Sharman, 2014;

Aringazina, 2016) suggested a move away from a current medical paradigm towards a community-based approach that also embraces the focus on social determinants of health.

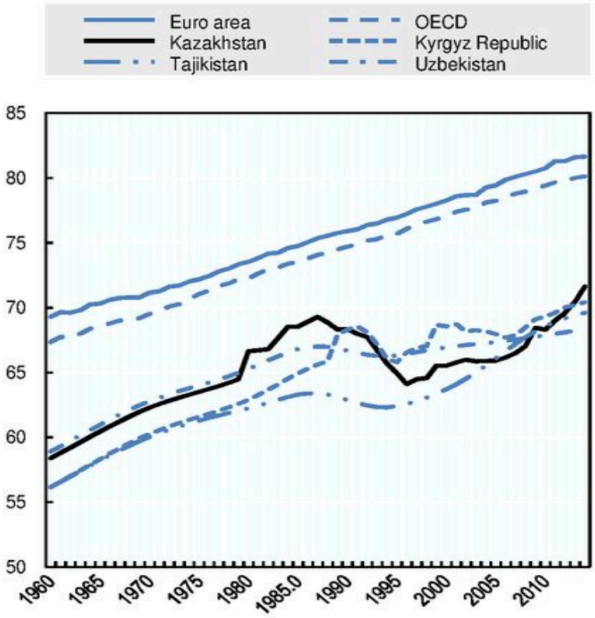
With regards to health care system, Kazakhstan has experienced several waves of reforms targeted at restructuring provision and financing of services in the country. During the first decade of independence the government attempted to decentralize the system and empower local health care authorities, but the efforts were unsuccessful and further plans for decentralization were abandoned (OECD, 2018). In recent years, the Ministry of Health has become increasingly responsible for health care policy-making, delivery and purchasing of services (Katsaga et al., 2012).

Since 2005, the work of Ministry of Health has been guided to a great extent by the state health care development programs. A new comprehensive national program is developed every five years to set out priorities for improving population health in the country. The original national program for 2005-2010 established, for instance, the National Center for Healthy Lifestyle that directs and performs health promotion and prevention activities on a local and national level (Aringazina, 2012). However, their work in addressing unhealthy behavioral factors appears to focus largely on smoking, alcohol consumption, drug abuse and obesity (National Center for Healthy Lifestyle, 2018). The state health care development program for 2016-2020 brought a greater emphasis on public health issues as evidenced by the creation of the National Agency for Public Health which implements a broad range of public health and epidemiologic policies (Ministry of Health, 2016). Nevertheless, the effectiveness of such policies remains to be seen. According to OECD experts (OECD, 2018), Kazakhstan's ambition to improve public health is yet to be translated into clear and evidence-based strategies.

Population Health Status

Very much like the economy, the Kazakhstan of today has improved considerably in many health status measures relative to the first decade of independent history. In 2015, average life expectancy at birth was equal to 71.2 years (Ministry of Health, 2016). This, however, indicates only two-and-a-half-year gain compared to the 1980s (OECD, 2018). As Figure 1 indicates, around the time of Soviet Union collapse Kazakhstan experienced a dramatic fall in longevity, hitting the lowest point of around 64 years of expected life at birth. Comparatively, OECD countries gained more than seven years in life expectancy over the same period (OECD, 2018). Despite that, there has been a strong upward trend in recent years, which has placed Kazakhstan ahead of neighboring countries such as Russia, Uzbekistan and Tajikistan, but life expectancy remains well below Western nations by comparison (OECD, 2018). For example, OECD average life expectancy is estimated to be 80.5 years at birth (OECD, 2018).

FIGURE 1. Life Expectancy Trends, 1960-2015

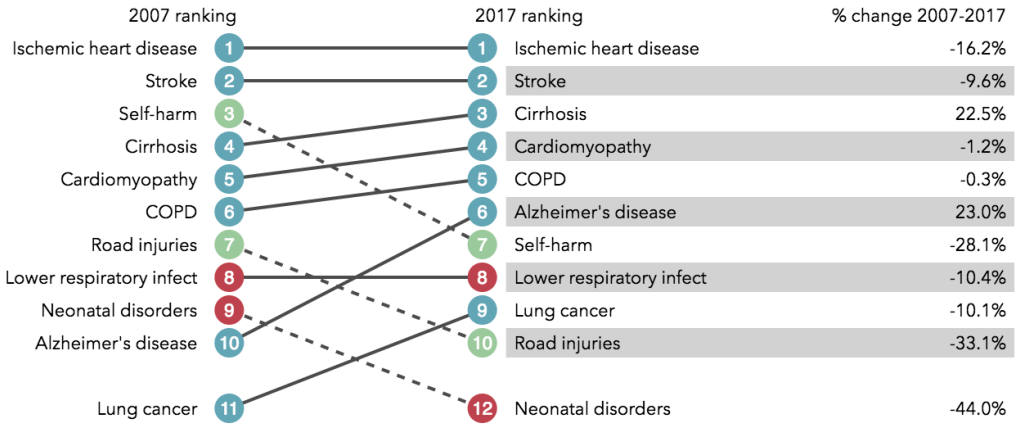


Source: OECD (2018)

It is important to point out that women in Kazakhstan can expect to live significantly longer than men, as evidenced by 8.9-year gender gap in longevity (IHME, 2017). With female life expectancy being 76.4 years, on average males live only 67.5 years (IHME, 2017). Regional differences also exist whereby residents of Astana have both the highest female (79 years) and male (71 years) life expectancy at birth (Ministry of Health, 2015). In contrast, the lowest longevity is expected in the Kostanay, Karaganda and Akmola regions, where females and males live 4 and 6 years, respectively, less than their counterparts in the capital (Ministry of Health, 2015).

Cardiovascular diseases place the greatest burden on the population of Kazakhstan. With a standardized mortality rate of 281.4 per 100,000 people, diseases of circulatory system are estimated to account for 53% of mortality in the nation (OECD, 2018). In particular, the death rate from stroke represents a three-fold higher burden than that of average European country (OECD, 2018). When calculating the burden of disease in terms of years of life lost (YLLs) and disability-adjusted life years (DALYs), ischemic heart disease and stroke were still ranked the top two causes of mortality and morbidity in Kazakhstan (IHME, 2017). An analysis across age groups demonstrates an even more alarming picture of the older adult population. It is estimated that cardiovascular diseases are the single leading cause of deaths for the age groups of 45-59 and 60-74 years (OECD, 2018). Over 40% of excess mortality among those who are 60 and older can be attributed to circulatory system disorders (OECD, 2018). Among top five causes of mortality in the country are also cirrhosis, cardiomyopathy and chronic obstructive pulmonary disease (Figure 2). Notably, the death rate from Alzheimer's disease has increased by 23% between 2007 and 2017. It is, however, important to interpret such significant increases with caution as the trend may be explained by changes in diagnosis and reporting of the condition (OECD, 2018).

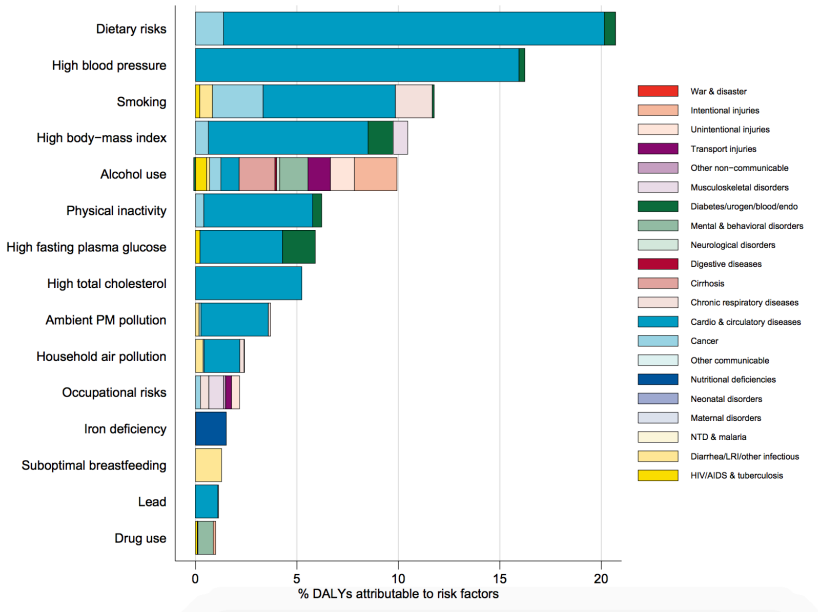
FIGURE 2. Top 10 Causes of Death, 2007-2017



Source: IHME (2017)

The leading population risk factors include dietary risks, high blood pressure, smoking, high body-mass index, alcohol use and physical inactivity (IHME, 2010). All these factors combined can help to explain the burden of cardiovascular disease in Kazakhstan (Figure 3).

FIGURE 3. Top 15 Population Risk Factors, 2010



Source: IHME (2010)

Physical inactivity as a risk factor is of particular significance to this study. While they do not provide the description for the measure of physical activity, Aringazina and colleagues (2012) report that adult participation in physical activity in Kazakhstan has slightly decreased from 18.6% to 17.6% between the years of 2007 and 2011. According to WHO (2016), prevalence of physical inactivity, defined as less than 150 minutes of moderate-intensity activity or less than 70 minutes of vigorous-intensity activity per week, in the country is estimated to be 27.5%. This is on a par with high-income nations such as Canada (28.6%) and France (29.3%) but substantially higher than estimates in neighboring countries like Russia (17.1%), Uzbekistan (19.1%) and China (14.1%). Gender-specific estimates do not indicate significant differences, with females in Kazakhstan being a little less active (2.6%) than their male counterparts (WHO, 2016).

Cultural Context

As described by Hofstede and associates (2010), culture represents the collective mental programming that creates a shared acceptance of something by the members of a nation or a group. It is embedded in the social environment and is a result of adaptation to certain conditions present in one's living world (Kagawa Singer, 2012). Defining the concept of culture and identifying clear pathways through which it affects health has been a challenging task, but the uniform agreement among researchers is that human behavior and especially lifestyle is culturally informed (Kagawa Singer et al., 2016). Potentially, geographical differences or national culture rather than ethnic background itself may play a more significant role in health outcomes (Kagawa Singer, 2012).

It is important to recognize that aging also occurs in a cultural context. It has been suggested that aging attitudes may vary across cultures (Löckenhoff et al., 2009). The experience of aging, the place of older adults in society, systems of care for seniors (family-based or institutional), all differ

based on culture. In this regard, Kazakhstan's culture is very likely to be distinct from the one prevalent in the US, for example.

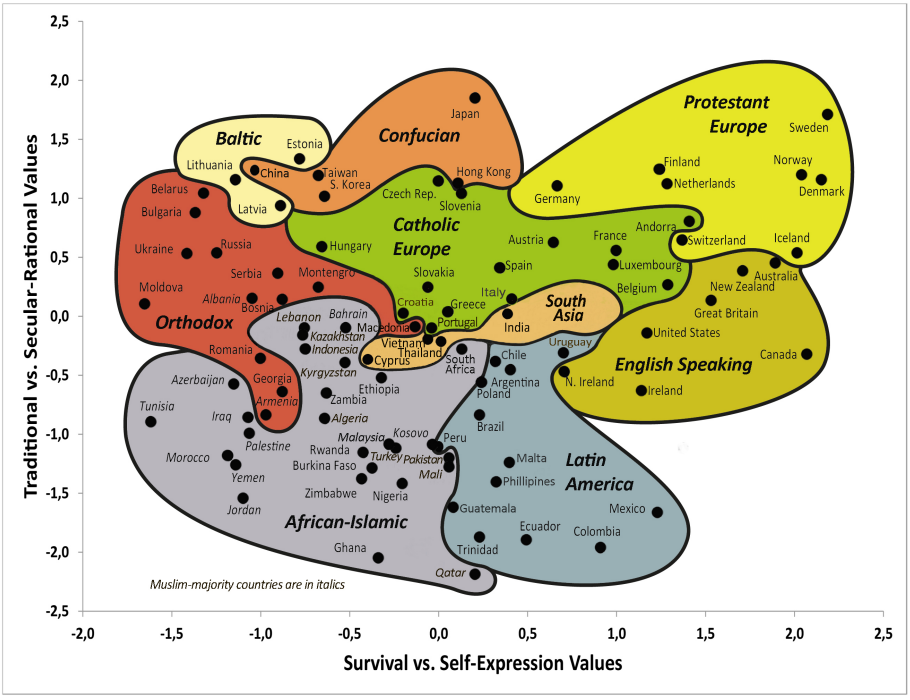
While acknowledging multidimensional and complex nature of culture, culture in Kazakhstan may be characterized as a set of values based on the results of the World Values Survey [WVS] (Inglehart and Welzel, 2015). It is an ongoing research project that was initially conducted in 1981 and is currently in its 7th wave of investigation. The aim of the study is to understand socio-cultural, moral, religious, and political values of diverse cultures around the globe (Institute for Future Studies, n.d.). The previously completed six waves of research demonstrate findings from representative samples of 97 countries covering 90 percent of the world's population (Institute for Future Studies, n.d.). Kazakhstan was included in the WVS for the first time in the 6th wave, which was completed in 2014 (Inglehart and Welzel, 2015). Approximately 1500 individuals from all regions of the country participated in face-to-face interviews, and to date, it is considered the most comprehensive investigation of Kazakhstani culture (Inglehart et al., 2014).

Inglehart and Welzel (2015) argue that there are two major dimensions of cross-cultural variation in the world: traditional versus secular-rational values and survival versus self-expression values. Traditional values emphasize the role of religious beliefs and family, closer ties between parents and children, and respect for authority. People who embrace these values also tend to reject divorce, abortion and euthanasia. Higher levels of national pride and nationalistic views are usually the characteristics of such traditional societies. Secular-rational values represent an opposite end of the continuum where societies are less concerned about religion, traditional family values, and authority. On a separate dimension, survival values place emphasis on economic and physical security. It is linked with a relatively ethnocentric outlook and low levels of trust and tolerance. In contrast, nations with self-expression values tend to care more about the quality of life and demand

greater involvement in economic and political life. Environmental protection, growing tolerance of LGBTQ communities, and gender equality are all features of self-expression focused cultures.

As illustrated by the global cultural map (Figure 4), Kazakhstan appears to be in between traditional to secular-rational values. At the same time, the nation's culture is still largely characterized by survival values.

FIGURE 4. Global Cultural Map



Source: Inglehart and Welzel (2015)

The WVS includes a number of questions about the community view of older adults, which are of particular interest to this assessment. The data shows that the position of seniors (>70 years) in society is average, i.e. their perceived positional ranking is equal to 5.20 out of 10.0. However, 64.4 percent of informants believe that older people are respected in Kazakhstan. Overwhelming majority (88.7%) also view seniors as not a burden to society. Moreover, when asked if older

people get more than their fair share from the government, 88.8 percent of individuals express disagreement. The statistics indicate a relatively positive perception of older age in the country.

In the above paragraphs, we present an overview of contextual factors that may influence and define the success of dissemination of evidence-based physical activity programs in Kazakhstan. While conducting a community readiness assessment on a country level would have been an ideal option, lack of resources restricted the scope of the study and the capital city of Astana, Kazakhstan, was chosen as a community of interest.

METHODS AND APPROACH

A cross-sectional community readiness assessment was carried out to determine the level of readiness regarding the promotion of physical activity for older adults in an urban community. The community, defined by the geographical area of Astana, comprised the single case study. The study protocol, which included procedures for quantitative and qualitative data collection and analysis, was reviewed and granted an exempt status by the University of Washington Human Subjects Division on May 23, 2018. The summary of qualitative methods and results presented below was guided by the standards of the Consolidated Criteria for Reporting Qualitative Research (COREQ) (Tong et al., 2007).

Conceptual Model

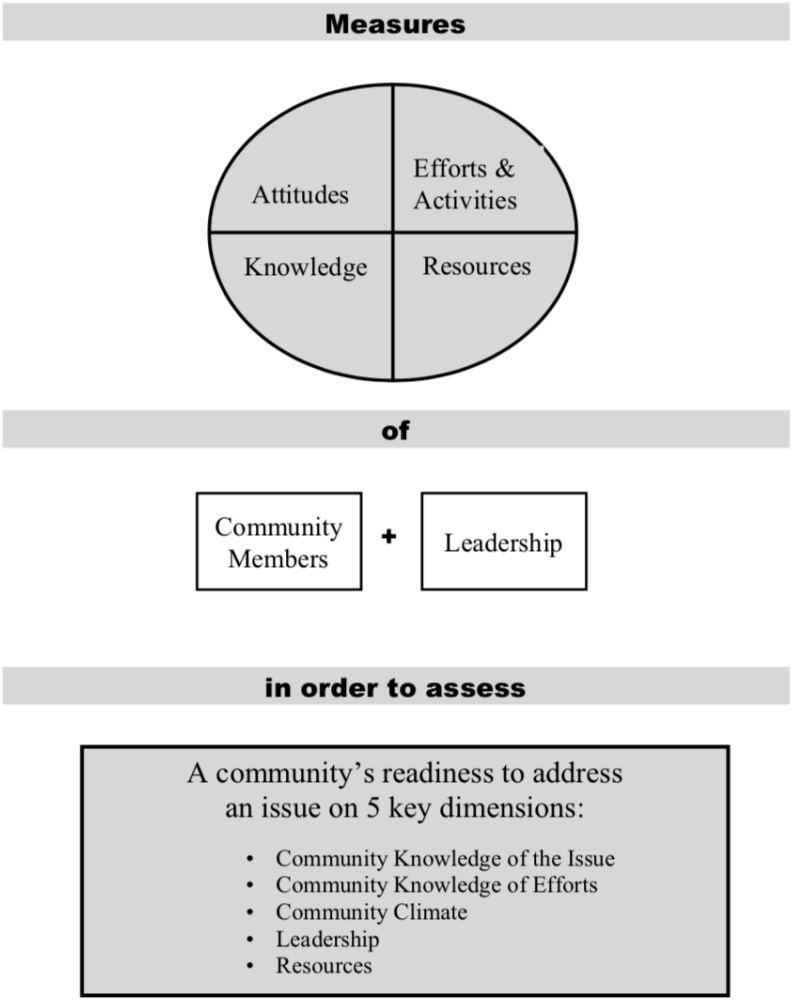
Community readiness is defined as the degree to which a certain community is willing and prepared to take action on a specific health problem (Stanley et al., 2014). The concept of community readiness builds on the individual level Model of Behavior Change (Prochaska and DiClemente, 1992) and applies a similar stage-based approach on a wider community scale. Thus, the resulting community readiness model (CRM) is considered to be a concept that integrates social and cultural contexts to determine the level of a community's awareness and its preparedness to act on an issue (Figure 5).

The following 4 assumptions are at the core of the model (Edwards et al., 2000):

- Communities are at different stages of readiness for addressing an issue;
- The stage of readiness can be accurately assessed;
- Communities move through stages to develop, implement, maintain, and improve effective programs;

- Interventions needed to move communities through the stages differ by stage of readiness.

FIGURE 5. Community Readiness Model



Source: Stanley et al. (2014)

Based on the CRM, researchers at the Tri-Ethnic Center for Prevention Research at Colorado State University (Edwards et al., 2000) developed one of the widely used tools for measuring community readiness (CRT). The tool provides a step-by-step protocol for the assessment of five dimensions of the CRM: (1) Community Knowledge of Issue, (2) Community Knowledge of Efforts, (3) Community Climate, (4) Leadership and (5) Resources. All dimensions are scored separately using a nine-point anchored rating scale before an overall numeric value is calculated for the community

readiness. Each score on the scale corresponds to one of the nine stages of community readiness, which are described in the Table 1.

TABLE 1. Stages of Community Readiness

Stage	Title	Description
1	No awareness	Issue is not generally recognized by the community or leaders as a problem (or it may truly not be an issue).
2	Denial/resistance	At least some community members recognize that it is a concern, but there is little recognition that it might be occurring locally.
3	Vague awareness	Most feel that there is a local concern, but there is no immediate motivation to do anything about it.
4	Preplanning	There is clear recognition that something must be done, and there may even be a group addressing it. However, efforts are not focused or detailed.
5	Preparation	Active leaders begin planning in earnest. Community offers modest support of efforts.
6	Initiation	Enough information is available to justify efforts. Activities are underway.
7	Stabilization	Activities are supported by administrators or community decision makers. Staff are trained and experienced.
8	Confirmation/expansion	Efforts are in place. Community members feel comfortable using services, and they support expansions. Local data are regularly obtained.
9	Community ownership/Professionalization	Detailed and sophisticated knowledge exists about prevalence, causes, and consequences. Effective evaluation guides new directions. Model is applied to other issues.

Source: Gansefort et al. (2018)

While the CRT was originally developed for the problem of alcohol and drug abuse, the tool has been used extensively in the fields of prevention and health promotion. It has been applied to the prevention of HIV/AIDS, childhood obesity, domestic violence, and tobacco smoking – to name a few (McCoy, 2007; Millar et al., 2013; Brackley et al., 2003; York et al., 2008). A recent systematic analysis of literature identified 40 studies that have applied the CRT to a wide range of issues across six different countries (Kostadinov et al., 2015a). An online version of the CRT has also been created and validated to make the process of assessment more efficient (Kostadinov et al., 2015b).

The research team considered a number of factors when deciding to choose the CRT for the assessment of community readiness for the dissemination of EF in Kazakhstan. The major advantage of the tool is that it offers flexibility in tailoring the approach to a particular health issue and a community. It also relies on the knowledge and experience of local experts which increases the accuracy of the assessment. Moreover, the CRT has been used successfully to analyze potential promotion and implementation of older adult physical activity programs including EF in the US, Germany and China (Jones et al., 2012; Gansefort et al., 2018; Liu et al., 2018). Previous studies have also reported the validity and high consistency of the tool (Oetting et al., 2001). Some studies have reported substantial time and resource commitment as the main disadvantage of the approach (Kostadinov et al., 2015a). Subjective scoring of interviews based on the anchored scale and reliance on key informant perspectives have also been mentioned among the limitations of the model (Kostadinov et al., 2015a; Lawsin, 2007).

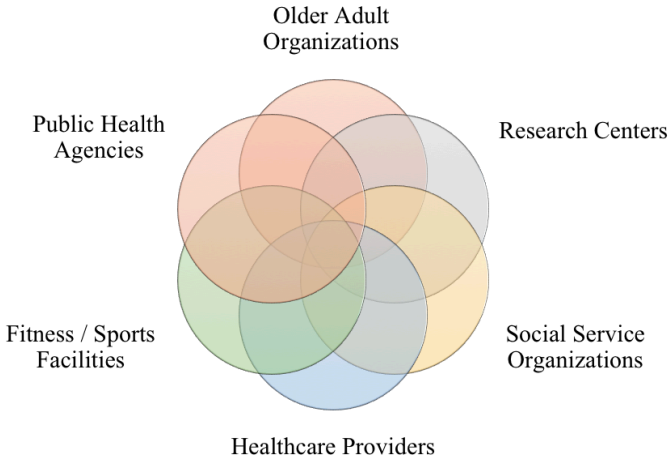
Participant Recruitment

The CRM authors argue that by interviewing key individuals with issue-specific experience and knowledge from several sectors, it is feasible to obtain "a relatively accurate picture" of a community's readiness without relying on an extensive number of survey responses (Stanley et al., 2014). Therefore, the research team used a purposive sampling technique (Palinkas et al., 2015) to recruit participants from a diverse range of community sectors to identify key informants. The team initially conducted a brainstorming session to identify six sectors wherein people may have a considerable knowledge about physical activity levels and older adult populations (see Figure 6). Then, we performed a further exploration using online search engines (e.g., Google, Yahoo) and leveraged personal connections to find specific organizations or individuals who met location and problem criteria. Seventeen potential interviewees were contacted by phone with the aim of

introducing to them the research study and to invite them to participate in the interview process, which was voluntary. The team did not offer any incentives for participation in the study.

Both the principal investigator and co-investigator were fluent speakers of English, Kazakh, and Russian, which helped to avoid any potential language-related barriers and biases in selection of participants. The CRM suggested interviewing 6-12 key informants depending on the size of the community. In this study, the final sample included ten (n=10) individuals representing five different sectors: (1) older adult organizations, (2) public health agencies, (3) fitness/sports facilities, (4) healthcare providers and (5) social service organizations. Representatives from research centers declined an offer to participate in the study.

FIGURE 6. Community Sectors Familiar with the Issue of Older Adult Physical Inactivity



Interview Guide and Procedures

The interview instrument (see Appendix A) was developed in accordance with the CRM and directly addressed all five dimensions of it. As suggested by the developers of the model, twenty-one compulsory questions were included in the guide. A number of introductory questions and four questions about evidence-based programs were added to gain a deeper understanding of

community readiness for the implementation of evidence-based older adult physical activity practices such as EF. The final version of the guide was translated into the Kazakh and Russian languages. The co-investigator then conducted two pilot interviews (one in Kazakh, one in Russian) to test the instrument. Interview questions were not shared with informants in advance in order to enhance the validity of findings.

All key informant interviews were conducted individually and in person between June and December 2018 at convenient locations chosen by the participants. It was important for the interviewers to build trust with key informants in person and to avoid loss of study participants. We used semi-structured format based on a single interview guide (Cohen and Crabtree, 2006). No relationship was established with participants prior to the study commencement, and no follow-up interviews were conducted. The team obtained a written consent form from each informant before the interview.

The principal investigator, a male Kazakhstan native and U.S.-based graduate student, interviewed six study participants, and the co-investigator, a female Kazakhstan native and a graduate student at U.S.-style local university, conducted four additional interviews. Before starting the interviewing process, both researchers had completed the first year of Master of Public Health programs at their respective universities and had received qualitative methods training from scholars with a cumulative experience of over 60 years in the public health research field.

While interviewees were given a choice of three languages, all of them preferred to answer the questions in Russian. Each interview, which lasted 45-70 minutes, was audio recorded with the permission of informants, and then transcribed verbatim by the online transcription software HappyScribe® (Happy Scribe Ltd., 2019). All transcripts were subsequently de-identified, cleaned, and uploaded onto a shared drive that was protected by a password known exclusively to

the investigators. For the purpose of creating a codebook for analysis, two random interview transcripts were translated into English by a professional translation agency based in Kazakhstan.

Analysis

Although ten interviews were conducted, we excluded one of them from the analysis due to lack of analyzable responses and failure to score two of the CRM dimensions. Hence, a total of nine (n=9) interview transcripts were subject to analysis.

We first performed quantitative analysis of participant characteristics and community readiness scores. Closely following the CRM tool and using the anchored rating scales that were part of the tool (Stanley et al., 2014), two investigators independently scored each of nine interviews. The process started with each investigator reading the transcripts to familiarize himself/herself with the content. For each interview transcript, we then highlighted and pulled excerpts pertaining to each of the five dimensions of the CRM. Using the excerpts, we went through the anchored dimension scales and identified whether references to the community exceeded each statement on the scale. We continued moving through each statement until we could not move on to the next statement in the rating scale - this point indicated that the community had not reached that stage yet and the previous stage was identified as the level of readiness. Each dimension score was determined in an identical fashion until the investigators completed scoring of all interview transcripts.

Then the principal investigator and the co-investigator discussed individual assessment discrepancies and produced a final table with consensus scores, which were used to identify average dimension-specific numeric values across all interviews. A global community readiness score – the arithmetic mean of five dimension scores – was calculated to determine the stage of community readiness for the implementation of evidence-based older adult physical activity

programs in Astana, Kazakhstan. As recommended by Kostadinov et al. (2015), we also calculated standard deviations of community readiness scores. The statistical software R Version 3.5.3 (2019) was used to complete all quantitative analysis.

For the purposes of qualitative data analysis, we developed an a priori list of codes based on the CRM tool and the interview guide. For instance, initial codebook included codes such as "current lifestyle", "community view of older adults", "community misconceptions", "efforts" and "funding of efforts". Using the inductive approach (Boaytzis, 1998), the principal investigator then coded two previously translated interview transcripts in order to identify any emergent codes. A chair of the thesis committee, an experienced qualitative researcher, reviewed the coded transcripts and provided feedback before the final codebook, which contained 29 a priori and 4 emergent codes.

Using the codebook, the principal investigator solely coded the entire dataset in the next stage of the analysis. Codes were then grouped into categories and eventually 15 themes were identified in the final analytic output. A chair of the thesis committee reviewed the themes and suggested names for each one. To integrate the thematic findings with the CRM, the principal investigator along with a chair of the thesis committee mapped the themes onto one of the five community readiness dimensions. Even though some of the themes could be related to more than one domain, we assigned each theme to the most relevant dimension for ease of interpretation. Dedoose® Version 8.1 (SocioCultural Research Consultants, 2018) was used for the purposes of qualitative analysis.

RESULTS

Participant Characteristics

All nine participants were directly involved in the provision of services to senior citizens or were actively engaged in policy issues that potentially affected older adult physical activity levels. Seven informants were female (78%) and two were male (22%). While the majority of interviewees were between 30 and 50 years old, two participants were over 60 years old. Table 2 illustrates the sample characteristics.

TABLE 2. Key Informant Characteristics (n=9)

Characteristic	n (%)
Gender	
Male	2 (22)
Female	7 (78)
Age category	
30-44 years	5 (56)
45-59 years	2 (22)
>60 years	2 (22)
Representative from:	
Older adult organization	1 (11)
Public health agency	2 (22)
Fitness / sports facility	3 (34)
Hospital / Healthcare provider	2 (22)
Social service organization	1 (11)

Representative job title:	
Director / Deputy director	2 (22)
Head of the department / unit	3 (34)
Fitness instructor	3 (34)
Cardiologist	1 (11)

Quantitative Assessment of Community Readiness

The overall readiness score was 3.28 (SD=0.30), which corresponded to the *vague awareness* stage of the CRM with regard to the promotion of older adult physical activity programs in Astana, Kazakhstan. The range of individual scores for each dimension of each interview was between 1.0 and 5.0. The highest average score of 3.72 (SD=0.79) was observed in the *Knowledge of Issue* dimension, whereas the *Knowledge of Efforts* domain received the lowest assessment score of 2.92 (SD=1.59). *Community Climate* and *Resources* dimensions had almost identical consensus scores of 3.31 (SD=1.22) and 3.33 (SD=0.45) respectively. Based on the individual consensus scores, the average score for the domain of *Leadership* was equal to 3.11 (SD=0.86). The results suggested that four out of five dimensions were at vague awareness phase of community readiness (Table 1). The only exception was the *Knowledge of Efforts* dimension, which was assessed to be at denial/resistance stage. Table 3 represents consensus scores across each dimension based on all key informants' answers.

TABLE 3. Domain Specific and Overall Community Readiness Scores

Dimension	Mean ± SD (Readiness Stage)
Community Knowledge of Issue	3.72 ± 0.79 (Vague Awareness)
Community Knowledge of Efforts	2.92 ± 1.59 (Denial / Resistance)

Community Climate	3.31 ± 1.22 (Vague Awareness)
Leadership	3.11 ± 0.86 (Vague Awareness)
Resources	3.33 ± 0.45 (Vague Awareness)
OVERALL READINESS	**3.28 ± 0.30 (Vague Awareness)**

Qualitative Assessment of Community Readiness

While the CRM did not require detailed analysis of the interview responses, the team aimed to obtain a more comprehensive understanding of community and the readiness scores observed in the quantitative analysis described above. In the following paragraphs, we present the key themes that emerged from in-depth analysis of qualitative interviews, organized by the five key dimensions of the CRM.

Domain 1: Community Knowledge of Issue

This domain addressed the scope of community members' knowledge, access to information and understanding of the impacts in relation to the issue of physical inactivity among senior citizens.

Limited awareness about the issue

There was a common general understanding in the community that physical activity was important in preserving physical and mental wellbeing, and hence was a significant factor in prolonging one's lifespan. Such knowledge about the importance of physical activity appeared to be passed on to younger generations as well:

"Once a week I try to go for a run together with my children because I am trying to show them that it's important to keep physically active – one certainly lives longer in motion."

(Deputy Director, Social Services Center)

However, while community members may have been aware of the issue in general and could explain the importance of physical activity, they appeared to have limited knowledge about specific mechanisms, causes, the scale of the problem, its effects on family and friends, and prevention measures:

"A lot of people do not even understand the mechanisms of how physical movements influence the body. They are overweight, do not move much, eat unhealthy. First of all, they do not move enough. When you explain those mechanisms, [the structure of] skeletal muscles, the effect of receptors that are in the joints and muscles, all the signals that enter the brain and how the brain sets the body for recovery and healing - many people just don't know it."

(Cardiologist, Hospital 1)

When asked specifically about the issue of physical inactivity among senior citizens, informants (8 out of 9) cited that there was lack of awareness about the problem in the community. Healthy lifestyle and physical activity in particular were attracting attention of younger community members but definitely not among older adults.

"They know very little about it. Now there is a tendency that young people are interested in healthy nutrition and physical activity, but they do not inform their moms and dads, other adults. In other words, younger generation are getting more

or less familiar with the issue and they try to follow a healthy lifestyle but do not inform their own parents who are over 60 years old."

(Head of Physical Therapy Unit, Hospital 2)

Lack of information about the issue

All interviewees agreed that there was lack of information about the issue of physical inactivity among older adults. The focus seemed to be on the consequences of the issue when clinical diagnoses and conditions were often discussed on TV and other media. One respondent mentioned that there was not a single TV channel or program/show devoted to healthy lifestyle that would raise the awareness of the community and older adults themselves about the issue.

"The issue is not covered on the media. It is discussed very superficially - let's say they are discussing an illness and then a doctor or a physical therapist just mentions that people need to eat properly, follow the diet regimen and be physically active. It's very superficial. They do not talk about the problem of physical inactivity in detail and the significance of physical activity in any form... shoveling the snow outside the house, walking in the fresh air, playing with children – these are all types of physical activity, but not everyone knows about it."

(Cardiologist, Hospital 1)

Informants (7 out of 9) pointed out that traditional media such as TV channels and newspapers, family members and medical professionals were the likely sources of information for senior citizens. A growing number of them were learning to use the Internet and online communication tools such as WhatsApp, but not everyone had access to such resources at that moment.

Community Misconceptions

According to three informants, older adults in the community may consider physical activity too risky or inappropriate for older age.

> *"Basically, one thing that older generation complains about is health. As they have more health concerns they become less active. They think, 'If I am sick, I must lie down and restrain from any movement, and others should serve me,'... They believe that extra physical movement can damage their joints, allocated time for each exercise might not be enough, and as if from the side they will look funny doing those activities."*
>
> (Deputy Director, Social Services Center)

One interviewee believed that this view was shared by the younger generations as well - they believed that engagement in physical activities might exacerbate their parents' and grandparents' current conditions and lead to health complications.

> *"One of the main [misconceptions] is when children become overprotective of their parents and do not want them to do absolutely anything…Their argument is that they have worked tirelessly throughout their whole life and now they are supposed to sit at home and do nothing. It's a false assumption."*
>
> (Cardiologist, Hospital 1)

A number of participants (3 out of 9) including representatives from a hospital and fitness facilities pointed out that physical activity was often seen by older adults as only a supplement to medications and conventional medicine. Seniors may have underestimated the importance of exercise, for example, compared to following medication regime. The emphasis seemed to be on finding an immediate rather than long-term solution to health-related issues.

"There may be misconceptions that physical activity is not so important for health. They may think that engaging in physical activities, keeping a diary of self-observation, and controlling [weight] is not as important as following a medication plan and taking pills as prescribed by the doctor."

(Head of the Department, National Public Health Agency)

Two informants noted that this misconception was also present among healthcare professionals. The main discussion during a patient visit was around the clinical concepts of a disease, its symptoms, and conventional treatment methods. A clinical specialist from a hospital went on to explain that primary care physicians may not have been familiar with therapeutic effects of moderate physical activity, and some of them were not engaging in physical exercise themselves.

"Doctors are not particularly familiar with sports either. They like to say, 'Try to walk more,' 'You need to be physically active,' and that's it! To someone who has been living a sedentary life for 40 years they say, 'You need to be physically active,' and expect him/her to go straight into running. The person doesn't even have a clue about proper running. If he/she does so, that's a straight recipe for stroke and heart attack!"

(Instructor of Nordic Walking, Independent Provider)

Domain 2: Community Knowledge of Efforts

The dimension assessed how much community members knew about local efforts, if any, their effectiveness, and accessibility for older adults.

Fragmented and rare efforts

Efforts from the government, private, and non-profit sectors aimed at increasing older adult physical activity were fragmented and rarely present. Scandinavian walking was the only example of a physical activity program mentioned by several interviewees (5 out of 9). Physical therapy sessions at hospitals, dancing and open-air physical activity classes were also available for community members. There existed government efforts to increase physical activity in the population, mainly by improving the public infrastructure, but none particularly focused on older adults.

> *"[Efforts] are aimed at increasing physical activity among the entire population. I have not seen a separate program specifically designed for the elderly - not from the private, nor from the public sector. Various events are held in the city parks free of charge and almost on an everyday basis during summer: yoga, pilates, cardio sessions, etc. So, a lot of different activities are carried out all around the city during summer months, but nothing is specific to older adults."*
>
> (Instructor of Physical Exercise Class, Fitness Center)

> *"Thanks to the city officials, there are now many special exercise areas in neighborhoods and people try to use the spaces and equipment for stretching and some kind of movement. But it's a very limited and short exposure to physical activity. There is no awareness or systematic approach."*
>
> (Instructor of Physical Exercise Class, Independent Provider)

Apart from that, some of fitness centers in the city provided discounts for senior citizens to encourage the use of sports and leisure facilities. However, informants (3 out of 9) believed that older adults often thought that fitness centers were for younger people, and it might be challenging

for elderly people. The following quote from a fitness instructor with experience working with seniors illustrated the point:

> *"I think many of [retired people] are just too shy to engage in physical activities: regardless if it is a physical therapy at the polyclinic or [exercise session] in the gym. They think it is for the young, healthy, and beautiful. They believe that they will not able to cope with the exercise load; they are afraid of showing their body; and they are genuinely concerned about the opinion of others. Judging by the people with whom I spoke, very few reach the gym in the end."*
>
> (Instructor of Physical Exercise Class, Fitness Center)

Limited knowledge about the efforts

Three out of nine informants could not name any physical activity programs in the city offered specifically for older adults. Those who were involved in designing or delivering services or heard about physical activity opportunities for senior citizens were uncertain of how widespread those activities were and if they were popular among older adult population.

> *"I find it hard to answer this question because I have not heard of such social projects aimed at encouraging older adults to engage in an active lifestyle. Maybe there are some, and I just don't know about them. I am personally not familiar with such programs. I mostly hear about attracting disabled people and children, but older people...although I heard that there are dancing classes for older adults. But I can't tell you how widespread these classes are."*
>
> (Deputy Director, Social Services Center)

According to informants (4 out of 9), a majority of community members were unaware or had limited knowledge about current and future efforts.

> *"We can see this by the way people call and come to us. They say, 'We have elderly parents, and we do not know what to do with them.' They ask for some kind of activities and events, but we are not aware of anything like that. Young people do not know what to do with their parents and grandparents."*
>
> (Director, Older Adult Organization)

Domain 3: Community Climate

This dimension intended to identify the prevailing attitude of community members towards the issue. It also addressed the role of physical activity as part of the current lifestyle of older adults and their view of older age in general.

Lack of physical activity among older adults

Informants believed that a majority of older adults led physically passive lifestyles. Some of them reached older adult years with health-related issues that limited their involvement in physical activities. One informant expressed an opinion that often, older people were too "lazy" to engage in physical exercise:

> *"We are lazy and don't want to get involved even if we know about the problem. Mostly laziness dominates to the extent that people don't want to do anything, don't listen to anyone's suggestions, and don't want to engage in any kinds of prophylactic measures. This leads to the point when there is nothing much to do to help [that person]."*
>
> (Head of the Department, Local Public Health Agency)

Although most of the senior population was physically inactive, certain groups attempted a more active lifestyle. It appeared that the amount of physical activity that older adults were currently engaged in depended on their educational and professional status. For instance, those who were still employed were more active compared to their retired counterparts.

> *"Frankly speaking, among the elderly population, those who are physically active are the ones who are successful and who occupy some positions as city mayors and higher rank officials. By virtue of their education, they now understand that they need to continue working and be fit to fulfill their responsibilities. They run marathons, engage in sports so as not to lose their positions and ranks. Among the rest of the seniors, who are not thinking about continuing their careers, there are very few involved in physical activity."*

(Head of Physical Therapy Unit, Hospital 2)

Family centeredness in older adulthood

Informants indicated that older adult life was traditionally considered as a period to be spent with family, grandchildren, and relatives where older adult physical activity was of little value to seniors themselves and their children.

> *"Our society knows that there is always a strong family platform - we are used to the fact that grandparents are the cornerstone of the family. If they are at home, it's cool and grandchildren are properly fed."*

(Director, Older Adult Organization)

After the age of 60, people may have become more heavily centered on family and household needs. Hence, their physical activity has been limited to everyday chores, such as grocery shopping and housekeeping.

> *"They are responsible for housework because their children are at work earning money. They just believe that at age 60 the active life is already over - time to be sick and stay at home. That's how it is. They spend the whole day taking care of grandchildren, cooking, grocery shopping, and chatting over the phone…Overall, there is very little physical activity."*
>
> (Instructor of Nordic Walking, Independent Provider)

Community view of older adults

According to informants, older adults were respected in the family and community. Their rare participation in physical activities was usually welcomed, but they were not seen as active members of the society. As cited by one of the key informants, TV commercials also portrayed older people as barely moving individuals. Another respondent suggested to think about common gifts that seniors received on birthdays and other occasions, and explained it in the following way:

> *"In our society, people very often present handkerchiefs, slippers, pajamas to older adults - all these gifts indicate that our view of an elderly is of isolated and closed person. So even with our gifts we push them in the corner. If the community members saw them as an active part of society, then they would be given sports shoes, a sports bag, ice skating gear, active outfit etc."*
>
> (Director, Older Adult Organization)

A matter of personal responsibility

Informants acknowledged community concern about the issue of physical inactivity among older adults was limited to a group of enthusiasts and certain professionals, whereas the community as a whole expressed no concern and considered it to be an individual level problem. Informants (6 out of 9) agreed that solving the issue should be a collaborative effort but at the end of the day the responsibility lay with the older adult population.

> *"I think hardly anyone is concerned about it. As a fitness instructor, I understand the beauty of physical activity and I encourage all of my elderly acquaintances and relatives to be active. I don't think someone else will be pushing his/her friends and say "let's go to fitness - we have to be physically active". No. Unless a person consciously decides to take action and do something for his health, no one from outside will be able to push him."*
>
> (Instructor of Physical Exercise Class, Fitness Center)

Moreover, informants believed the community in Astana was passively supportive of current efforts and that enhancing physical activity among seniors was not a priority for them at the time. Informants (5 out of 9) were skeptical about the problem becoming a real concern for the city residents in near future.

> *"No one has yet announced a problem like that. It's not a priority at all. Our society is not ready to act on it yet. Now fitness is experiencing some kind of a boom and maybe involvement of older adults will somehow be a priority in the future but it is not happening now. Probably, not going to happen soon. Another 30-50 years are perhaps needed for the society to see it as a real problem and for someone to start taking action on it."*
>
> (Instructor of Nordic Walking, Independent Provider)

Domain 4: Leadership

This domain aimed to understand the position of the appointed leaders and influential community members in relation the issue, and assessed their willingness to support current as well as future community actions.

Leadership definition

Key informants (7 out of 9) often defined leadership as city and state level governments as represented by ministries, public health agencies and city councils. Two physical activity instructors also acknowledged that leaders could emerge from the community of famous athletes and influential individuals, but even then it was important for them to build connections with the government in order to bring about change.

Passive support

Informants indicated that while the issue may have been a concern for the leadership, they showed no immediate motivation to act. Due to many other pressing issues needing attention and funding, older adult physical activity was not a priority. Therefore, current support was passive and depended on the type of resources required. For instance, the leadership would have been willing to organize media coverage of an event or help with finding a small space for a physical activity class; however, support beyond that was unlikely.

> *"In fact, there are a lot of problems in the country and I think that so far this problem of supporting the physical activity of older people has not been resolved, it has not been touched at all at the state level. At least I have not heard of it. This is only because we have so many different acute issues that need to be resolved."*
>
> (Instructor of Physical Exercise Class, Fitness Center)

A respondent from an older adult organization pointed out that the government's view of senior population was limited to pension reforms.

> *"When you ask about what is being done in relation to senior citizens, they [government officials] start explaining pension reforms. An elderly person is equal to pension affairs, and no one notices other aspects of older adult life."*
>
> (Director, Older Adult Organization)

Domain 5: Resources

The last dimension of the CRM explored the availability of local resources - human, money, space and others – for community members to use in support of efforts now and in the future.

Funding

Informants (6 out of 9) cited lack of financial resources as one of the most common barriers for seniors to engage in physical activities. Free opportunities had been accessible on a limited or seasonal basis, whereas fitness center memberships were unaffordable for the elderly for whom pension was usually a single source of income. Government funding was very scarce, and most of the older adult physical activities were self-funded or supported by family members.

> *"Low income is apparently one of the reasons. Without the support from children or relatives, it is challenging for them to cover such extra expenses. Their pension is barely enough for food and groceries, not to mention putting aside money for physical activity classes. There is not much of a support from the government, whereas private fitness clubs are unaffordable for the retirees."*
>
> (Instructor of Physical Exercise Class, Fitness Center)

When asked about alternative means of funding from grants and businesses, key informants (7 out of 9) were unable to provide examples, and explained that very limited financial support was available for promotion of older adult physical activity.

Human resources

While not readily available, informants suggested that volunteers could be found among community members. To them, youth were especially involved in volunteering, which might help in activating older adults. Their efforts, however, seemed to be limited in scope as they provided social support and assisted seniors with grocery shopping and other domestic work. In order to direct volunteer efforts towards effective promotion of physical activity among seniors, informants indicated that someone needed to train, organize, and mobilize them in a structured way.

> *"Speaking of volunteers, it seems to me that the problem lies precisely in the absence of an organizer or a leader who will be able to take the ownership of the problem, advocate for a solution, and use his/her skills as well as networks for the benefit of seniors…Volunteers can be easily recruited if there is a leader. Like we have seen before, volunteers are always there to help. Someone has to organize them."*
>
> (Head of Physical Therapy Unit, Hospital 2)

In terms of expert help, there appeared to be sufficient number of knowledgeable and skilled healthcare workers, public health practitioners, and fitness instructors in the community. Yet, they may not all be trained to work specifically with older adult population. Two key informants mentioned that special training, expertise, and desire were needed to successfully accomplish such work in the community.

"It's very hard for us to find employees who are qualified and who really want to work with older people. There needs to be an enthusiasm to work with them. Moreover, they pay is quite low in our field."

(Deputy Director, Social Services Center)

Spaces

During summer months, informants offered that outdoor spaces could easily be used for physical activity sessions, but indoor spaces may not be readily available free of charge. Availability would have also depended on the size of the required space. Throughout colder periods of the year, lack of indoor facilities in close proximity was thought to be a substantial barrier to physical activity.

"If [physical activity sessions] were organized close to their houses and for free, they could have used it and would have attended the classes. Without that, everyone is on his/her own."

(Head of the Department, National Public Health Agency)

Evidence-based programs in Kazakhstan

As part of the interview, we also showed each informant a short video from the EF class and asked a few additional questions. For most, the term "evidence-based program" was associated with a collaborative effort to collect and analyze robust data with the aim of drawing conclusions about the effectiveness of a proposed program.

Lack of funding, finding an indoor space, and/or reluctance of older adults were cited as potential barriers to the implementation of EF in Astana. Meanwhile, adapting the program to local culture, providing clear evidence of effectiveness, and adding EF to national health policy would be key facilitators.

"Exercise in general is recommended in our national standards and documents, but there is no specific program like that one. If this program is legalized and recommended by the government, we could start a pilot project in Astana and then it would be possible to transfer to other regions of the country. They would definitely use it at rehabilitation centers and for prevention measures. If there is any legal basis or recommendation, we would even be able to implement it here. I believe it would be a little challenging in the beginning to get people to use it, but over time they would see the pros and would definitely use it."

(Deputy Director, Social Services Center)

All informants also expressed willingness to support the implementation of EF in Kazakhstan in many ways, including providing access to facilities, participant recruitment, promotion of the program, and involvement in direct training of older adults.

"That will be a more in-depth and conscious approach. It is always interesting because the world is constantly moving forward and new techniques appear on the horizon. [Involvement in] such projects will always be very informative."

(Instructor of Physical Exercise Class, Independent Provider)

DISCUSSION

The study aimed to assess the readiness of the community in Astana, Kazakhstan, to act on the issue of physical inactivity among older adults. We also sought to explore the readiness of the community to adopt a specific evidence-based program such as EF. In order to achieve this purpose, we applied a validated community readiness tool to the issue of interest in the context of a previously unstudied urban environment. To our knowledge, this is the first effort to conduct a systematic evaluation of community readiness in Central Asia. Therefore, the concepts and methods of the study could be used by local researchers to conduct readiness assessments for other health and social problems in the communities of the region.

Community Readiness

Given the prevalence of traditional Eastern values and lack of evidence-based physical activity programs in Kazakhstan, we anticipated that the local community might score low in its readiness to challenge the current situation in relation to physical inactivity among senior citizens. In fact, quantitative analysis suggested that the community readiness in Astana was equal to the score of 3.28 on a nine-point scale, which is equivalent to the stage of *vague awareness* in readiness. This means that most people recognized the issue as a local concern, but there was no immediate motivation to act on it. Qualitative analysis, however, indicated that community awareness might even be more limited and only certain groups such as fitness instructors and gerontologists expressed genuine concern regarding the issue. Such qualitative research findings suggest a *denial/resistance* stage of community readiness in Astana and highlight the importance of conducting in-depth analysis of interviewee responses in addition to calculating readiness scores when using the CRT. They also suggest that a broader assessment of community readiness with a

greater number of key informants, which was not possible in this study, is needed in the future. It should also be mentioned that lower scores of readiness are common in the communities where CRT was used for preliminary studies before the introduction of certain prevention measures (Kostadinov et al., 2015a). Moreover, researchers argue that a low level of readiness does not necessarily demonstrate the community's resistance to change (Armenakis et al., 1993).

Our results suggest that community members in Astana were aware of the importance of physical activity in general and younger people in particular were increasingly engaged in healthy behaviors. However, participation of older adults in physical activities was largely limited to household tasks, especially among those who were no longer in employment. Similarly, the WVS showed that 97.9% of population aged over 50 in Kazakhstan were not members of any sport and recreational organizations (Inglehart et al., 2014). Combined, these results potentially indicate a very low level of physical activity among older adults.

The literature points to a myriad of factors affecting engagement of older adults in physical activity (Moschny et al., 2011; Bethancourt et al., 2014; Gothe and Kendall, 2016). While identification of barriers was not a specific goal of the study, through qualitative analysis of the interviews we established a number of obstacles that prevented seniors from leading active lifestyles. Physical activity was often perceived by community members, including the elderly, as a pursuit of younger people, which could be risky or inappropriate for older adults. There was also an emphasis on conventional treatment of health problems and a disease-centric view of aging. Such beliefs, coupled with lack of information about the issue, appear to have contributed to high levels of physical inactivity among senior citizens in Astana. Another common barrier was unaffordability of physical activity classes in the capital city. Free or discounted options were available to older adults in parks during the summer months, but regular fitness memberships, for example, had to

be purchased out of pocket or by family members. As evidenced by the results of the WVS (Inglehart et al., 2014), only around 16% of older adults in Kazakhstan could save money and the rest "just got by" or "borrowed money". This fact may justify low priority of physical activity among seniors.

While the prevailing attitude towards seniors in Astana was of respect, they were not necessarily seen as active members of the community and their roles were often confined within traditional family boundaries where seniors spent most of their time at home taking care of children and grandchildren. Likewise, the country and city leadership did not recognize the problem of older adult physical inactivity as a priority and was passive in offering a solution. Lack of concern about the issue in the community and among the leadership could explain the scarcity of efforts directed at increasing the level of older adult physical activity in the city. The efforts appeared to be fragmented and seasonal, which posed further barriers for seniors. However, it is important to examine the current situation while taking into account the broader country profile, which may provide some rationale for the issue being a low priority for the community and the leadership. As a developing country, Kazakhstan's government seems to be focusing on improving and diversifying the economy, and people are still driven by survival values of ensuring financial and physical security (Inglehart et al., 2014). In addition, the proportion of seniors in the country is significantly lower than in Western Europe and the United States, which could be distancing attention from the issues of older age including physical inactivity. At the same time, high mortality and morbidity rates from cardiovascular diseases among the population of older adults may in the near future incentivize the government to invest more resources in preventive initiatives such as increasing physical activity in older adulthood.

Strategies to Enhance Community Readiness

The assessment conducted in this study could be used as a starting point to promote community-specific strategies for enhancing the level of older adult physical activity in Astana. The authors of the CRT (Stanley et al., 2014) suggest directing the efforts at increasing awareness, empowering community groups and acquiring local support in order to move the readiness beyond the stage of vague awareness. For that purpose, studies from the US and China (Jones et al., 2012; Liu et al., 2018) have recommended disseminating the information about the benefits of physical activity through various printed (flyers, posters, newspapers) and electronic media (billboards, television channels). In this regard, the government of Kazakhstan can use its vast network of state owned or regulated media channels to inform the community about the issue and to promote greater involvement of seniors in physical activity.

Previous research has also suggested collecting and distributing the stories of older adults negatively affected by the lack of evidence-based physical activity programs, with the aim to improve the knowledge of the community about the issue (Liu et al., 2018). However, given that our results suggest that people in Astana may view physical activity as inappropriate for older adults, it might be more effective for leadership in Astana to disseminate success stories of physically active seniors, which could encourage others to engage in physical activity and potentially challenge the currently held views.

In the key informant interviews, Nordic walking was a commonly-mentioned physical activity program. While it is not targeted specifically at older adults, the program has been proven to be effective in improving heart rate, oxygen consumption and quality of life (Tschentscher et al., 2013). Promoting this program further may be a valid strategy to increase physical activity among older adults and to enhance overall community readiness.

Given that the country's governance structure is highly centralized, national policies are likely to be more effective in changing the current situation. For instance, inclusion of older adult physical activity promotion as one of the priorities in the next State Health Care Development Program may facilitate the adoption of evidence-based physical activity programs throughout the country. It would also encourage local public health agencies to monitor community engagement in physical activities by certain age groups, which is not the case at the moment. In addition, the Ministry of Health could join the global "Exercise is Medicine®" initiative to establish physical activity as a standard in health care delivery. The goal of the initiative is to institutionalize physical activity assessment and prescription into health care settings around the world (American College of Sports Medicine, n.d.). This in turn could aid the transition from a disease-centric clinical paradigm towards a more prevention-centric, whole-person view of health care. Promotion of older adult physical activity by health care providers may also increase the knowledge about the issue in the community.

Enhance®Fitness Dissemination

While wide dissemination of programs such as EF appears to be unfeasible at the moment in Astana, it would be beneficial to pilot an evidence-based older adult physical activity program in the near future. The fact that key informants expressed willingness to support the implementation of EF is an encouraging sign. Piloting such program will increase awareness about the issue in the community, hence enhancing the readiness for wider dissemination of evidence-based physical activity practices. However, certain barriers should be considered, and clear implementation strategies will need to be taken into account. First of all, the program has to be adapted to local culture and the starting point would be to choose a locally-informed name for the program. For instance, potential implementors of the program could learn from the study that evaluated the

adaptation of EF in Hawaiian communities (Tomioka et al., 2012). Apart from renaming the program, the team used different names for some of exercises, held classes on concrete floors and used folding chairs instead of straight-back ones as specified in the EF protocol.

It would also be crucial to solicit financial investment and support from local businesses and the government to able to offer physical activity sessions on a free or discounted basis during the early stages of implementation. Second, reluctance of seniors to participate may turn out to be the greatest barrier, given the cultural norms around physical activity for older adults. Therefore, it would be vital to obtain support from older adult community leaders and to involve them in every stage of the program planning and implementation.

Strengths and Limitations

We believe this study contributes to the body of implementation science research focused on dissemination of US-developed and tested evidence-based programs in other countries, as we assessed the feasibility of disseminating an existing evidence-based program in the culturally and structurally distinct environment of Kazakhstan. Moreover, in the vast majority of studies the CRM was used exclusively in a quantitative manner, whereas we went beyond that approach and also included a qualitative assessment of key informant responses which is a major strength of the study.

Our sample, however, included only 9 respondents. Although we ensured inclusion of representatives from a diverse range of fields, the study would have benefited significantly from a bigger sample size and a greater number of participants aged over 60. In addition, the concept of community readiness is community-specific, which limits the generalizability of the findings

outside the city of Astana. Given the number of interviews, reliance on personal knowledge and experience of key informants could also be considered as a limitation.

CONCLUSION

Our study demonstrated that the community in Astana, Kazakhstan, is at early stages of readiness to act on the issue of older adult physical inactivity. Community specific strategies for enhancing the level of physical activity among seniors are required to offset the disease burden associated with aging and to prolong life expectancy in the country. Introduction of evidence-based physical activity practices in the communities might be a promising route, but it would be of paramount importance to tailor such programs to local needs. Moreover, implementation of evidence-based physical activity programs for older adults should be accompanied by continuous monitoring and evaluation of the effectiveness and reach in the community.

REFERENCES

Ackermann R.T., Williams B., Nguyen H.Q., Berke E.M., Maciejewski M.L., LoGerfo J.P (2008). Healthcare cost differences with participation in a community-based group physical activity benefit for Medicare managed care health plan members. *Journal of the American Geriatrics Society*, 56, 1459-1465. DOI: 10.1111/j.1532-5415.2008.01804.x

American College of Sports Medicine (n.d.) *Exercise is medicine* [online]. Retrieved from https://www.exerciseismedicine.org/

Arem H., Matthews C.E., Lee I.M. (2015). Physical Activity Is Key for Successful Aging-Reply: Even a Little Is Good. *JAMA Intern Med,* 175, 1863.

Aringazina A., Gulis G., Allegrante J.P. (2012). Public Health Challenges and Priorities for Kazakhstan. *Central Asian Journal of Global Health*, 1(1), DOI: 10.5195/cajgh.2012.30

Aringazina A. (2016). Health Promotion and sustainable development in Kazakhstan. Chapter 4. In Cimadamore A., Mittelmark M., Lie G.T., Ottemöller F.G. (Ed.) *Development and Sustainability: The Challenge of Social Change.* London: Zed Books Ltd.

Armenakis A.A., Harris S.G., Mossholder K.W. (1993). Creating readiness for organizational change. *Human Relations,* 46, 681-703. DOI:10.1177/001872679304600601

Ballew P., Brownson R. C., Haire-Joshu D., Heath G. W., Kreuter M. W. (2010). Dissemination of effective physical activity interventions: are we applying the evidence? *Health education research,* 25(2), 185–198. DOI:10.1093/her/cyq003

Batra A., Palmer R.C., Bastida E., McCoy H.V., Khan H.M.R. (2019). Determining the Long-Term Effectiveness of a Group-Based Physical Activity Program. *Health Promotion Practice,* 20(3), 401–408. DOI:10.1177/1524839918769590

Bauman A., Merom D., Bull F.C., Buchner D.M., Fiatarone Singh M.A. (2016). Updating the Evidence for Physical Activity: Summative Reviews of the Epidemiological Evidence, Prevalence, and Interventions to Promote "Active Aging". *Gerontologist*, 56(S2), S268–S280. DOI:10.1093/geront/gnw031

Belza B., Shumway-Cook A., Phelan E. A., Williams B., Snyder S. J., LoGerfo J. P. (2006). The Effects of a Community-Based Exercise Program on Function and Health in Older Adults: The

EnhanceFitness Program. *Journal of Applied Gerontology,* 25(4), 291-306. DOI:10.1177/0733464806290934

Bethancourt H.J., Rosenberg D.E., Beatty T., Arterburn D.E. (2014). Barriers to and facilitators of physical activity program use among older adults. *Clinical Medicine & Research*, 12(1-2), 10–20. DOI:10.3121/cmr.2013.1171

Blair S.N., Sallis R.E., Hutber A., Archer E. (2012). Exercise therapy. *Scand J Med Sci Sports*, 22, e24-e28. DOI:10.1111/j.1600-0838.2012.01462.x

Brackley M., Davila Y., Thornton J., Leal C., Mudd G., Shafer J., et al. (2003). Community readiness to prevent intimate partner violence in Bexar County, Texas. *J Transcult Nurs*, 14(3), 227-36.

Buribayev Y.A., Mukaldyeva G., Nurahmetova G.G., Uteyev B., Nessipbekov Y., Khamzina Z.A. (2016). Pension Reform in the Republic of Kazakhstan: Main Directions, Conditions for Implementation and Development Prospects. *International Journal of Environmental and Science Education*, 11(18), 11611-11619.

Carlson S.A., Fulton J.E., Schoenborn C.A., Loustalot F. (2010). Trend and prevalence estimates based on the 2008 Physical Activity Guidelines for Americans. *Am J Prev Med*, 39(4), 305-13.

CIA (2016). *The world factbook* [online]. Retrieved from: https://www.cia.gov/library/publications/the-world-factbook/geos/kz.html

CIA (2018). *The world factbook* [online]. Retrieved from: https://www.cia.gov/library/publications/the-world-factbook/geos/kz.html

Cohen D. and Crabtree B. (2006). *Qualitative Research Guidelines Project* [online]. Retrieved from http://www.qualres.org/HomeSemi-3629.html

Edwards R.W., Jumper-Thurman P., Plested B.A., Oetting E.R., Swanson L. (2000). Community readiness: research to practice. *J Community Psychol*, 28(3), 291-307.

Fishleder S., Petrescu-Prahova M., Harris J.R., Steinman L., Kohn M., Bennett K., Helfrich C.D. (2018). Bridging the Gap After Physical Therapy: Clinical-Community Linkages with Older Adult Physical Activity Programs. *Innovation in Aging*, 2(1). DOI:10.1093/geroni/igy006

Gansefort D., Brand T., Princk C., Zeeb H. (2018). Community Readiness for the Promotion of Physical Activity in Older Adults - A Cross-Sectional Comparison of Rural and Urban Communities. *Int J Environ Res Public Health,* 15, 453. DOI:10.3390/ijerph15030453

Gothe N.P. and Kendall B.J. (2016). Barriers, Motivations, and Preferences for Physical Activity among Female African American Older Adults. *Gerontology and Geriatric Medicine*, 2, 1-8. DOI:10.1177/2333721416677399

Hallal P.C., Andersen L.B., Bull F.C., Guthold R., Haskell W., Ekelund U. (2012). Global physical activity levels: surveillance progress, pitfalls, and prospects. For the Lancet Physical Activity Series Working Group. *Lancet*, 380(9838), 247-57. DOI:10.1016/S0140-6736(12)60646-1

Happy Scribe Ltd. (2019) *HappyScribe Automatic Transcription Software*. Dublin. Retrieved from https://www.happyscribe.co/

Harris J.R., Cheadle A., Hannon P.A., Forehand M., Lichiello P., Mahoney E., … Yarrow J. (2011). A framework for disseminating evidence-based health promotion practices. *Preventing Chronic Disease*, 9, E22.

Heinrich A. (2012). Introduction: political challenges of a resource boom. In Heinrich A. and Pleines H. (Ed.) *Challenges of the Caspian resource boom: Domestic elites and policy-making.* Basingstoke: Palgrave Macmillan.

Hofstede G., Hofstede G.J. and Minkov M. (2010). *Cultures and Organizations: Software of the Mind.* 3rd Edition. McGraw-Hill.

IHME (2017). *Kazakhstan* [online]. Retrieved from http://www.healthdata.org/kazakhstan

IHME (2017). *GBD Profile: Kazakhstan* [online]. Retrieved from http://www.healthdata.org/sites/default/files/files/country_profiles/GBD/ihme_gbd_country_report_kazakhstan.pdf

IMF (2017) *World Economic Outlook.*

Inglehart R. and Welzel C. (2015). *World Values Survey. Findings and Insights* [online]. Retrieved from http://www.worldvaluessurvey.org/WVSContents.jsp

Inglehart R., Moreno H.A., Welzel C., Kizilova K., Diez-Medrano J., Lagos M., Norris P., Ponarin E. and Puranen B. (2014). *World Values Survey: Round Six - Country-Pooled*

Datafile. Version: www.worldvaluessurvey.org/WVSDocumentationWV6.jsp. Madrid: JD Systems Institute.

Institute for Future Studies (n.d.) World Values Survey [online]. Retrieved from https://www.iffs.se/en/world-values-survey/

Izekenova A.K., Kumar A.B., Abikulova A.K., Izekenova A.K. (2015). Trends in ageing of the population and the life expectancy after retirement: A comparative country-based analysis. *J Res Med Sci,* 20, 250-252.

Jones D.L., Settipalli S., Goodman J.M., Hootman J.M., Goins R.T. (2012). Community readiness for adopting a physical activity program for people with arthritis in West Virginia. *Prev Chronic Dis,* 9, 110-166. DOI:10.5888/pcd9.110166

Kagawa Singer M. (2012). Applying the concept of culture to reduce health disparities through health behavior research. *Preventive Medicine,* 55(5), 356-361. doi:10.1016/j.ypmed.2012.02.011

Kagawa Singer M., Dressler W., George S., Baquet C.R., Bell R.A., Burhansstipanov L., Burke N.J., Dibble S., Elwood W., Garro L., Gravlee C., Guarnaccia P., Hecht M.L., Henderson J., Hruschka D., Lewis-Fernández R., Like R., Mouton C., Myers H.F., Page J., Pasick R., Pescosolido B., Schoenberg N., Stoner B., Strayhorn G., Szalacha L., Trimble J., Weisner T.S., Williams D. (2016). Culture: The missing link in health research. *Social Science & Medicine*, 170, 237-246. DOI: 10.1016/j.socscimed.2016.07.015

Kohl H.W., Craig C.L., Lambert E.V., Inoue Sh., Alkandari J.R., Leetongin G., Kahlmeier S. (2012). The pandemic of physical inactivity: global action for public health. *Lancet,* 380(9838), 294 – 305.

Kostadinov I., Daniel M., Stanley L., Gancia A., Cargo M. (2015a). A Systematic Review of Community Readiness Tool Applications: Implications for Reporting. *Int. J. Environ. Res. Public Health,* 12, 3453-3468. DOI:10.3390/ijerph120403453

Kostadinov I., Daniel M., Stanley L., Cargo M. (2015b). Assessing community readiness online: a concurrent validation study. *BMC Public Health*, 15, 598. DOI: 10.1186/s12889-015-1953-5

Lawsin C.R., Borrayo E.A., Edwards R., Belloso C. (2007). Community readiness to promote Latinas' participation in breast cancer prevention clinical trials. *Health Soc. Care Community,* 15, 369–378.

Lee I.M., Shiroma E.J., Lobelo F., Puska P., Blair S.N., Katzmarzyk P.T. (2012). Lancet Physical Activity Series Working Group. Effect of physical inactivity on major non-communicable diseases worldwide: An analysis of burden of disease and life expectancy. *Lancet,* 380, 219–229. DOI:10.1016/S0140-6736(12)61031-9

Liu M., Zhang X., Xiao J., Ge F., Tang S., Belza B. (2018). Community readiness assessment for disseminating evidence-based physical activity programs to older adults in Changsha, China: a case for Enhance®Fitness. Global Health Promotion. DOI:10.1177/1757975918785144

Löckenhoff C.E., De Fruyt F., Terracciano A., McCrae R.R., De Bolle M., Costa P.T., … Yik M. (2009). Perceptions of aging across 26 cultures and their culture-level associates. *Psychology and Aging,* 24(4), 941–954. DOI:10.1037/a0016901

McCoy H.V., Malow R., Edwards R.W., Thurland A., Rosenberg R.A (2007). Strategy for improving community effectiveness of HIV/AIDS intervention design: The community readiness model in the Caribbean. *Substance Use Misuse*, 42, 1579–1592.

Millar L., Robertson N., Allender S., Nichols M., Bennett C., Swinburn B. (2013). Increasing community capacity and decreasing prevalence of overweight and obesity in a community based intervention among Australian adolescents. *Prev. Med.,* 56, 379–384.

Ministry of Health (2015). *Population Health in the Republic of Kazakhstan and Activity of Health Care Organizations in 2014.* Kazakhstan

Ministry of Health (2016). *Population Health in the Republic of Kazakhstan and Activity of Health Care Organizations in 2015.* Kazakhstan

Ministry of Health (2016). *State health care development program of the Republic of Kazakhstan "Densaulyk" for 2016-2020.* Retrieved from https://strategy2050.kz/static/files/pr/gprz_ru.pdf

Moschny A., Platen P., Klaassen-Mielke R., Trampisch U., Hinrichs T. (2011). Barriers to physical activity in older adults in Germany: a cross-sectional study. *The international journal of behavioral nutrition and physical activity*, 8, 121. DOI:10.1186/1479-5868-8-121

National Center for Healthy Lifestyle (2018). *Prevention of behavioral risk factors.* Retrieved from http://zozh.kz/

Oetting E.R., Donnermeyer J.F., Plested B.A., Edwards R.W., Kelly K., Beauvais F. (1995). Assessing community readiness for prevention. *Int J Addict*, 30(6), 659-83.

Oetting E.R., Jumper-Thurman P., Plested B., Edwards R.W. (2001). Community readiness and health services. *Subst Use Misuse*, 36(6-7), 825-43.

OECD (2016). *Multi-dimensional Review of Kazakhstan: Volume 1. Initial Assessment, OECD Development Pathways.* Paris: OECD Publishing. DOI:10.1787/9789264246768-en

OECD (2018). *OECD Reviews of Health Systems: Kazakhstan 2018.* DOI:10.1787/9789264289062-en

Oxford Policy Management (2011). *Report on current funds flow and current pattern of health care expenditure by economic and functional categories in public and private sectors and on the impact of the new budget re-allocation model in Kazakhstan.*

Palinkas L.A., Horwitz S.M., Green C.A., Wisdom J.P., Duan N., Hoagwood K. (2015). Purposeful sampling for qualitative data collection and analysis in mixed method implementation research. *Adm Policy Ment Health*, 42(5), 533–544. DOI:10.1007/s10488-013-0528-y

Palmer R. C., Batra A., Anderson C., Page T., Vieira E., Seff L. (2016). Implementation of an Evidence-Based Exercise Program for Older Adults in South Florida. *Journal of Aging Research,* 9630241. DOI:10.1155/2016/9630241

Panza G.A., Taylor B.A., Thompson P.D., White C.M., Pescatello L.S. (2017). Physical activity intensity and subjective well-being in healthy adults. *Journal of Health Psychol.* DOI:10.1177/1359105317691589

Paterson D.H. and Warburton D.E. (2010). Physical activity and functional limitations in older adults: A systematic review related to Canada's Physical Activity Guidelines. *Int. J. Behave. Nutr. Phys. Act.* 7, 38.

Pension Watch (2015). *Country profiles: Kazakhstan* [online]. Retrieved from http://www.pension-watch.net/country-fact-file/kazakhstan

Petrescu-Prahova M., Belza B., Kohn M., Miyawaki C. (2015). Implementation and Maintenance of a Community-Based Older Adult Physical Activity Program. *The Gerontologist*, 56(4), 677–686. DOI:10.1093/geront/gnv024

PRC-HAN Physical Activity Conference Planning Workgroup (2007). *Moving Ahead: Strategies and Tools to Plan, Conduct, and Maintain Effective Community-Based Physical Activity Programs for Older Adults.* Centers for Disease Control and Prevention: Atlanta, Georgia.

Prochaska J.O. and DiClemente C.C. (1992). Stages of change in the modification of problem behaviors. *Program Behavior Modification*, 28, 183–218.

R Core Team (2019). *R: A language and environment for statistical computing.* R Foundation for Statistical Computing, Vienna, Austria. Retrieved from http://www.R-project.org/.

Reas E.T., Laughlin G.A., Bergstrom J., Kritz-Silverstein D., Richard E.L., Barrett-Connor E., McEvoy L.K. (2019). Lifetime physical activity and late-life cognitive function: The Rancho Bernardo study. *Age Ageing*. DOI: 10.1093/ageing/afy188

Satpayev D. and Umbetaliyeva T. (2015). The protests in Zhanaozen and the Kazakh oil sector: Conflicting interests in a rentier state. *Journal of Eurasian Studies*, 6(2), 122–129. DOI:10.1016/j.euras.2015.03.005

Seitz W.H. (2018). *Urbanization in Kazakhstan: desirable cities, unaffordable housing, and the missing rental market (English)*. Policy Research working paper; no. WPS 8530. Washington, D.C.: World Bank Group. Retrieved from http://documents.worldbank.org/curated/en/956811531481933385/Urbanization-in-Kazakhstan-desirable-cities-unaffordable-housing-and-the-missing-rental-marke

Sharman A. (2014). A New Paradigm of Primary Health Care in Kazakhstan: Personalized, Community-based, Standardized, and Technology-driven. *Central Asian journal of Global Health*, 3(1), 186. DOI:10.5195/cajgh.2014.186

Snyder S.J., Thompson M., Denison P. (2015). EnhanceFitness: A 20-Year Dissemination History. *Frontiers in Public Health*, 2, 270. DOI:10.3389/fpubh.2014.00270

Sidorenko A.V., Eshanova A.K., Abikulova A.K. (2018). Aging of the Population in Kazakhstan: Problems and Opportunities. *Adv Gerontol,* 8, 12. DOI:10.1134/S2079057018010113

SocioCultural Research Consultants. (2016). *Dedoose Version 7.0.23*. Los Angeles. Retrieved from https://www.dedoose.com/

Stanley L.R., Oetting E.R., Plested B.A., Edwards R.W., Thurman P.J., Kelly K.J., Beauvais F. (2014). *Community Readiness for Community Change,* 2nd ed. Tri-Ethnic Center for Prevention Research: Fort Collins, CO, USA.

Sun F., Norman I.J., While A.E. (2013). Physical activity in older people: a systematic review. *BMC public health*, 13, 449. DOI:10.1186/1471-2458-13-449

Tomioka M., Sugihara N., Braun K.L. (2012). Replicating the EnhanceFitness physical activity program in Hawai`i's multicultural population, 2007-2010. *Preventing Chronic Disease,* 9, E74.

Townsend N., Wickramasinghe K., Williams J., Bhatnagar P., Rayner M. (2015). *Physical Activity Statistics 2015.* British Heart Foundation: London.

Trading Economics (2019). *Kazakhstan Average Monthly Wages* [online]. Retrieved from https://tradingeconomics.com/kazakhstan/wages

Tong A., Sainsbury P., Craig J. (2007). Consolidated criteria for reporting qualitative research (COREQ): A 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care,* 19(6), 349–357. DOI:10.1093/intqhc/mzm042.

Tschentscher M., Niederseer D., Niebauer J. (2013). Health Benefits of Nordic Walking: A Systematic Review. *American Journal of Preventive Medicine,* 44(1), 76-84. DOI: 10.1016/j.amepre.2012.09.043

Wallace J.I., Buchner D.M., Grothaus L., Leveille S., Tyll L., LaCroix A.Z., Wagner E.H. (1998). Implementation and effectiveness of a community-based health promotion program for older adults. *Journals of Gerontology: Medical Sciences*, 53, 301-306. DOI: 10.1093/gerona/53A.4.M301

Warburton D.E.R. and Bredin S.S.D. (2017). Health benefits of physical activity: a systematic review of current systematic reviews. *Curr Opin Cardiol*, 32(5), 541–556. DOI:10.1097/HCO.0000000000000437

WHO (n.d.) *Declaration of Alma-Ata* [online]. Retrieved from http://www.euro.who.int/__data/assets/pdf_file/0009/113877/E93944.pdf

WHO (2010). *Global Recommendations on Physical Activity for Health* [online]. Retrieved from https://europepmc.org/books/NBK305057

WHO (2016). *Insufficient physical activity: Prevalence of insufficient physical activity among adults 18+ (age-standardized estimates)* [online]. Retrieved from http://gamapserver.who.int/gho/interactive_charts/ncd/risk_factors/physical_inactivity/atlas.html?indicator=i1&date=Male

WHO (2018). *Declaration of Astana* [online]. Retrieved from https://www.who.int/docs/default-source/primary-health/declaration/gcphc-declaration.pdf

World Bank (2016). *World development indicators 2016 (English). World Development Indicators.* Washington, D.C.: World Bank Group. Retrieved from http://documents.worldbank.org/curated/en/805371467990952829/World-development-indicators-2016

World Bank (2018). *The World Bank in Kazakhstan.* Retrieved from https://www.worldbank.org/en/country/kazakhstan/overview#1

York N.L., Hahn E.J., Rayens M.K., Talbert J. (2008). Community readiness for local smoke-free policy change. *Am J Health Promot*, 23(2), 112-20.

Zakon (2018). *Average pension in Kazakhstan is 101,446 tenge* [online]. Retrieved from https://www.zakon.kz/4933715-srednyaya-pensiya-v-kazahstane.html

Zhu W., Chi A., Sun Y. (2016). Physical activity among older Chinese adults living in urban and rural areas: a review. *J Sport Heal Sci,* 5, 281–286.

APPENDIX A

Key Informant Interview Guide

Hello, my name is _____ and I am currently a master's degree student at the University of Washington in Seattle, USA.

Thank you so much for agreeing to be interviewed for this project. We are contacting key people to ask about lack of physical activity among older adults as it occurs in in the city of Astana in Kazakhstan. We thought you can be a good representative of the community of government workers/fitness centers/healthcare professionals/non-profit organizations/older people.

Let me assure you that the entire process including individual names will be kept strictly confidential and coded for purposes of analysis.

Just to be clear, when I refer to physical inactivity, I specifically mean lack of engagement in physical exercise that includes brisk walking, dancing, gardening, active involvement in games and sports with children, running, cycling, aerobics, snow shoveling and fast swimming. These are all examples of physical activities. Please, also keep in mind that we will be specifically talking about older adults who are aged 60 and over.

Finally, I would like to record our interview to better capture your answers. Would that be okay with you? Do you have any questions or concerns at this moment?

Then we are ready to proceed to the first question.

→ If the key informant is younger than 60, then ask the following question:

First of all, let me ask you to think of someone who is over 60 years old and lives here in the city. It can be a family member, friend or neighbor, for example. Do you remember someone like that?

1. As you now think about that person, how would you describe his/her lifestyle at this point in

life?

- What does he/she do on every day basis?
- What are his/her usual activities on weekdays? Is it the same during weekends?

→ If the key informant is 60 or older, then ask the following question:

First of all, let me ask a few introductory questions.

1. How would you describe your lifestyle at this point in life?

- What do you do on every day basis?
- What are your usual activities on weekdays? Is it the same during weekends?

2. Do you think this description applies to wider population of older adults who live in Astana?

- Why or why not?
- If not, then → How would you describe a typical lifestyle of an older adult living here in Astana?

3. What is the importance of physical activity in older age? Do you think it is important?

Now let's talk about the issue of physical inactivity among older adults. In other words, how much community here in Astana are aware about the issue, efforts to deal with that, resources available and so on.

COMMUNITY KNOWLEDGE ABOUT THE ISSUE

4. On a scale of 1 to 10, where a 1 is no knowledge and a 10 is detailed knowledge, how much do community members know about issue of physical inactivity in older age?

- **Why do you say it's a ____?**

5. Would you say that community members know nothing, a little, some or a lot about each of the following as they pertain to the problem?

→ Show them the printed scale and have them answer after each item

- How much people know about the lack of physical activity among older adults, in general?

→ Prompt as needed with 'nothing, a little, some or a lot'

- How much people know about the causes of the problem?
- How much people know about the consequences of not being physically active in older age?
- How much people know about the severity of the issue?
- How much people know about prevention measures or solutions to the issue?
- How much people know about the effects of the problem on family, relatives and friends?

6. What are the misconceptions among community members about the issue, e.g. why it occurs, how much it occurs locally, or what the consequences are?

- **If yes, then → What are these misconceptions?**

7. How the views of community members are formed? Where do they get the information about the issue?

- Do you think that information is correct and it's enough?
- Why or why not? Could you elaborate on that?

Now I am going to ask you about current community efforts to address lack of physical activity among older adults. By efforts, I mean any programs, activities, or services provided in Astana.

COMMUNITY KNOWLEDGE OF EFFORTS

8. Are there efforts in Astana that address the problem?

- If yes, then → Go to question 9
- If no, then → Go to question 16

9. Can you briefly describe each of these?

→ Write down names of efforts so that you can refer to them in question 10 below

10. About how many community members are aware of these efforts? Would you say none, a few, some, or most?

→ Show them the printed scale and have them answer after each item

- **Why do you say it's ____?**

11. Of those who are aware of the efforts, what do they know about them?

- Can they name the efforts?
- Do they know the purpose of the efforts?
- Do they know who the efforts are targeted to?
- Do they know how the efforts work (e.g. activities or how they are implemented)?
- Do they know the effectiveness of the efforts?

12. Are there misconceptions or incorrect information among community members about the current efforts?

- If yes, then → What are these?

13. How do community members learn about the current efforts?

14. Do community members view current efforts as successful?

- What do community members like about these programs?
- What don't they like?

15. Is there any plans for additional efforts to address lack of physical activity among older adults in Astana?

- What are these planned efforts? Can you provide more details, to the best of your knowledge?
- When are they planning to introduce it?

→ ONLY ask question 16 if the respondent answered 'No' to question 8 or was unsure.

16. Is anyone in Astana trying to get something started to address the issue of physical inactivity among older adults? Can you tell me about that?

- If yes, then → Who is trying to do this? What exactly they are trying to do?
- If no, then → Why do you think nobody is trying to address the issue?

For the following questions, please answer keeping in mind your perspective of what community members believe and not what you personally believe.

COMMUNITY CLIMATE

17. On a scale from 1 - 10, how much of a concern is lack of physical activity among older adults to members of community here in Astana, with 1 being "not a concern at all" and 10 being "a very great concern"?

- **Can you tell me why you think it's at that level?**

→ Ensure that the respondent answers this question in regard to community members, not in regard to themselves or what they think it should be.

18. How much of a priority is addressing physical inactivity among older adults to community members?

- **Can you explain your answer?**

→ ONLY ask question 20 if the respondent answered 'Yes' to question 8 (Yes, there are current efforts). If the answer was 'No', go to question 21.

19. Are community members supportive of current efforts to address the issue?

- **If yes, then → How do they show support? For example, is it more passive support or are they actively involved in planning or participating in the efforts?**

20. Do community members believe that any/additional community efforts are needed?

- **If yes, then → Under what circumstances would they support any/additional efforts?**
- **How might they show their support for more efforts? For example, would they get involved in planning or participating in the efforts or would their support be more passive?**

21. According to your community, whose responsibility is it to make older adults more physically active?

- Of the whole community? Government? Healthcare professionals? Older adults themselves?
- Why is it the responsibility of that particular group?

22. How does community view older adults, in general?

- Are there positive views? What are the positive views of older adults?
- Are there negative views? What are those?

Now I am going to ask you how the leadership in Kazakhstan perceives the issue of physical inactivity among older population. First, let me ask you → Question 24.

LEADERSHIP

23. How would you define 'leadership'? What does it mean to your community in Astana?

24. Using a scale from 1 - 10, how much of a concern is the issue to the leadership, with 1 being 'not a concern at all' and 10 being 'a very great concern'?

- **Can you tell me why you say it's a _____?**

25. How much of a priority is addressing this issue to leadership?

- **Can you explain why you say this?**
- **What is the priority right now for the leadership?**

→ ONLY ask question 27 if the respondent answered 'Yes' to question 8 (Yes, there are current efforts)

26. Does leadership support current efforts to address the issue?

- **If yes, then → How do they support? For example, is it passive support or are they actively involved in such things as planning or participating in the current efforts?**
- **If they are actively involved, then → How are they actively involved?**
    - Are they involved in a committee?

- Do they speak out publicly?
- Have they allocated resources to address the issue? Why or why not?

→ ONLY ask question 28 if the respondent answered 'No' to question 8 (No, there are no current efforts)

27. Would the leadership support any efforts in the community to address the issue?

- **If yes, then → How might they show this support? For example, by passively supporting or by being actively involved in planning or participating in the efforts?**
- Would they speak out publicly in favor of new efforts? Why or why not?
- Would they directly participate in planning or implementing new efforts? Why or why not?
- Would they allocate resources to new efforts? Why or why not?

28. Who are the leaders that are supportive of addressing this issue in your community?

29. Are there leaders who might oppose addressing the issue? How do they show their opposition? Who are these?

Let's talk about availability of resources for efforts to address the issue.

RESOURCES (time, money, people, space etc.)

→ If there are efforts to address the issue locally, begin with question 30. If there are no efforts, go to question 31.

30. How are current efforts funded? Is this funding likely to continue into the future?

31. What resources are available to address the issue of physical inactivity among older

adults in the community?

- Volunteers?
- Financial donations from organizations and/or businesses?
- Grant funding?
- Experts?
- Space/Building?

32. Would community members and leadership support using these resources to address the issue? Please explain.

33. On a scale from 1 to 10, what is the level of expertise and training among those working on the issue with 1 being 'very low' and 10 being 'very high'?

→ Refer to any organizations/individuals that were mentioned by the key informant earlier.

- Why would you say so?

34. Are you aware of any/additional proposals or action plans that have been submitted for funding to address the issue in the community?

- **If Yes, then → Please explain.**

Now let me extend our discussion to the topic of evidence-based programs. The answers to these questions don't necessarily need to reflect the community knowledge. You can answer from your own perspective.

EVIDENCE-BASED PROGRAM

35. Can you describe what evidence-based program is? How do you understand this term?

36. Have you ever heard of any evidence-based programs offered in Kazakhstan? It doesn't have to be related to physical activity.

→ At this point provide an explanation of EnhanceFitness program and show the video to support your explanation.

37. What would be potential barriers to implementation of such evidence-based program in Astana?

38. Would you or your organization be willing to support such program? In what way?

CLOSING

39. Do you have anything else to add? Are there any questions from your side that I can answer?

Thank you one more time for your participation!