

**Running Head: NUTRITION AND EXERCISE IN PRISONS**

**Improving the health of older prisoners: Nutrition and exercise in correctional  
institutions**

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### **Abstract**

This qualitative paper presents and compares the views of older prisoners and expert stakeholders on the topic of nutrition and exercise. The study highlights measures for improving the health of older prisoners. Older prisoners report the need to improve quality of meals provided in prison. They note that prison food is of poor quality and not adapted to their needs. With regard to exercise, they point out the lack of proper opportunities to engage in exercise and sports. They further discuss several factors that make physical activities either unsuitable or unfeasible. Expert stakeholders see prison as an opportunity to improve the health of those convicted of crimes. In light of the increasing number of older prisoners, age-appropriate nutritional and exercise interventions should take priority in prisons.

**Keywords:** older prisoners; nutrition; exercise; prison food; empirical research

## **Introduction**

A balanced diet and adequate exercise are critical components for maintaining a healthy lifestyle and preventing the rising numbers of non-communicable diseases. Cardiovascular illnesses and cancer continue to be the major causes of mortality both in the population-at-large, and for deaths in prisons (Donahue, 2014). Studies to date underline the poorer somatic and mental health of older prisoners compared with younger prisoners and older adults in the community (Fazel et al., 2001; T. Wangmo et al., 2015). Despite this knowledge, health-promoting choices and research for older prisoners is scarce, while its importance for the general prison population has been acknowledged (Condon et al., 2008; Elger, 2016). Furthermore, while global and national strategies are developed to combat poor choices in nutrition and physical inactivity in the general population (European Commission, 2010; WHO, 2007), the needs, conditions, and plans for doing the same among prisoners, particularly older prisoners, remain unmentioned and unexplored (UN, 2015). This is concerning in light of the increasing number of aging prisoners (Human Rights Watch, 2012; Prison Reform Trust, 2016), defined as those 50 years and older (Loeb & AbuDagga, 2006). In the United States, 18.6% of adult prisoners were 50 years and older (Carson, 2015), and the proportion of older prisoners in England and Wales as well as Switzerland stood at 13% of the prisoner population (Bundesamt für Statistik, 2015; Ministry of Justice, 2015).

### **Nutrition and exercise in prison**

In the prison context, with increasing disease burden and unmet healthcare needs (Fazel et al., 2004), ensuring balanced nutrition and physical exercise might be viable preventive measures to allow older prisoners to maintain or achieve good health status. A meta-analysis found that female prisoners are more likely to be obese and have an unhealthy diet than women in the general population, and that prisoners experience variation in health activity opportunities across different countries (Herbert et al., 2012). The authors concluded that health promotion among prisoners would be cost effective.

An examination of meals provided to prisoners in England revealed that prisoners have access to a nutritionally balanced diet, but they lack understanding of what comprises a healthy diet (Edwards et al., 2007). Other studies investigating prison food services discussed problems with limited financing and special dietary requirements (Collins & Thompson, 2012; Elger, 2016; Foster, 2006). Likewise, Condon and colleagues (2008) stated that prisoners faced challenges in making healthy choices, including nutrition and exercise, and these opportunities vary between prisons.

A Danish study highlighted the benefits of allowing prisoners to prepare their own meals and choose what they eat (Kjaer Minke, 2014). Vanhouche (2015) underscored the importance of prison meals and their preparation by examining the perceptions of Belgian prisoners transferred to a prison in the Netherlands. Most prisoners in this study thought negatively of the frozen meals which they received in the Dutch prison. Interestingly, several studies have captured the symbolism of food as a source of power for the prisoners as it allowed them to have some level of control in certain situations of their prison life (de Graaf & Kilty, 2016; Godderis, 2006; Kjaer Minke, 2014; Smith, 2002).

In relation to the positive impact of nutrition on health and behaviors, a Dutch study reported reduced antisocial behavior among prisoners who received nutritional supplements (Zaalberg et al., 2010). Plugge and colleagues (2009) concluded that inadequate nutrition and lack of exercise places prisoners at serious risk of cardiovascular diseases. An additional factor is the high prevalence of smoking in prisons (Ritter et al., 2011). Other studies demonstrated the benefits of exercise on inmate's physical and mental health (Cashin et al., 2008; Elger, 2009; Pérez-Moreno et al., 2007). In light of reduced depression scores, the authors of one study (Battaglia et al., 2015) recommended an hour of moderate physical activities for prisoners per week to improve mental health. Similarly other studies underlined the significance of physical activity for quality of life, rehabilitation, and social integration in prison (Ambrose & Rosky, 2013; Andrews & Andrews, 2003; Mannocci et al., 2015).

### **Study purpose**

Despite some literature on nutrition and exercise, few studies have delved into the opinions and needs of older prisoners. The studies mentioned above present perspectives of either prisoners or prison personnel but not both. Furthermore, many studies tackle the issues of nutrition and exercise separately. We chose to analyze the data on both topics together since choices regarding both are restricted in the prison context and both have the potential to influence the health of the prisoners. Thus the goal of the paper is to fill a research gap by presenting and comparing the views of aging prisoners and expert stakeholder participants on the topic of nutrition and exercise as preventive measures that can improve the health of older prisoners. This exploration depicts the challenges and barriers for older prisoners to access nutritional diets and adequate exercise when incarcerated. The study contributes important findings to inform the design and adaptation of programs for elderly prisoners.

### **Methods**

The data for this manuscript stems from a larger project carried out in Switzerland entitled "Agequake in Prisons." The project set out to investigate health care for aging

prisoners and their experiences in Switzerland and employed both qualitative and quantitative data collection. In addition, it sought views of experts working in the prison context from three countries (one being Switzerland). The project received approval from ten cantonal ethics committees in Switzerland and the other two participating European countries.

### **Study participants**

Study participants were recruited from 12 prisons in Switzerland (Wangmo et al., 2016). In this study, an older prisoner was defined as someone aged 50 years and older (Loeb & AbuDagga, 2006). We included the oldest prisoners in a given prison and only those who spoke French, German or English. In total, 35 older prisoners participated in this study. On average, they were aged 61 years (51 - 75 years), 30 participants were male, and 5 were female (Handtke & Wangmo, 2014; Tenzin Wangmo et al., 2015).

We also interviewed 40 stakeholders who were experts from Switzerland and two other European countries (for anonymity reasons, these two countries cannot be named). Again, the majority of stakeholder participants was male ( $n = 27$ ) and on average 49.5 years old (32 - 69 years). The stakeholders belonged to different professions: physicians, psychiatrists, nurses, health inspectors, researchers, prison administrators, policy makers, and employees at non-governmental and international organizations.

### **Data collection**

Older prisoners were recruited with the help of prison healthcare service employees who selected them based on their willingness to participate and provided them with written information about the study (Handtke & Wangmo, 2014). They organized a location for the interview within the prison. Before the interview, prisoner participants were again informed about the study, and that the researchers were from the university and independent of the prison administration. It was clarified that their participation had no consequences (negative or positive) on the duration of their sentence. After obtaining written informed consent, the researchers discussed older prisoners' healthcare and aging experience in prison, using a semi-structured interview guide. The interview guide, for example, contained questions on the following topics: personal information (i.e. demographics, social network and incarceration history); prisoners' health and access to health care; and being an older prisoner (e.g., end of life, prison housing, work responsibilities, retirement, free time activities and challenges of being in prison). Interviews were on average 96 minutes long, conducted in French and German, and audio-recorded. Several assistants transcribed the interviews verbatim and anonymized the transcripts.

A total of 77 possible stakeholders were asked to participate either via telephone or e-mail requests and 40 agreed to an interview. We categorized these stakeholder participants into three groups: 18 were healthcare professionals or researchers, 16 were prison administrators or policy makers, and 6 were scholars working with non-governmental organizations or international organizations. Interviews were conducted in person or via telephone or Skype. The languages of the interviews were French, English or German. The interviews were on average 75 minutes long, and subsequently transcribed verbatim and anonymized. Stakeholder participants were asked about their general experience in the prison context, issues concerning health and health care provided to older prisoners, aging in prison, and other issues such as work and retirement, free-time activities, compassionate release, and housing issues.

### **Data analysis**

Two members of the research team (VH and WB) extracted segments relating to the topic of the paper “nutrition and exercise.” The prisoner interview guide contained only one particular question relating to the subject: “Do you do any kind of physical activity in prison?” At other times the subject, particularly nutrition, was raised spontaneously during the interviews. Data analysis was carried out using thematic analysis (Braun & Clarke, 2006) since it allows identification and analysis of detailed patterns across the data set. The four authors were engaged in the data analysis. Two co-authors (VH and WB) were the PhD students on the project and completed their doctorate on this topic. They conducted most of the interviews. The first author co-supervised the entire project with the last author. The first author is trained in gerontology and methodology, and carried out some of the interviews as well. The last author is a physician by training, expert in prison issues, and an experienced qualitative researcher.

The first level of coding was done by VH, who inductively coded all extracted segments related to nutrition and exercise. WB and TW compared these coded segments with their coding (also inductive) of the German and English transcripts. Using the codes generated after checking the initial stage, TW analyzed these codes to develop themes. During this process a descriptive thematic analysis was used taking into consideration the information provided by the study participants. This analysis was checked by BE and resulted in three key themes and several sub-themes (Table 1) that capture the study purpose. Two themes were chosen from prisoners’ data: “improving prison food is imperative” and “challenges to exercise in prison”. Stakeholder participants’ interviews led to one theme relevant for this paper: “opportunities, changes and implementations”. Quotes presented in this paper were

translated from German or French to English and checked for accuracy. Prisoner participants' quotes are identified with P and stakeholder participants with S.

[Table 1 Here]

## Results

### Improving prison food is imperative

Older prisoner participants see the need to improve the quality of meals provided to them. They discuss this mostly by reporting how poor the food is in prison and how the needs of those who are older and ill are not considered.

#### Food is catastrophic

Many older prisoner discuss the poor quality of food that they receive in prison. They mention how unhealthy prison meals are: "This is not a healthy meal, what the people eat here. I am telling you the truth" (P34, 56 years). The same participant highlighting poor nutrition in prison further states, "They give me very bad meals. Too salty. It is not for ill people." Moreover, those who have diabetes also report that their meals are not adjusted to their health needs: "There is nothing for diabetics, nothing really. There is [only] sugar free Ricola and Coke Zero." (P31, 53 years). In addition, this participant further adds:

I just have the normal menu plus additional vegetables. I stick to the vegetables and leave the pasta, so I have a choice. Or when purchasing, to get more diabetic [friendly] products. It just doesn't get through [with the kitchen personnel], then they prepare Riz Casimir [Swiss dish consisting of rice with chicken, banana, pineapple and curry sauce]. For me as a diabetic there's just dry rice, dry chicken meat without curry sauce. (P31, 53 years)

Unlike the above where food was deemed unhealthy and inappropriate and therefore 'catastrophic', some prisoners who felt the same did so not on other basis such as lack of creativity on the side of prison kitchen personnel in food preparation: "He [the cook] doesn't know anything. Rice on Mondays, rice on Wednesdays, rice on Thursdays and on Fridays. I really like rice but you can prepare rice in different ways, but there's no imagination" (P19, 62 years). Similarly, others also are not pleased with the monotonous meals that they receive each and every week and felt that continuing to consume in such a manner would lead to food fatigue. Participants who are "Lifers" [i.e., those imprisoned for life] deem the monotonous food service as particularly harsh. Categorizing the food in prison as "catastrophic," a participant notes the following:

On Mondays you get Geschnetzeltes (meat cut into small thin slices), on Tuesdays you get goulash - every week the same food. It may be OK for people who stay here for a

short period of time, they won't notice, but when you are in here for two years and you have to eat the same thing every week! (P16, 59 years)

Only a very few older prisoners are not negative about their experience, since they deem poorer conditions to be an aspect of their imprisonment. One even reports that prison is not a four or five star hotel: "Well, there are people who complain about the food very much. Then I always think, my God, did they always use to eat in four- or five-star hotels?" (P15, 61 years).

Available and needed possibilities for improving nutrition

Several older prisoners report how their meals are not what they were used to prior to incarceration. Their diets were healthier with fruits, vegetables, and yogurts. Such items are provided to them in small quantities in prison, resulting in either having to buy them or having their families bring these items. Underlining that prison meals do not meet their needs, one prisoner notes: "Then I buy 14 yoghurts. Plain yoghurt because I don't like all the other yoghurts with artificial flavors and all that sugar. You get two little portions of cheese per week" (P35, 55 years). Others explain that there is the possibility to prepare meals and receive some budget to do so.

On Wednesday we discuss what to cook on Saturday, and everybody can say what he would like to eat, and usually we take that into account or we prepare things that are hardly ever offered. Although that's very limited as well [since a meagre amount of money per person is provided]. (P3, 58 years)

Participating older prisoners stress the need to address the nutritional needs of elderly prisoners and any special requirements required because of illness. One participant compared the experience of older and diabetic prisoners to prisoners with religious food requirements: "The needs of the Muslim and Jewish prisoners as well as vegetarians are considered, which is great. But for example that of older persons and diabetics are not" (P31, 53 years). Another participant further stressed the need for a better diet for older prisoners, stating:

Well, I have the normal things, like everybody else. ... But in old age for example you should have more [Vitamin] D. That's a known fact. And I couldn't say if in here they pay attention to that. (P27, 63 years)

Barriers to nutrition

A few older prisoners feel that their health status has deteriorated during the many years of imprisonment; with time, they have lost their teeth, and are in need of dentures. Loss of teeth is particularly problematic in terms of available prison meals and what they are able to eat. One participant explains:



I lost almost all my teeth, all of them during detention ... And now I have dentures since 17 years or so, and they broke and have been fixed several times [by the dentist], but he can't fix them anymore and now I cannot use the lower part at all ... [Eating has become] very cumbersome, because I can only press [with my gums] in those places, I can't chew anymore. (P24, 67 years)

Another participant describing the challenges to consuming meals states:

The problem is I can't bite. And then at first they [prison food service] tried to cook things soft. It didn't work, it always was the same food as for the others, and then it was recommended that they should try to blend it. So they took the meat, took the vegetables, everything in a pot and sh-sh-sh [imitates sound of blender]. Well, it looked like vomit. (P22, 65 years)

### **Challenges to exercise in prison**

Most of the older prisoners in this study report the presence of space and opportunities to undertake sports in prison. There are fitness rooms in prison: prisoners can engage in sports such as volleyball, football, table tennis, and walking groups. Several older prisoners note that they do not exercise mostly because they do not wish to or are not healthy enough to do so. A few felt that there is no need to exercise since they are working all day in prison. However, older prisoner participants discuss several factors that make physical activity either unsuitable or unfeasible.

#### **Bad conditions for exercise**

First, older prisoners mention that some sports are not suitable for them. For instance, an older prisoner feels that volleyball is not a physical activity worth spending time on, mainly due to their age and physical health status. They thus see several available activities as age-inappropriate and geared more towards younger prisoners who are into bodybuilding.

The last half an hour, they play volleyball and that isn't exactly my game. It includes a lot of jumping and bouncing and so on and like I said not exactly my thing. But I compensate by doing yoga and relaxation in my room. (P35, 55 years)

Similarly, another participant (P31, 53 years) also reports lack of interest in some sports which are more appropriate for younger prisoners: "I do not use the equipment for strength training and do not play hockey either." The same participant also carries out physical activities more suitable for older persons, "Every day for one hour I go outside and walk around the circle. And there is fresh air."

Second, in relation to lack of physical activity and limited choices of activities, older prisoners talk about their sedentary lifestyle in prison and conclude that this lifestyle is associated with their health problems:

And then you have zero movement ... of course then you get a lot of illnesses: back problems because in prison they have these lousy little mattresses ... And that you [researchers] have to do something urgently. So things don't get so far that people get sick in prison. (P22, 65 years)

Pointing to the lack of appropriate facilities, one older prisoner equates prison to a cage: "Like I said, it is our cage. We have a small loop road of about 25 meters where you can walk, but that's it" (P35, 55 years). Another participant also believes that the prison environment is problematic as it is not build in mind to ensure older prisoners' ability to exercise.

Especially older people who aren't that well health-wise, who can't go to health gymnastics, we have several people like that in this unit, they would like to do something, just within the limits of what's possible for them. But running around in the gym on the cold floor and things like that – that's just not possible. (P17, 67 years)

Finally, some older prisoners highlight other benefits of exercise which are not directly related to their physical health. They state that exercise helps to release aggression and is a distraction from prison boredom:

You know when there's aggressiveness, tension. All of a sudden soccer liberates them. And now that they [prison administration] have built the prison on the soccer field they haven't compensated it [the soccer field]. (P8, 60 years)

Interviewer: Have you noticed that there's more aggressiveness?

Not yet but it's more tense, more nervous. There are tensions. That builds up quickly. (P8, 60 years)

### **Implementing better uptake of healthy meals and physical activity**

Those stakeholder participants who discuss the topic of nutrition and exercise highlight the opportunity prison presents to improve the health of prisoners. They also point out the challenges that older prisoners face when it comes to nutrition and exercise (similar to those stated above) and suggest programs to improve nutrition and exercise opportunities for older prisoners.

#### **Prison as an opportunity**

Several stakeholders report that there are opportunities for prisoners to exercise and carry out physical activities since fitness rooms are available in prisons and there is an

organized schedule for activities such as walking. One even sees that prison is an opportunity to improve health promotion among older prisoners.

It's [prison] a really good opportunity to not just look at the person presenting in front of you but to actually be able to know exactly what the diet is, to be able to know exactly what exercise they might be doing, to know exactly whether they're smoking or not (S10, Healthcare Practitioner, Country A)

They highlight the opportunities available in prison such as the provision of information to prisoners on healthy diet and exercise. One stakeholder from country A states, "Some of the prisons offer nutritional advice, they have people come to talk about what particular exercises might be useful" (S17, Healthcare Practitioner). The same stakeholder also notes that availability varies based on prison.

You know, things like healthy eating, but that's very localized and very much dependent on how good each establishment or each prison is at dealing with or spotting what's needed for our aging prisoners. So it tends to be very patchy in terms of engaging rehab services, of healthcare prevention, and education.

However, another stakeholder expresses that irrespective of what is available in prison, adoption of healthy behaviors depends on the personal motivation of the individual prisoner. In line with this, a few participants find that making healthy behaviors obligatory might be necessary to motivate older prisoners, "At the older prisoners section, there are health exercise [sessions] that we are trying to make obligatory. But it is like everywhere, there is need for a certain pressure" (S5, Prison Administrator, Switzerland). Another participant highlights the importance of ensuring that opportunities are available.

First of all, we put an offer "sports and movement" at their disposal and that is one of the classics. Someone who is already motivated anyway and has some body consciousness and wants to stay fit will take advantage of that as much as possible. That is okay (S2, Prison Administrator, Switzerland)

One stakeholder who is more pessimistic about adoption of healthy choices by prisoners states that if prisoners have not taken care of themselves prior to imprisonment, they will not start doing it in prison.

When someone reaches a certain age, 70 years or 65 years, and has never engaged in any sports, has never had any personal hygiene, a physical activity, smokes, is obese - it's not in prison that the person will start to change his/her life style. (S27, Healthcare Practitioner, Switzerland)

### Addressing nutritional needs and providing opportunities

Underlining that there are older prisoners who have different nutritional needs because of their health status (i.e. diabetes), some stakeholders mention efforts to address this need by arranging and informing older prisoners about healthy food choices.

For example, if there is a patient who has diabetes on the occasion of the appointment, during my appointment I take a lot of time to explain at the nutritional level what she/he can and can't do. Well (...) so to say. Knowing that in here, they are entitled to trays that they call diabetic, plus snacks. So this is really well even. (S12, Healthcare Practitioner, Country B)

A few stakeholders also mirror what older prisoners report vis-à-vis quality of food and being a lifer. That is, how boring it might be for prisoners serving life sentence to receive the same meals every week for years and years. Thus they feel that providing prisoners the choice to cook their meals and select what they wish to eat not only helps overcome monotonous prison life but also improves their health.

I also think from the food point of view. I mean, if someone is here for one or two years that can be okay. But at some point you have cravings that you cannot satisfy there, just for the reason that the cooking is always somehow the same. Well, it's like that ... And I think that that's the problem. ... We could do that here, too. There are even units where they can prepare their food occasionally. (S40, Healthcare Practitioner, Switzerland)

Finally, in order to address the specific needs of older prisoners, one stakeholder reveals a program to support their health.

I already designed a concept [to improve physical activity] which I am hoping to put into practice next year. The plan is to specifically do some light workout with them, some walker training and also maybe going outside on the meadow doing some Nordic walking with them. Something like that which we do not have at the moment, but which could be put into practice quite easily even with limited resources. (S39, Prison Administrator, Switzerland)

### Discussion

This study fills gaps in the literature since we present perspectives of two groups who discussed the practical issues of quality of food and physical activity. Other studies to date capture either the perspective of the prison administrators or prisoners (Edwards et al., 2007; Herbert et al., 2012; Smith, 2002; Vanhouche, 2015), but not older prisoners. By highlighting the voices of the participants on this topic, we underline the challenges and provide

recommendations to address the noted problems. Considering the rising number of older prisoners worldwide (Human Rights Watch, 2012; Prison Reform Trust, 2016) and cost associated with caring for them (Maschi et al., 2013), a particular emphasis on factors that could contribute to their better health may not only be cost effective but also an ethically relevant public health measure.

The findings reveal the various factors that curtail the ability and willingness of older prisoners to adopt better nutritional and exercise behaviors. Calls for adapting prison food to make it healthier and for it to be responsive to the health needs of ill and older persons are valid. Ensuring that prisoners receive appropriate food is in accordance with the Mandela Rules (UN, 2015). The findings in the available literature indicate the critical role that food plays in both improving the health of prisoners and reducing their aggressive behaviors (Elger, 2016; Pérez-Moreno et al., 2007; Plugge et al., 2009; Zaalberg et al., 2010), providing a strong case to put all possible efforts into improving the quality of food provided in prisons. This could include simple measures as follows. First, food could be made to appear appetizing and monotonous menus could be avoided. For example, this could be done by ensuring that rice is not provided each day of the week (since it is not healthy for those who have diabetes), and even when it is (due to budget restrictions), there certainly are different ways of making a rice dish taste unique each day. Second, although having a schedule of food menus that repeat every week or two is convenient for the kitchen service and prison administrators, it is true that after a few years, it indeed could result in boredom and food fatigue. Hence many prisoners may welcome minor changes in the menus every week and even surprises. Finally, as noted by a few older prisoners, there should be an option to order food items either from online stores or from their family and friends to complement prison food so that they can address their own individual dietary needs. Prison administration should however be allowed to add necessary measures to ensure that this autonomy does not result in poorer health.

Another measure to improve nutritional intake involves more than simple changes. That is, customizing food menus based on the health needs of the prisoners such as diabetes and for those who are older. This is an important point raised by the older participants and one to critically consider since proper nutrition is critical for them remain as healthy as possible. As an older prisoner pointed out, these adaptations are already in place for religious and cultural groups (Collins & Thompson, 2012; Elger, 2016; Foster, 2006), and thus not considering the needs of those who are ill and old amounts to discrimination. Furthermore, because food can result in particular group alliances and power struggles amongst prisoners resulting in discrimination and imbalances in the prison structure (de Graaf & Kilty, 2016;

Godderis, 2006; Kjaer Minke, 2014), careful coordination and observations are necessary to avoid any harmful events.

A very few prisoner participants accepted that the generally poor nutritional standards were part of imprisonment. Imprisonment is the punishment for the crimes that prisoners have committed, but as humans, they retain their rights to their health and other needs (UN, 2015). Enabling healthy eating habits is a critical component of good health not only when incarcerated but also upon release. Prisons are public health intervention spaces and should be used to improve the health of not only older prisoners, but all prisoners.

Both older prisoners and stakeholders are positive about allowing prisoners to cook their meals occasionally. Depending on the health of older prisoners, their ability to cook, as well as their dietary needs, providing such opportunities more often might be a measure in the right direction. At the same time, we recognize the need to balance these freedom and security issues within the prison. Prison administration must seek to critically evaluate whether providing such greater freedom improves the overall health and well-being of older prisoners and those who are likely to die in prison. In line with this greater freedom, a good measure is enabling older prisoners to choose when and which exercise regimen to follow. Here also, simple adaptations such as giving prisoners the opportunity to move around in a greater space than just their cells and offering age-appropriate exercise regimens will improve their physical and mental health.

It is concerning that older prisoner participants report not being able to bite their food. Paying attention to their dental status is critical for allowing them the basic ability to consume food. Thus dental care should be made available as noted in the Mandela Rules: “The services of a qualified dentist shall be available to every prisoner” (UN, 2015). Also, lack of age-appropriate physical health options is the main reason older prisoners give for choosing to remain inactive. It is known that the health of older prisoners are disproportionately worse than younger prisoners (Fazel et al., 2001; T. Wangmo et al., 2015) and hence, age-appropriate interventions should be made a priority. Although the provision of security guards at these extra and longer periods may be a valid cost concern, it might be worth the long term benefit to the health of older prisoners, possible long-term cost effectiveness, and contributing to making the general prison environment responsive and caring.

Finally, only the participating stakeholders discuss making exercise programs mandatory. It is true that those who are motivated will find ways to remain active and those who lack motivation and give up easily will be more difficult to engage with and encourage. As prison provides a valuable public health environment to improve the health of prisoners

(Adams & Leath, 2002; Restum, 2005), making exercise programs mandatory might seem a valid utilitarian goal. However, caution is needed when “forcing” older prisoners to carry out regular physical activities. There may be ways to gently persuade older prisoners to take part in these programs by highlighting the benefits in an educational manner based on evidence<sup>1</sup> or through offering incentives. For instance, those who refuse vehemently should have the opportunity to witness the positive effect on those who decide to participate voluntarily.

### **Limitations**

As a qualitative study, the findings are not generalizable to all older prisoners or all countries. Although participants from more than one country took part in the study, the numbers are too few for broad conclusions to be drawn. Social desirability is another limitation associated with the methodology. However, since the focus of the overall project was not on nutrition and exercise, we believe that our participants did not exaggerate their responses. Related to this is the fact that as the project did not explicitly seek to understand the nutrition and exercise circumstances in prison, our data may not have covered all possible range of problems and solutions on this topic.

### **Conclusion**

As a group, the number of older prisoners is increasing worldwide making a case for age-appropriate nutritional and exercise interventions. There is an urgent need to adapt prison food to address the needs of ill and older persons. In addition, access to physical health opportunities should be made possible for older prisoners and they should have the option to carry out physical activities suitable to their health and abilities. Doing so will have positive economic outcomes for the correctional setting as it is known that good nutrition and exercise results in better health, older prisoners have greater disease burden than younger prisoners, and the cost of caring for them is greater than that of younger prisoners.

Those who study and work with prisoners and older prisoners in particular will agree that more research is needed to truly understand aging in the prison context and to address health, psychological, social, and political questions related to imprisonment and aging. Specifically on this topic of nutrition and exercise in prisons, research that evaluates healthy measures is needed. Follow-up research from our findings could include (a) examinations of whether enabling simple measures - food presentation, quality, and menu changes geared towards the health needs of the prisoners, and enabling them to supplement prison diet through personal resources - would result in greater food satisfaction and better overall health;

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<sup>1</sup> Whether incentives, such as those already discussed outside prison in the form of lower health insurance payments for sportive patients, are ethically acceptable is a debate that we will not discuss here.

(b) controlled studies to evaluate whether allowing prisoners to cook for themselves improves their physical and mental health; (c) research determining the effect of “greater” freedoms such as ability to move more freely on prisoners’ health and well-being; and (d) if age-appropriate exercise programs are to be implemented, measurement of their uptake by older prisoners, as well as the determination of which ones are most preferred and the reasons for such preferences.

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Table 1: Themes related to nutrition and exercise

<i>Participants</i>	<b>Themes</b>	<b>Sub-themes</b>
<i>Older prisoner participants</i>	Improving prison food is imperative	a. Food is catastrophic b. Available and needed possibilities for improving nutrition c. Barriers to nutrition
<i>Older prisoner Participants</i>	Challenges to exercise in prison	a. Bad conditions for exercise
<i>Stakeholder participants</i>	Implementing better uptake of healthy meals and physical activity	a. Prison as an opportunity b. Addressing nutritional needs and providing opportunities

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