

INVESTIGATIVE SURVEY ON THE SPORTS AND DIETARY HABITS OF THE INMATES OF THE SALERNO PRISON

INDAGINE CONOSCITIVA SULLE ABITUDINI SPORTIVI E ALIMENTARI DEI DETENUTI DEL CARCERE DI SALERNO

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ABSTRACT

The primary objective of this project is to redefine the concept of prison from being solely a place of punishment to a rehabilitative environment focused on training individuals who can contribute to society and are less likely to reoffend. As reported in the scientific background, few studies have investigated the nutritional status of the prison population, and no study has examined body composition, sleep quality, and cardio-metabolic diseases such as osteoporosis. Given the growing number of prisoners worldwide and the costs associated with their care, a particular emphasis on factors that could contribute to their health improvement through proper nutrition and increased physical activity levels.

Principale scopo di questo progetto è quello di migliorare il concetto di carcere dall'essere un luogo puramente di punizione a un ambiente riabilitativo incentrato sulla formazione di individui che possono contribuire alla società, con meno probabilità di recidivare. Come riportato del background scientifico, pochi studi hanno indagato lo stato nutrizionale nella popolazione carceraria e, nessuno studio, ha analizzato la composizione corporea, la qualità del sonno e le malattie cardio-metaboliche, come osteoporosi. Considerando il numero crescente di prigionieri nel mondo e i costi associati alla loro cura, un'enfasi particolare sui fattori che potrebbero contribuire al loro miglioramento della salute basata su una corretta alimentazione e sul miglioramento dei livelli di attività fisica.

KEYWORDS

Inglese Health,Body,Wellness,Diet,Sport
Italiano Salute,Corpo,Benessere,Dieta alimentare,Sport

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1 Lifestyle-Associated Pathologies in the Prison Population

Non-Communicable Diseases (NCDs) represent a global health issue given their rising prevalence, especially in terms of heart diseases, strokes, diabetes, cancer, and respiratory diseases. The four primary modifiable risk factors for these diseases are smoking, alcohol, physical inactivity, and unbalanced dietary regimes. In 2008, 36 million out of 57 million deaths worldwide were attributable to non-communicable diseases. Of these, 14 million were due to unbalanced diets, 3 million to insufficient physical activity, and 3 million to obesity (Herbert, 2012). Although NCDs affect people of all nationalities, ages, and classes, there are unequivocal disparities in the burden of these diseases between individuals in vulnerable situations (for example, in prisons or detention) and the general population (Herbert, 2012). Most of the 9.8 million people detained worldwide come from the poorest and most marginalized strata of society and are thus likely at a higher risk of developing NCDs (Herbert, 2012). Contact with the criminal justice system should represent a public health opportunity to promote improvement of these clinical conditions in this population at high risk of developing NCDs. Specifically, the prison regime represents an important place in reducing an individual's exposure to NCD risk factors given the social context in which inmates must coexist for several years. Prisons, therefore, have the responsibility to create a healthy environment and engage in promoting individual health. Although the prevalence of tobacco and alcohol consumption by inmates has been assessed, few pieces of evidence have evaluated dietary habits and implemented nutritional interventions to modify the main risk factors for NCD diseases, such as diet and physical activity.

Katharine H. (Herbert, 2012) and colleagues conducted a systematic literature review which suggests that the main modifiable risk factors for NCDs are a public health issue for detainees, showing persistent health disparities between the general population and inmates and thus strengthening the call towards the Health System to address these NCD risk factors in those living in a prison regime. Particularly, Katharine H. (Herbert, 2012)'s report shows how female inmates are more likely to be overweight and obese compared to the general population of similar age and sex. In this context, the difference in dietary habits might somehow explain these differences as it has been reported that female inmates are simply provided the same diet designed for male inmates, characterized by a higher caloric and energy content and this inevitably leads to weight gain (Herbert, 2012). The findings of this analysis also highlighted that the composition of the inmates' diet is responsible for the increased risk of NCDs. Indeed, diets in prisons are high in

refined carbohydrates and saturated fats and very poor in fiber, vitamins, and minerals due to the scarcity of fruits and vegetables (Herbert, 2012). The problem of these unhealthy dietary regimes could be further exacerbated by the fact that inmates can purchase extra snacks, which tend to be high in energy density, rich in salt, which leads to the depletion of vitamin and mineral reserves, aggravating the nutritional picture and predisposing these subjects to cardiovascular, metabolic, and oncological diseases with significant repercussions on health expenditure. Regarding data on physical activity, only very few pieces of evidence are available that show how inmates are less likely to reach the recommended levels of physical activity according to the guidelines compared to the general population (Battaglia, 2015; Hinojosa-Alcalde, 2021; Herbert, 2012).

For the data on obesity in the prison population, to date, these data are certainly underestimated as it has been shown that the BMI (ratio between weight and height) reported in the clinical record in prisons is often self-reported by the patient and not often measured by the Doctor, therefore, often underestimated especially in individuals with higher BMI who tend to not remember precisely their weight and their height and refer to the last weight measured which often also refers to several years before (Herbert, 2012). This leads to an important gap in the scientific literature on the estimation of overweight and obesity in the prison regime. Similarly, also the data on physical activity are often self-reported and, therefore, are intrinsically biased. However, given the difficulty in objectively recording physical activity, self-report data are widely used in most population studies. Therefore, it is necessary to design studies based on questionnaires on physical activity validated by international studies (Herbert, 2012). Of interest, even the studies that have evaluated the diet in the prison regime have numerous biases (Stanikowski, 2020; Davison, 2019). Indeed, in these studies the most common method of analysis was the evaluation of the menu, which provided dietary values for inmates as a group rather than as individual subjects. These studies are also intrinsically biased because they evaluated nutrient intake but not the actual intake of the meal. To date, no study has evaluated a higher incidence in the development of overweight and obesity in the prison regime and whether these conditions are associated with changes in lifestyles that occur in inmates and can be somehow contained thanks to programs carried out by a specialist in Food Science. Of interest, there are no studies in the literature that, beyond overweight and obesity, have evaluated the other components of body composition, such as bone health, therefore osteoporosis, and the musculoskeletal system, therefore the predisposition to the development of sarcopenia in the prison population.

2 Cardiovascular Diseases in the Prison Population

Several studies have clearly reported how incarceration leads to disparities in the incidence of various diseases, particularly an increased risk of cardiovascular diseases (Sanchez-Lastra, 2022; Arries, 2013). Indeed, detention seems to be associated with stress, hypertension, and other factors related to the pathogenesis of cardiovascular diseases. Among the risk factors responsible for this increased risk, lifestyle, and in particular physical activity and diet, play a fundamental role. Scientific evidence has clearly shown that physical inactivity has a greater incidence in detainees compared to the general population (Sanchez-Lastra, 2022; Arries, 2013). It is now clearly established in the scientific literature that high levels of physical activity are associated with a lower number of cardiovascular events, although the mechanisms underlying this inverse association are not yet entirely clear (Mora, 2007; Iestra, 2005). Furthermore, physical training is a powerful stimulus that could control and reduce primary and secondary cardiovascular events (Tinken, 2010; Dibben, 2021). Indeed, most cardiovascular diseases can be prevented (and treated) by addressing behavioral risk factors such as inadequate diet, sedentary lifestyle, smoking habits, and excessive consumption of alcoholic beverages.

Lifestyles, particularly exercise and diet, help prevent and are essential in the treatment of primary and secondary cardiovascular events. However, data on dietary habits and the influence of physical activity on the well-being of the prison population are scarce. More recently, Wang and colleagues (Wang, 2017) examined the cardiovascular health status in the prison population and reported that general risk factors specific to the prison regime, such as exposure to the prison environment, an incorrect diet, or lack of exercise, increase the risk of cardiovascular diseases, predisposing individuals to the development of overweight and obesity. Interestingly, Condon and colleagues (Condon, 2007) showed that even when subjects in a prison regime could exercise and improve their dietary regimes, they did not necessarily opt for them, probably due to the lack of qualified personnel, such as a Specialist in Food Science who instructed, in a simple way, patients to correctly follow a healthy lifestyle.

3 The Role of Nutrition in the Prison Population

A balanced diet and adequate physical exercise are fundamental components for maintaining a healthy lifestyle and preventing the increase in rates of chronic non-communicable diseases, particularly overweight, obesity, and cardio-metabolic diseases. As previously reported, cardiovascular diseases continue to be the leading causes of mortality in both the general and prison populations, more worryingly in the latter (Donahue, 2014). Despite this knowledge, choices that promote cardio-metabolic health based on lifestyle changes in the prison population are very scarce, fundamentally due to the lack of a Food Science Specialist to implement food promotion programs among detainees. Moreover, while there are health programs based on lifestyle modifications (diet and physical activity) in the general population, these programs are completely absent in the prison population. This is concerning in light of the growing number of detainees and the incidence of cardio-metabolic diseases, as well as the medical expenses for treating these diseases in the prison population.

In the prison context, with an increasing burden of cardio-metabolic diseases, ensuring a balanced diet and proper exercise would be feasible, very low-cost preventive measures to enable detainees to maintain or achieve good physical, clinical, and psychological health, considering the benefits of a correct diet also on mental health and sleep disorders, which, as we have previously reported, represent not only a social problem but also, and above all, a cardiovascular one (Bremner, 2020; Hosker, 2019). A meta-analysis has reported that inmates are more likely to be obese and have greater difficulty in following a healthy diet compared to the general population (Herbert, 2012). An examination of meals provided to inmates in England reported that, although they had access to a nutritionally balanced diet, it was not always healthy from the standpoint of food quality (Edwards, 2007). Other studies investigating collective catering services in prisons have reported that it was not possible to meet special dietary needs (diabetes, dyslipidemias, etc.) both for budget problems and, above all, for the lack of qualified personnel (Specialist in Food Science) capable of drawing up balanced and low-cost dietary plans (Elger, 2016; Collins, 2012). A Danish study highlighted the advantages of allowing inmates to prepare their own meals and choose what to eat (Minke, 2014). It is also interesting to note that a Dutch study reported a reduction in antisocial behavior among inmates who received food supplements, probably due to a correct integration of electrolytes, minerals, and vitamins that were evidently poorly supplied with the diet given the reduced intake of fruits and vegetables that represent the main source of micronutrients (Zaalberg, 2010). Plugge and colleagues reported that inadequate nutrition and lack of exercise put inmates at serious risk of developing cardiovascular diseases, leading to an increase

in healthcare costs that could be easily avoided through proper nutrition and personalized exercise programs (Plugge, 2009).

It should also be emphasized that the results of the available scientific literature indicate the fundamental role played by proper nutrition in improving the cardio-metabolic health of detainees and in reducing their aggressive behaviors (Elger, 2016; Zaalberg, 2010; Plugge, 2009), providing a valid reason to include a Food Science Specialist in the prison staff to improve the quality of the diet. This could include simple and low-cost measures. First, food could be provided as an appetizing menu, and monotonous menus could be avoided. For example, this could be done by ensuring that rice or pasta are not provided every day of the week (as a high glycemic index carbohydrate load is associated with overweight and cardio-metabolic diseases), but could be replaced by other cereals, such as spelt and/or barley, cheaper but better from a nutritional point of view. Second, even with a menu program that repeats every one or two weeks, after a few months, these cause boredom and dietary monotony. Therefore, many inmates may welcome even small changes in the menu every week and also surprise meals. Finally, as noted by some older inmates, there should be an option to order food products from online stores or from their families and friends to supplement the food in prison so that they can meet their individual dietary needs.

4 The Role of Physical Activity in the Prison Population

Inmates present a higher burden of cardio-metabolic diseases compared to the general population with a higher risk of developing chronic diseases related to poor physical activity and inadequate nutrition. Physical activity plays an important role as a protective factor against chronic non-communicable diseases in the prison population and should be considered in all incarcerated populations to improve health conditions at no cost. Several scientific evidences have reported the beneficial role of physical activity through personalized programs prescribed by qualified personnel on the cardio-metabolic health of individuals in prison (Battaglia, 2015; Williams, 2012; Fazel, 2011).

In 2014, Battaglia and colleagues (Battaglia, 2015) estimated which type of physical activity could improve the health status and fitness levels of inmates. They measured the effectiveness of a nine-month physical activity intervention program on the psychological well-being of 64 inmates. Participants were included and randomly assigned to three groups: endurance training, high-intensity strength training, and no exercise. The authors demonstrated that any form of exercise

(endurance or strength training) significantly reduced depression scale scores compared to the control group, where average depression scale scores increased. The study concluded that the physical activity program effectively improved the mood, anxiety of the inmates, and overall mental health (Battaglia, 2015). In a pilot study published in 2015, Mannocci and colleagues (Mannocci, 2018) evaluated in a multicenter cross-sectional study the association between physical activity and quality of life among Italian inmates. The authors found a positive association between quality of life and the level of physical activity. Furthermore, they demonstrated that years of detention and age were important aspects of the overall assessment of quality of life. The time dedicated to physical exercise was indeed positively correlated with the subject's age and the years spent in prison. Inmates with long-term sentences and older people felt more the need to organize activities and had interests to improve the way they spend their time and achieve better life satisfaction (Mannocci, 2018). In 2016, a dual case study by Amtmann and Kukay (Amtmann, 2016) examined the effects of fitness coaching on two minors in a juvenile detention facility in southwest Montana. After the eight-week program, both participants made improvements to fitness and both perceived positive effects on self-concept and overall well-being from participation in this program (Amtmann, 2016). More recently, Bueno-Antequera and colleagues (Bueno-Antequera, 2019) assessed the effects of a 12-week intervention combining aerobic and strength exercises of moderate to high intensity in 41 inmates with a psychiatric disorder. The authors reported that the physical exercise program led to substantial benefits in terms of cardiorespiratory fitness, upper body strength, and anthropometric measures (Bueno-Antequera, 2019). In 2018, Mohan and colleagues (Mohan, 2018) in a systematic review, examined interventions aimed at improving cardiovascular health factors or behaviors among inmates during imprisonment. They concluded that supervised physical activity improved determinants such as blood pressure and cardiovascular problems and modified health factors and behaviors of cardiovascular health of prisoners during incarceration (Mohan, 2018). In 2019, Sanchez-Lastra in a systematic review analyzed the effectiveness of training programs performed by inmates, demonstrating that exercise programs in prison constitute a feasible and useful strategy to improve the physical and mental health status of inmates (Sanchez-Lastra, 2013). In light of reduced depression scores, Battaglia and colleagues (Battaglia, 2015) conclude that just one hour of moderate physical activity a week for inmates is enough to improve mental health. Similarly, other studies have reported the importance of physical activity for social integration in prison, highlighting how low-cost programs can have fundamental importance in the

prison population (Mannocci, 2015). Finally, a recent systematic review of the scientific literature, Papa V. et al discussed the general health conditions and cardiovascular risk profile in inmates compared to the general population and evaluated whether physical exercise could be a useful tool for preventing these diseases in inmates (Papa, 2021). Nine studies evaluated health conditions in inmates, five studies evaluated the incidence of cardiovascular diseases and coronary diseases in the prison population, and 10 studies evaluated the feasibility and effectiveness of exercise programs in inmates. Sports education programs can benefit inmates. It appears that training with exercise supervised by qualified personnel is the most effective strategy for dealing with incarceration. Moreover, it appears that sports programs can be a useful tool to improve the physical and mental health of inmates as well as to reduce cardiovascular risk factors. Despite the recognized beneficial effects of physical activity on cardio-metabolic health, little is still done in the prison population to encourage them to more active behaviors in order to improve the quality of life in prisons and reduce the development of chronic non-communicable diseases related to incorrect lifestyles. In this context, the Specialist in Food Science would represent the professional clinical figure that can improve these components leading to the reduction of health care spending related to the costs for the pharmacological therapy of cardio-metabolic diseases.

In this sense, the current international scientific debate on motor praxeology has initiated an interdisciplinary and multidisciplinary reflection on physical education on an international scale, highlighting the serious identity crisis accompanied by great confusion at the level of intervention practices. In short, physical education must face two types of difficulties:

- Theoretical difficulties: referable to the definition of a specific theoretical framework even though in the name of interdisciplinarity.
- Practical difficulties: referable to the modalities of organization and teaching of curricular and extracurricular activities of physical education.

According to Lavega, the study of motor behaviors could direct schools to an attention to the motor manifestations, observable and not, carried out by the students, offering an interesting individual and collective insight into the potential for educability of physical education from the perspective of the ecology of the person.

This invitation from different scientific fields has introduced in the international scientific panorama a new reading of motor actions in a biopsychosocial key

referring to the analysis of motor behaviors. Every motor activity, whether it is playful and/or motor, must be read as a comprehensive system where the components, logically ordered, are the manifestation of fundamental acts/movements combined by the interconnection of anatomical-physiological cognitive historical social conditions materialize and express themselves through a praxiological motor repertoire functional to the value transmission of culture in a playful-social key. The starting point of praxeology is not a choice of axioms and a decision on methods of procedure, but reflection on the essence of action. It goes without saying that according to Parlebas (2016) the surrounding context plays a determining role in the knowledge of the overall structure, the types of interactions, the essential characteristics, the decision processes, underlying a motor conduct whose components vary interactively it follows that if every motor action is an adaptation of motor behaviors a possible study and analysis could open interesting educational reflections from the point of view of interpreting the relationship between nutrition and movement, suggesting the diffusion of a new socio-cultural field of investigation that interprets every motor behavior as the result of objective and observable manifestations of movement and the subjective meaning associated with it, consequently motor behaviors are the manifestation of motor experience defined by the interdependence of five dimensions of personality: cognitive, socio-relational, biological, expressive, and affective.

In particular, the reference to the praxeological approach could be functional to a longitudinal study on the relationship, motor activities nutrition, and prison detention. Integrating physical activity into the social rehabilitation curriculum of inmates could promote a more holistic and integrated educational approach, focusing attention on the integration of cognitive, physical, and socio-emotional aspects to promote the overall development of students for the well-being of all (Anderson, 2018; Sallis, 1991). Therefore, it is necessary to approach the interest in corporeality as a socio-rehabilitative and educational modality that involves the different levels that are also significant in the affective, cognitive, and social fields.

Psychomotor education could in this sense "represent" a psycho-pedagogical intervention that stimulates through motor skills to control one's own experiences, to know oneself and the surrounding environment, to learn cognitive and relational modalities that are increasingly adaptive..." (Pavese, 2009). It goes without saying that a "diagnosis" of the strengths and weaknesses of each child (even the one who shows a disability) is necessary.

- The revelation of all the factors that make up the overall situation;

- The translation of the observed observations into an intervention project.

A possible laboratory approach with a psychomotor character therefore represents "... the art of teaching in a learning environment intended for experimentation in the scientific field, in which the subject of the intervention has an active role [...] It addresses students with disabilities with an orientation aimed at recovery and, above all, at strengthening residual motor skills, contributing, with appropriate activities, to the balance of the psychic life of the person in a logic of dynamic-functional design..." (Sibilio, 2004).

Conclusions

The originality of Parlebas' vision (2003) lies in the focus on the motor biography of each individual, a parameter for the localization and selection of motor practices within a catalog of motor behaviors to be adapted to psychomotor and socio-motor situations. In this sense, the integrated reading of motor behaviors paves the way for a revisitation of the ways in which the body in motion is used in a socio-rehabilitative key. This means that psychomotor activities can help inmates. Starting from their own bodies, leveraging the socio-vicarious potential of movement activities, this study will contribute to providing significant results for the design and adaptation of lifestyle programs (nutrition and physical activity) for inmates. Unfortunately, to date, the health care and well-being of inmates are not a priority for governments worldwide, particularly the absence of programs promoting physical activity and healthy eating among inmates. The role of a Food Science Specialist who promotes programs of healthy eating and physical activity could be an effective public health strategy capable of improving the health status of the prison population, decreasing the risk of overweight, obesity, metabolic diseases, and cardiovascular events associated with lifestyle, leading to an increase in clinical, physical, and also psychological well-being in inmates, thus providing substantial long-term financial benefits for the national health system. Moreover, while there are health programs based on lifestyle modifications (poor dietary choices and physical inactivity) in the general population, these programs are absent in the prison population. This study could lead to a broader interpretation of motor activities as a source of socio-rehabilitative well-being in both medical and socio-educational inclusive terms.

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