

## ORIGINAL RESEARCH PAPER

# THE OCCURRENCE OF OVERLOAD CHANGES AFFECTING PRISONERS PERFORMING STRENGTH TRAINING

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## Abstract

*Aim: Without taking into consideration the pedagogical justification for doing the strength training by prisoners, the authors of this study discuss the problem of the consequences of allowing prisoners to do the strength training freely. The study was conducted to determine the frequency and the location of the overload changes in the musculoskeletal system of prisoners who do the strength training as well as the presumable reasons for such changes. Methods: The study was conducted with the use of an interview technique among 44 men, repeat offenders serving a sentence of imprisonment in a prison in Inowrocław, regularly engaged in strength training in their free time. Results: The respondents trained quite often (more than 5 times a week), slightly more than a half of them started the training with the warm up, and 64% did not do any stretching exercises after the training. The overload changes associated with strength training affected 30% of the respondents. Conclusion: The high level of injury among prisoners who do the strength training is due to: too many sessions a week, the lack of warm up and stretching exercises, as well as the insufficient level of knowledge on the prevention from sports injuries.*

**Key words:** *prison, prisoners, strength training, warm up, relaxation, overload changes.*

## **Introduction**

A compulsory isolation in prison is often associated with sudden and serious changes in biological and psychosocial aspects of a human life style (Goffman, 2011; Machel, 2003). In countries with humanitarian and correction oriented penitentiary systems, imprisonment can be seen as an opportunity to improve particular health indicators of selected social groups (Niewiadomska, 2007; Poklek, 2010).

Unfortunately, prison isolation is the source of many health risks inevitably resulting in a number of adverse changes in all areas of prisoners' health (Fazel, Baillaregon, 2010). The decreased level of physical activity may be a risk factor for the majority of such changes. It seems that hypokinetic reasons for health risks are of particular interest to researchers of Polish penitentiary system, which – in contrast to the West European systems – is characterised by a relatively low minimum standard of living space per person and high overpopulation (Machel, 2008; Council of Europe, 2013a, 2013b).

According to the standards introduced by the Council of Europe, the enforcement of custodial sentences requires the opportunity for all prisoners to do physical exercises daily (Council of Europe, 2006). Skillful use of sport in provoking changes interactions can bring many benefits ultimately resulting in a positive change of prisoners' behavior and their better adaptation to social life (Meek 2014). However, there is lot of controversy in taking up strength training by prisoners (Poklek, 2008; Todd, 1995). The previous studies among Polish penitentiary personnel show i. e. a lot of concern that during the physical and sports training, prisoners acquire skills and abilities which can be used by them in their later criminal activity (Łapiński, 2007).

However, as penitentiary practice shows, in situations of a severe deprivation of prisoners' need for physical activity, and with insufficient range of motor activities offered by prison administration, prisoners – in spite of the bans – surreptitiously do some physical exercises in their cells (Rejzner, 2002). Instead of the training equipment, they frequently use pieces of furniture (such as stools, cupboards or beds) and self-made weights e.g. interconnected plastic bottles filled with water.

Because of ambiguous rules of doing strength training in Polish prisons, particular prisons implement different solutions. In some prisons with gyms, they organise training with an instructor, or provide prisoners with the equipment and space to train without special supervision over the

safety and the selection of exercise loads. In this article, the authors consider the problem of the consequences of allowing prisoners to do independent and unfettered strength training connected only with the area of physical health. However, they do not focus on pedagogical merits of practicing strength training by prisoners. The study was conducted to determine the frequency and the location of overload changes in the musculoskeletal system affecting prisoners taking up strength training and the most probable reasons for such changes.

### **Material and Methods**

The study was conducted among male inmates in prison in Inowrocław. The participation in the survey was offered to all prisoners who regularly practise strength training in their free time. A deliberately chosen group of participants composed of 44 men – recidivists whose average age was 33 years and 2 months. The men did not participate in organised bodybuilding activities conducted by a qualified instructor but were allowed to use the gym every day. The participants have undertaken strength training for 6 years and 6 months at an average frequency of 5.3 workouts per week.

The research was conducted with an interview technique using a questionnaire of the authors' own design. Both the research technique (which gives the possibility of detailed questions) and thanks to the physiotherapeutic qualifications of the interviewers it was possible to identify (and reflect in the statistics) only those overload changes (including overload injuries and the overuse syndrome) which were associated with the strength training. In the case of the overuse syndrome, particular phases and periods of remission were recognised separately in the statistics.

### **Results**

The overload changes connected to strength training were recorded among 13 respondents who constituted 29.5% of the respondents. Selected information regarding training performed by these people and injuries suffered by them are included in Table 1.

**Table 1**

Data on strength training performed by individuals who have suffered overload changes and other data referring to these changes (statement by number of changes observed)

No	Performing weight training		Performing a warm-up		Performing stretching exercises		Occurrence of overload changes	
	Period of training [years]	No of trainings per week	frequency	Timing [min.]	frequency	timing [min.]	Number	Body parts
1	20	6	seldom	15	never	0	15	spine, shoulder girdle, elbow joint
2	15	7	never	0	never	0	6	spine, biceps of thigh, biceps of arm
3	4	7	always	30	never	0	5	spine, elbow joint, knee joint
4	24	5	not always	5	yes	2	3	ankle joint , biceps of thigh, knee joint
5	1	7	always	5	never	0	3	spine
6	20	7	always	20	yes	15	3	elbow joint, knee joint, ankle joint
7	8	7	not always	15	not always	15	3	shoulder girdle, fingers, knee joint
8	20	5	always	25	yes	10	2	spine, elbow joint
9	2,5	6	never	0	never	0	2	shoulder girdle
10	7	6	always	10	yes	5	1	shoulder girdle
11	2	6	not always	40	never	0	1	shoulder girdle
12	20	7	not always	15	never	30	1	shoulder girdle
13	1	4	always	15	never	0	1	elbow joint

With reference to the respondents described in Table 1, the overuse syndrome most commonly occurs in the area of a shoulder girdle (25%), an elbow joint (18%), a spine (18%) and a knee joint (14%). 11% of the respondents experienced overload changes in an ankle and 7% of them experienced overload changes in the femoral biceps. The least changes were recorded near fingers (3%) and the arm biceps (3%).

Respondents who suffer from overload changes; have performed strength training significantly more often than the ones with no such changes recorded (Tab. 2).

**Table 2**

The frequency of training performed by people who have and have not suffered from any overload changes

Occurrence of overload changes	No of trainings per week		U	Z	p
	M	SD			
Participants with overload changes recorded	6,1539	0,9871	94,000	-2,7653	0,006
Participants with no overload changes recorded	4,6129	1,8381			

The intention of the researchers was to assess the performance of particular phases of training sessions which significantly determine the risk of overload changes, especially a warm up prior to strength training and stretching exercises ending training sessions.

It was reported that only 54.5% of the respondents always perform a warm up and 23% of them often perform it, but not always. 18% of the respondents never perform a warm up and 4.5% of them do it rarely. Among those respondents who always perform a warm-up, 75% have never experienced overload changes and 25% are the respondents who suffered from such changes.

Stretching exercises after strength training are never performed by as many as 64% of the respondents. Such exercises are always performed by 31.5% of the respondents and 4.5% of the respondents often take stretching exercises, but not always. Among those who always perform stretching exercises, 71.5% are people who do not suffer from any overload changes and 28.5% of them are people who suffer from such lesions.

The duration of the warm-up was between 5 and 40 minutes, 16 minutes on the average. The duration of stretching exercises was between 2 and 45 minutes, 13 minutes on the average.

Respondents were also asked to make a self-assessment about the level of knowledge concerning strength training (by admitting certain number of points between 1 and 10, where 1 point meant a complete lack of knowledge and understanding and 10 points meant the maximum knowledge). The average level of knowledge was estimated at 6.11 points.

Further analysis was only performed with data relating to people who had been reported to suffer from overload changes (Tab. 1). As much as 77% of respondents believe that overload changes endured by them can have been avoided. The rest of the respondents suffering from such changes stated that the changes had been rather impossible to be avoided.

While being asked about the likely causes of the overload changes, the respondents most frequently pointed to the wrong exercise technique (62%) and the excessive training loads (54%). Among the reasons for the overload changes the respondents also pointed to: the lack of the warm-up (23%), inappropriate performance of the warm-up (15%) and the lack of assistance while doing exercises (7%). None of the respondents indicated the failure of stretching exercises as the cause of the overload changes.

62% of the respondents, who suffered from the overload changes, applied a self-healing treatment using a warming ointment. Other methods of treatment have not been used. Almost all respondents (except one person) who suffered from the overload changes were forced to break the cycle of training. This break lasted for an average period of 65 days.

Only 15% of the respondents suffering from the overload changes declare that currently they can perform training in the same way as before. Due to some post-traumatic experience, 70% of the respondents are forced to train less frequently or use a reduced load while training.

## Discussion

In accordance with legal regulations the first task (which can be interpreted as the most important) of the Polish Prison Service is *"conducting penitentiary and rehabilitation to persons sentenced to imprisonment, mainly by organising their work in the way to promote the acquisition of professional qualifications, cultural and educational activities, activities in the field of physical culture and sport, and specialised therapeutic programmes"* (The Act of April 9, 2010 on the prison service). Consequently, prison personnel are responsible for preparing inmates for social life complying with the legal and moral standards after regaining freedom. At this point, it should be stressed that health is very important to live in a society. Health as perceived complementarily is an important means of implementing life plans (Kuński, 2000) and one of personal resources, determining a positive rehabilitation of prisoners (Kalinowski et al., 2010). For this reason, imprisonment should be executed in a way to allow inmates to preserve health, especially to minimise the negative impact of prison isolation on health. This postulate applies to various determinants of prisoners' health, including their participation in physical culture. The standard for daily physical activity of prisoners, delineated by the European Prison Rules should be – according to the authors – applied in pro-health activity to minimise the negative effects of isolation. This means that it is unjustified to leave the prisoners a complete freedom in the choice of exercises and loads, especially in those types of activities which are relatively easy to become anti-health ones. Strength training is such a kind

of activity. It seems that prisoners are a social group particularly vulnerable to negative effects of strength training for two reasons. Firstly, due to a difficult access to reliable knowledge about training in prisons especially taking into consideration places where training do not have organised form. Secondly, due to other than health reasons for which prisoners undertake strength training, i. e. fast muscle growth at all costs increasing the sense of security and giving a higher status in the informal social structures, as „Appearance and physical strength contribute to gaining a specific position by a prisoner in the hierarchy of a group” (Szaszkiewicz, 127). In such circumstances, amateurs frequently use excessive loads intended for professionals. This situation is contrary to international standards, because prisoners’ health potential is lowered, and thereby their ability to adapt to life at large is reduced.

### Conclusions

As far as prisoners are concerned, the reasons for overload changes related to strength training include:

- refraining from performing a warm up and stretching exercises
- incompetent dosage of loads including too many training sessions a week
- limited access to reliable knowledge about the safety of strength training

It is necessary to make a multifaceted educational intervention in the form of a health education programme aiming at:

- changing the place of health in prisoners’ axiomatic system by assigning a higher value to health
- raising prisoners’ awareness of the relations between their personal health potential in all areas of health and the opportunities to implement prisoners’ life plans including their full involvement (after imprisonment) in social life without the danger of re-offending and imprisonment
- raising prisoners’ health awareness in the areas of:
  - determining the place of strength training among other types of physical activity in training plans aimed at fostering health;
  - theoretical and methodological foundations of strength training – with special focus on the specific health risks for prisoners.

Such intervention should be supplemented by:

- actions aimed at increasing prisoners’ access to literature on health training for adults through the purchase of appropriate books to a prison libraries;
- appointing a person with instructor’s competences from among pedagogical personnel to supervise the prison gym or gaining such competences by a designated penitentiary tutor.

Additional analysis should be done in the field of health implications of strength training of prisoners who are free to decide on the frequency and the course of such training (choosing training programs, the loads and technique of training applied), and supplement it with a proper medical examination and expand the area of diagnosis (e.g. by selected cardiological indicators). In the case of people who exercise frequently, it is also worth to make a diagnosis on the addiction to physical activity.

In addition, to meet the international standards concerning physical activity of prisoners (regarding the relationship between the high frequency of training and the presence of overload changes), some changes should be introduced in the functioning of prison gyms aimed at promoting the access to them, including less fit and senior prisoners. At the same time, people who start strength training with heavy loads (especially the ones who do not take up any other physical activity) should be encouraged to participate in health-related programs, in which strength training would be a reasonable part of other types of health training.

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