

## Prisoners in Karachi – A Health and Nutritional Perspective

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### Abstract

**Objective:** The aim of this study was to assess the health and nutritional status of prisoners in Karachi, Pakistan.

**Methods:** This cross sectional study was conducted from September 2012 to February 2013. Convenient sampling technique was used. A sample of 433 prisoners was taken from Karachi prison. Selected inmates were interviewed using a structured questionnaire. Prisoners were assessed with measurements of height, weight, body mass index (BMI) status, Blood pressure, Random Blood Sugar levels, dietary pattern, occupational status, source of food, duration of exercise, history of diseases and addictions were recorded.

**Results:** Age of the prisoners varied between 18-65 years. Among 433 prisoners, 39.7% were under weight and 8.3% were malnourished. Exercise was not reported in 80% of prisoners. It was noted that 11.8% prisoners were having respiratory tract infections at time the study was conducted. Among 433 inmates, 386 were addicted to at least one addiction such as smoking, naswar, pan, gutka and manpuri, heroin, ganja (cannabis), charas (hashish form of cannabis), and opium.

**Conclusions:** This study showed that the diet of the prisoners was insufficient and nutritionally imbalanced and has led to malnourished and underweight prisoners. Substance abuse is common among inmates.

**Keywords:** BMI, prisoners, nutrition, diseases, diet

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### Introduction

Prisons have been constructed since old times to accommodate diverse types of people who have been judged to have committed crimes. The world prison population has increased up to 9.25 million<sup>1</sup>. An institution like prison is required not only to punish the offenders but also to rehabilitate them and provide good quality health care facilities which oth-

erwise would be inaccessible for the prisoners<sup>2,3</sup>. It is important to make a prisoner physically and mentally fit during his stay in prison so that he will become a useful person in society when he completes his sentence.

One of the important aspects in the lives of prisoners is food, which not only help them escape from a monotonous routine life pattern but has also been implicated in various studies to be associated with developmental disorders, aggression and anti-social behavior<sup>4</sup>. The association of antisocial and criminal behavior with dietary deficiency of single or multiple macro and micronutrients has been demonstrated in many studies<sup>5</sup>. The maintenance of nutritional adequacy becomes very important specially where there is restriction and rationing of food as seen in prisons, hospitals and homes for older

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people<sup>6</sup>. Prisoners are more susceptible to develop nutritional deficiencies especially micronutrients required for optimum health and prevention of chronic heart diseases and their complications<sup>7</sup>. Prisoners in developing countries are more prone to develop diseases due to dietary deficiencies<sup>8</sup>. Governments and institutions in developing countries usually ignore prisoners regarding their dietary and social requirements because of economic difficulties and also because prisoners are generally disliked and not considered to have any human rights. This results in prisoners access to health care and quality of life that is often deficient. On the other hand, prisoners in developed countries like in UK are given choice to select their meal prior to the day of consumption, from menu containing main meal components, plus any special dietary requirement.

Non communicable diseases like cancer, respiratory diseases are more common worldwide. Prisoners population constitute a high risk group representing poor and marginalized section of the society to develop communicable and non communicable diseases<sup>9</sup>. Four modifiable risk factors that have been identified for developing non communicable diseases are smoking, unhealthy diet, inadequate physical activity and alcohol consumption<sup>10</sup>. Out of these four, prevalence and exposure of tobacco and smoking are increased specially in prisons ranging from 64% to 98.1% around the world<sup>11</sup>.

Pakistan is a developing country. There is usually low priority, corruption and negligence in government institutions in fulfilling their responsibilities. Since prisoners are generally unprivileged and hated individuals, not considered for the equal human rights as with rest of the citizens, it is very important to know the health and nutritional status of prisoners beside their social and mental well being during their stay in prison. Taking care of these issues will be helpful in making prisoners useful citizen of the society when they are released. This study was conducted in Karachi to assess the health and nutritional status of these neglected individuals of society.

## Subjects and Methods

This cross sectional descriptive study was conducted during September 2012 to February 2013.

A total of 433 male prisoners aged 18-65 years were selected from Karachi prison by convenient sampling method and those prisoners who were present in the prison during the time of interview were considered. Using the formula for estimating population proportions with an anticipated prevalence of 50% and 95% confidence Interval, the sample size found to be 385, however a sample of 433 was taken in our study<sup>12</sup>.

All prisoners were interviewed after taking informed consent, using a pretested questionnaire to collect data regarding age, marital status, education, occupation, and nature of work, duration of exercise and source and composition of food. History of any acute or chronic illness, addiction and drug history were also recorded. Prisoners facing death sentence or whose duration was less than six months were excluded from the study.

Medical record and base line data regarding height and weight of the selected prisoners were obtained from prison authorities. At the time of interview each prisoner's height, weight and body mass index (BMI) were calculated using the formula  $\text{kg/m}^2$ . Blood sugar and blood pressure (BP) were recorded by glucometer and sphygmomanometer respectively. Data was analyzed using SPSS version 17.

## Results

Most of the prisoners (>68%) consumed food provided by prison authorities. Beside those prisoners who only eat food provided by the prison, there were more than (24%) prisoners who used both homemade and prison food in their meals. Details of source of food to prisoners are shown in the (Table 1).

In this study it was noted that malnourished prisoners increased from (7.4%) at the time of imprisonment to (8.3%) at the time of this study, similarly, underweight prisoners increased from (22.2%)

to (39.7%). Weight reduction was also noted among normal and obese prisoners. Comparing Body Mass Index of prisoners at the time of imprisonment and study, it is noted that among 433 under study prisoners, 160 (37%) prisoners showed reduction in their BMI. Body mass index of prisoners at the time of imprisonment and study is shown in (Table II). Replying to the question whether prisoners are satisfied with quality and quantity of food provided by prison authorities, only 9 (2%) prisoners showed their satisfaction over quantity of food provided to them where as only 2 prisoners were satisfied with quality of food.

Only 39 prisoners (9.00%) replied that that they regularly exercise and go to gym located within prison on regular basis where as 57 inmates (13.16%) exercise but not on regular basis. 46 prisoners (10.62%) were known diabetics and were getting medicines from prison. When random blood sugar test was conducted, only 17 (37%) prisoners among diagnosed diabetic prisoners were having blood sugar (BSR) levels within normal limits (BSR < 160 mg/100ml). Another 5 prisoners, who were not known to be diabetic and never screened, showed deranged BSR levels.

There were 87 (20%) prisoners who were known hypertensive (29 were having diabetes along with hypertension). When BP of these prisoners was checked, 81(18.7%) prisoners showed BP within normal range. Cough was the most common health complaint accounting for 91 (21%) prisoners. GIT complaints were present in 38 (8.77%) prisoners followed by 21 (4.85%) prisoners suffering from skin ailments.

Among 433 prisoners, there were only 47 (10.85%) prisoners who were not addicted to any substance. Among the prisoners 280 (64.67%) admitted that they were smokers. Naswar, pan, gutka and manpuri was used by 81 (18.71%). There was overlapping of different addiction by subjects. A smoker may have addicted to gutka or naswar or heroin. Other common addiction substance used by prisoners includes heroin, ganja (cannabis), charas

(hashish form of cannabis), and opium etc. Addiction by prisoners is shown in Fig.1.

## Discussion

This study showed that food provided by the prison authorities was the major dietary source for the majority of prisoners. Regarding the quality of food, majority of inmates complained of undercooked meals and uneven portions and that the food was not provided according to the jail menu. Provision of a healthy and balanced diet is important in institutions like prison<sup>7</sup>. In developing countries like Pakistan the inmates are more prone to develop dietary deficiencies and nutritional inadequacy<sup>13,14</sup>. One such study conducted in Pakistan has analyzed dietary scales for prisoner women and children and documented that the dietary scales were not nutritionally adequate<sup>15</sup>. Another study conducted in Beon prison, Papua New Guinea has documented vision loss among adult prisoners secondary to optic neuropathy that resulted due to inadequate intake of several essential nutrients to prisoners<sup>16</sup>. The limited rationing to the prisoners also makes them vulnerable to develop micronutrient deficiencies which are required in small quantities but affects the general health and performance of humans<sup>17</sup>. A cross sectional study conducted in 2012 in central prison of Mashad, Iran reported prevalence of selenium deficiency to be (9.7%) in a total sample of 435 prisoners<sup>18</sup>.

The diet of the prisoners is usually inadequate nutritionally and places them at higher risk of developing acute and chronic nutritional deficiency diseases. However some of the prisoners may benefit from additional food ration from their homes and visitors but the majority of prisoners remain nutritionally inadequate<sup>16</sup> in accordance also with the findings in our study.

In this study we found a considerable range of BMI, depicting malnourished, underweight, normal, overweight and obese inmates. However the number of prisoners in the underweight category increased significantly when compared with the number at the time of imprisonment which show low energy in-

takes by these prisoners. Similarly the total number of prisoners having normal BMI also reduced. Our findings regarding BMI is in accordance with the meta analysis of BMI data from worldwide prisoners population reviewed by Katherine and co- workers (2012) which showed that except in USA, BMI of male prisoners was less than in the normal population of similar age and sex and the rate was still higher in low income and middle class countries<sup>19</sup>.

Our study also analyzed the health status of these prisoners. Out of 433 prisoners 219 (50.7%) were not suffering from any communicable and non communicable diseases, however prevalence of respiratory disease was highest among inmates (21%), followed by hypertension (20%) and diabetes (10.62%). Non communicable diseases have emerged as health crises and are increasing globally<sup>20</sup>. The transmission of respiratory diseases is more likely to spread in overcrowded and confined place like prison<sup>22</sup>. A study conducted in prisons of Khyber Pukhtunkhwa province, Pakistan has also identified many contributing factors in the transmission of mycobacterium tuberculosis like overcrowding, lack of early diagnosis and treatment, which may occur in a setting such as a prison to inmates exposed to an individual with tuberculosis who is not diagnosed, but remains a source of infection to others<sup>21</sup>. Though we have not looked at tuberculosis in our study, but a strong possibility of this exists in prison inmates.

Results of this study have also highlighted the high prevalence of hypertension among inmates (20%) which is one of the main independent risk factor for cardiovascular diseases. Our findings are in line with a previous cross sectional study conducted in Peshawar, Pakistan which identified frequency of risk factors for cardiovascular diseases among prisoners and documented that hypertension was present in considerable numbers of prisoners<sup>22</sup>.

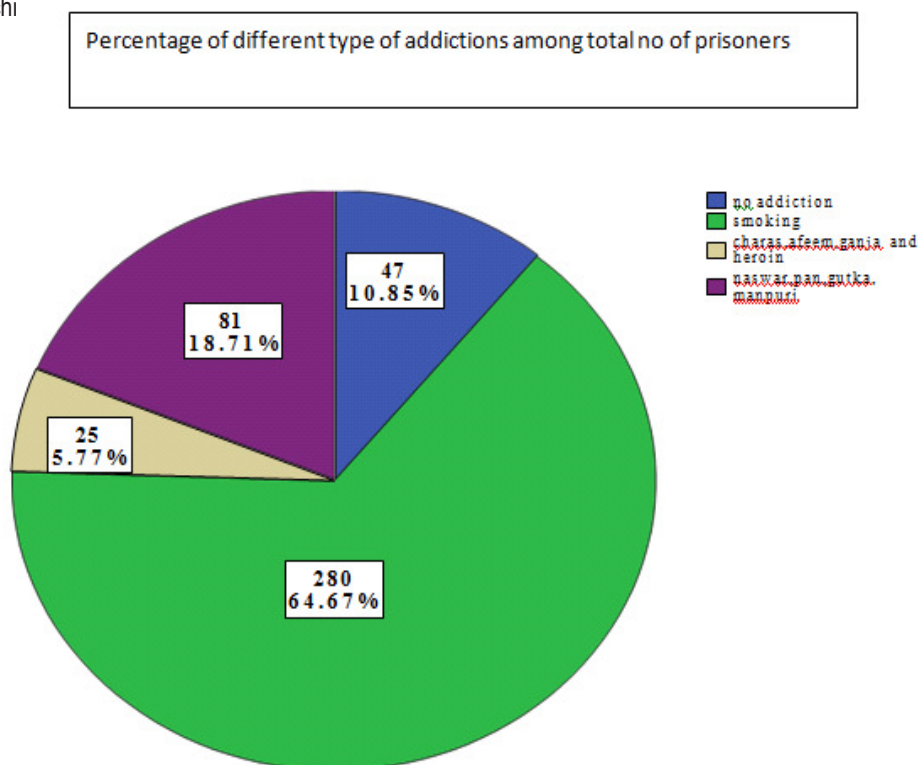
Drug addiction has increased significantly in prison population throughout the world and it is more common in adult male prisoners compared to general population<sup>23</sup>. Our study also identified that tobacco smoking was highly prevalent among inmates (64.67%) followed by naswar, gutka and charas, ganja and opium. Prisoners using parenteral drugs are also at high risk of developing infectious diseases like HIV, hepatitis B and C<sup>24</sup>. High prevalence of tobacco smoking among prisoners is attributed due to the difference in psychosocial, educational background and health status of the prisoners than in the general population<sup>25</sup>. Similar results showing the high prevalence of smoking among prisoners were reported between 64% - 91% in American, Europe and Australian prisons<sup>26</sup>.

The limitation of study is that it reflects point prevalence. Although prisoners who were in jail for less than six months were not included in the study but study does not differentiate prisoners with

**Table 1.** Details of source of food consumed by prisoners in Karachi and their Body Mass Index (BMI).

Food Consumed by Prisoners			BMI of Prisoners		
Source of food	Frequency	Percent	BMI (Standard values)	BMI at the time of imprisonment n (%)	BMI at the time of interview n (%)
Home made	33	7.6	< 18(malnourished)	32 (7.4)	36 (8.3)
From Jail	295	68.1	18-20 (underweight)	96 (22.2)	172(39.7)
Jail + home	105	24.3	20.1- 25 (normal)	237 (54.7)	198 (45.7)
Total	433	100.0	25.1 – 30 (overweight)	61 (14.1)	22 (5.1)
			> 30 (obese)	7 (1.6)	5 (1.2)

Fig. I : Addiction among prisoners in Karachi



longer duration of stay with prisoners of shorter duration of stay. Hence, duration of stay in prison under adverse circumstances may affect the weight of prisoners and thus their BMI.

This study was carried out in Karachi among male prisoners only; there is a need to expand a similar study among female and juvenile prisoners in Karachi and in other prisons located in different cities of Pakistan.

It is recommended that health and nutrition of prisoners should be considered by the respective authorities as priority. Jail menu should be followed according to the recommended daily allowance (RDA). Special diets should be provided where necessary example celiac disease. There should be regular screening of inmates to diagnose any health problem early so that prompt treatment can be started. There should be strict vigilance and counseling so that substance of addiction cannot reach the prisoners.

### Conclusion

This study showed that significant number of prisoners were not only nutritionally deficient but also had other risk factors like hypertension and smoking, substance abuse which predisposes these inmates to various health problems.

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