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Effect of Dietary Pattern on Nutritional Status of Prisoner

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Abstract: *Present study was conducted to determine the effect of dietary pattern on nutritional status of prisoner. 104 prisoners were selected purposively from 'Tangail' prison in Bangladesh. The study found that most of the prisoners are male (89.43%) and majority (54.8%) belongs to 20 to 30 age group. Nearly half of them quit their study before secondary school. Their daily meal pattern was breakfast (bread and jiggery), lunch (rice, pulse and vegetables) and dinner (rice, meat/fish/egg, pulse). Total kcal provided was about 1356 kcal (under trial) and 1425 kcal (trial) which was not sufficient to fulfill their daily calorie demand. About 63.46% respondents were well nourished, 22.11% were undernourished and 14.42% were overweight. Prisoners were abused mentally and physically by police (18.26%) and prisoner's leader (38.46%). Study observed that 88.46% prisoners were light activity level whereas 11.54% were sedentary but the rate of higher activity level was zero. Only 52/- BDT is allotted for each prisoner for food and this was too low to provide 2200 kcal per day. Government, ministry of home affairs and responsible authorities should come forward to assure nutrition and health security of prisoners.*

Keywords: *Diet, Health, Nutrition, Prison, Prisoners*

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I. Introduction

The word 'prisoner' means any person for the time being in a prison as a result of any requirement imposed by a court or otherwise that to be detained in legal custody [1]. More than 10.1 million people are held in penal institutions throughout the world, mostly as pre-trial detainees/remand prisoners or as sentenced prisoners. Almost half of these are in the United States (2.29m), Russia (0.81m) or China (1.65m sentenced prisoners). Prison population rates vary considerably between different regions of the world, and between different parts of the same continent. World Prison Population List shows that prison populations have risen in 78% of countries (in 71% of countries in Africa, 82% in the Americas, 80% in Asia, 74% in Europe and 80% in Oceania).[2] The number of unsentenced prisoners in adult corrective services custody increased by 22%, from 9,898 at 30 June, 2015 to 2016. Sentenced prisoners increased by 2% from 26,163 to 26,649 prisoners in Australia [3]. There are 69 jails including two specials jails in Bangladesh. In the jails there are about one hundred thousand prisoners, although the capacity is only 27,150. The main responsibility of the jail authority is to look after the prisoners, ensure hundred percent securities, bring discipline from in disciplined life and also food distribution [4]. Prison inmates have no control over the food they are provided and its preparation. Inmates can, however, use their own funds to buy a range of items each week from a "buy up" list, which includes a number of foodstuffs. The foodstuffs most commonly purchased by women including biscuits/cakes (29%), noodles (29%), eggs (19%), Among men, the most commonly purchased foodstuffs were more likely to be staple food items, including rice (27%), seafood (26%), noodles (25%), eggs (23%), meat (21%) and pasta (15%) [5].

1.2 Diet and Nutrition of Prisoners

Diet is an important contributor to a range of health conditions including obesity, type 2 diabetes, hypertension, cardiovascular diseases, cancer, dental disease, and osteoporosis [6]. Evidence continues to accumulate that consumption of fresh fruit and vegetables reduces the risk of a variety of cancers [7] [8]; cardiovascular [8] diseases. Nutritional status includes environmental, economic, biological, educational, and cultural factors, as well as issues pertaining to food security. Nutritional status directly affects the prisoner in items of physical and mental health development. The main medical conditions for which prisoners are treated include diarrhea and dysentery (42%), fever, including typhoid fever (25%) skin disease (20%), malnutrition (8%), psychological problems (1.5%) and heart problems (1%). The high frequency of diarrhea and skin disease is due to poor sanitation conditions prevailing inside prisons. The living conditions of prisoners in jails are unhygienic. This is due to overcrowding of the prisons with the large numbers of "under trials" [9]

The health of prisoners is influenced and determined by many factors acting in various combinations. Factors such as cigarette smoking or low socioeconomic status increase the risk of ill health and are commonly termed 'risk factors' [10]. Psychological and social deprivation, smoking and illicit drug use often underpinned. Body piercing, gambling, insufficient exercise and poor diet are additional risk factors. These behaviours threaten prisoner health and may lead to chronic diseases, illness and even death. Prisoners have a high prevalence of risk factors for cardiovascular disease and diabetes, including elevated blood glucose levels, high cholesterol, high blood pressure and also obesity [11].

1.3 Objectives of the study:

General objective:

The general objective of this study was to assess the dietary pattern and the effect of this dietary pattern on nutritional status of prisoners of "Tangail Prison" in Bangladesh.

Specific objectives:

The specific objective of the study -

- To assess the knowledge and practice of personal hygiene.
- To gather data about any mental dissatisfaction and immoral attitude of the authority.
- To suggest appropriate authorities of the government for any correction needed in prisoners diet and nutrition concept.

II. Methodology

The study was a cross sectional study and conducted in Tangail prison. The study period was 1st March to 31th August 2015. Simple random sampling methods were applied purposively to collect data. In this study a total of 104 prisoners were selected purposively in the Tangail prison.

A standard questionnaire was developed to obtain the relevant information regarding the general information, socio-economic information and individual information. Anthropometric measurement of prisoners and food frequency information sheet were also included in the questionnaire. The purpose of the pre-test was to test the content, wording, and expression, the topical sequence of questions and duration of the interview and the reliability of some items. After pre-test, the questionnaires related for quantitative data collection were improved and reformed to ensure content coverage, the reliability and validity of the study.

Body Mass Index (BMI) as the best method of measuring the nutritional status of prisoners was used according toWHO.

$$\text{BMI} = \frac{Weight\ in\ kg}{Height\ \ in\ m^2}$$

The data set were first checked, cleaned and entered into the computer from the numerical codes on the form. The data was edited if there is any discrepancy and then cleaned it. The frequency distributions of the entire variables were checked by using SPSS.12.0 windows program. For tabular, charts and graphical representation Microsoft word and Microsoft excel were used.

III. Results

The study was conducted in selected prisoners of Tangail prison in Tangail. A total number of 104 individuals were selected at Tangail prison. The objective of the study was to determine the knowledge about the effect of dietary pattern on nutritional status of prisoners as well as health and sanitation of prisoners of tangail prison. The findings of the study are critically analyzed and described herewith.

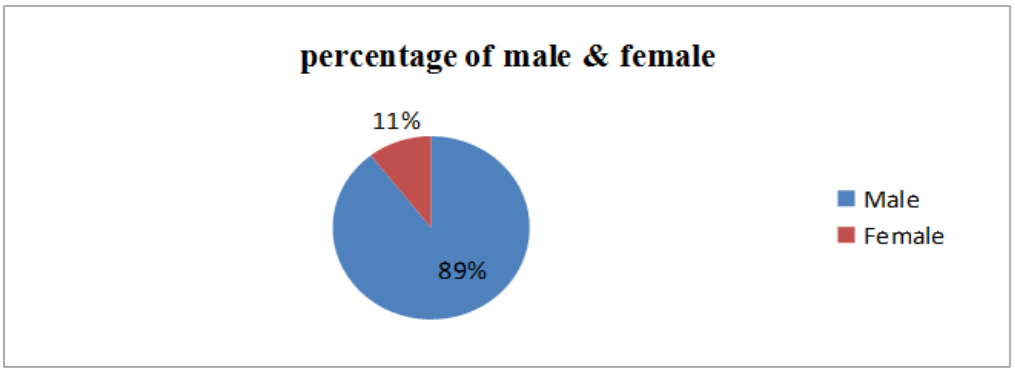

Figure 1: Percentage of male & female.

Figure 1 represents that the composition of respondents by gender characteristics. Comparatively a large number of the prisoners are male than female. In the total sample, 89.42% of the respondents were male and 10.57 % of the respondents were female. So it can be said that males are more involved in crime than females.

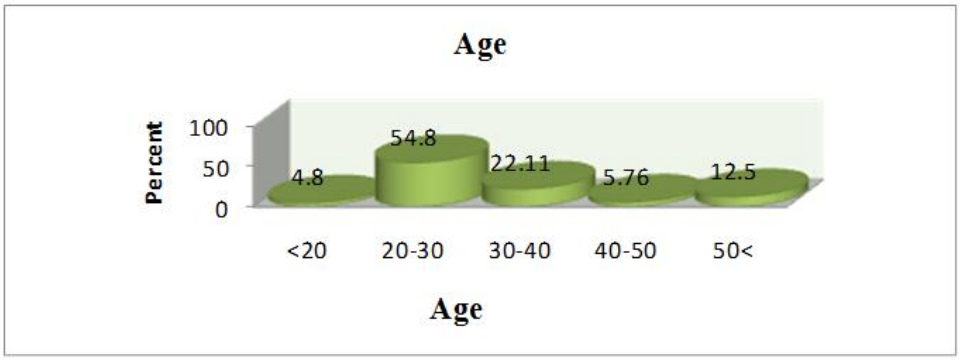

Figure2: Percentage of age of prisoners

Figure2 shows that 20-30 age group prisoners were more in prison which is 54.8% whereas, 4.8% were lower level age group prisoners whose age is below 20 years, 22.11% of the prisoner were in jail at the age of (30 -40) years, 5.76 % of the prisoners were between the age of (40-50) years and 12.5% prisoners were more than 50 age. Majority of the prisoners belong to age group ranged 20 to 30 years who are adults and only 4.8% of the prisoners belong to age less than 20 years.

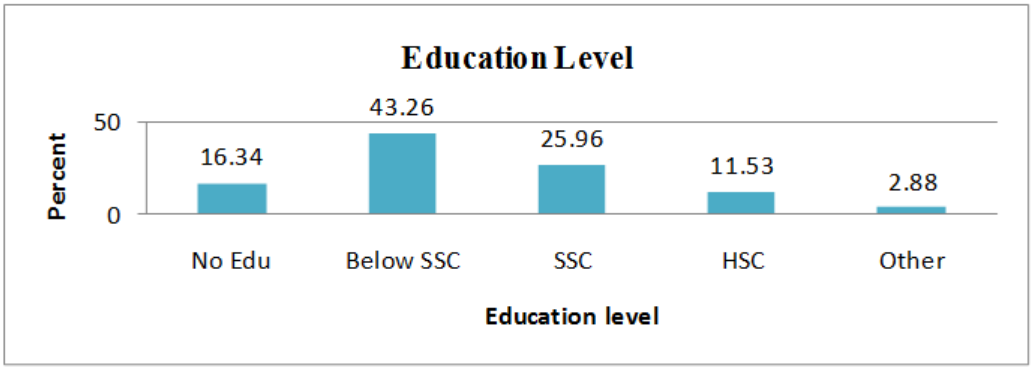

Figure 3: Percentage of education level of respondents

Figure 3 shows that nearly half of the respondents (43.26%) in the total sample reported to have a below secondary school academic qualification. In contrast, only 25.96% of the respondents had academic qualification of S.S.C and 11.53% having higher secondary education. While nearly 3% of them were studying in different levels. From the data it is easily understandable an increase in education level have the possibility to reduce the trend of committing crime.

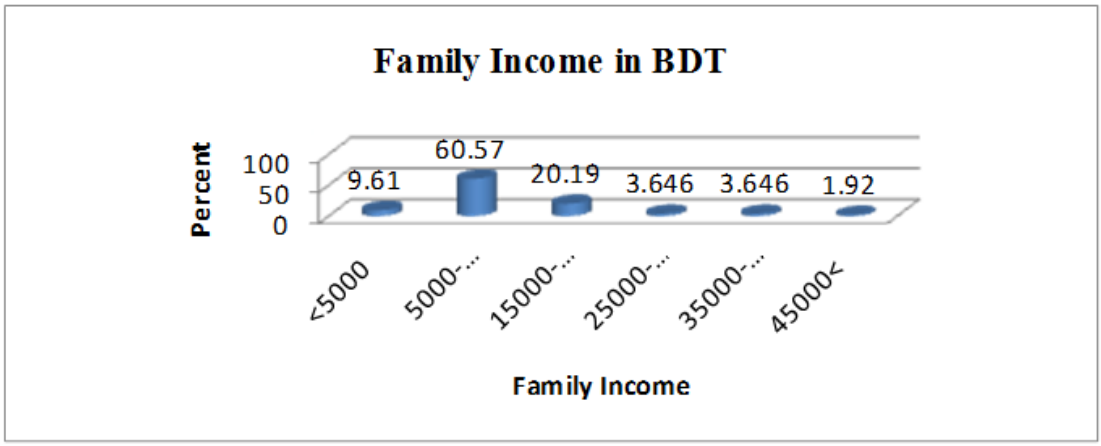

Figure 4: Percentage of family income of respondents (BDT)

Figure 4 have shown the amount of monthly income of households. Where 9.61% respondents were very poor income less than 5000 and only 1.92% respondents were in well income category of above 45,000 BDT per month. In contrast of the income reported, majority (60.57%) of respondents family income were about 5000-15,000 and 20.19 % of respondents family income were 15000-25000 BDT per month. Both taka 25000 to 35000 and 35000m to 45000 were 3.64% respondents separately. Prisoners whose family income was around 5000Tk, they were involved with crime more. Increased family income was responsible for reduction of the percentage of crime as because of less depression, financial support and many other facilities.

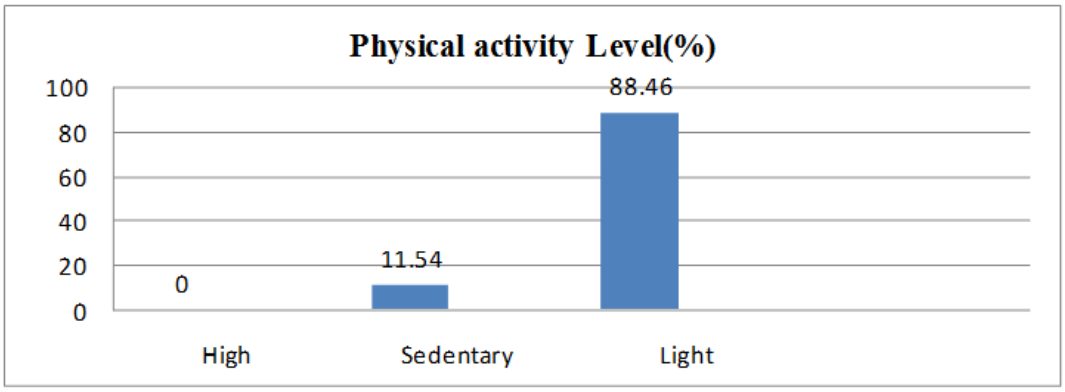

Figure 5: Percentage of physical activity level of prisoners

Figure 5 showed the percentages of activity level among respondents. The light activity level was 88.46%. Whereas sedentary activity level was the second highest percentage of 11.54% and the rate of higher activity level was zero. Light activity level of prisoners was highest number in jail and they require fewer amount of calorie than sedentary activity level of prisoners. But calorie which was provided by authority was insufficient for the prisoners.

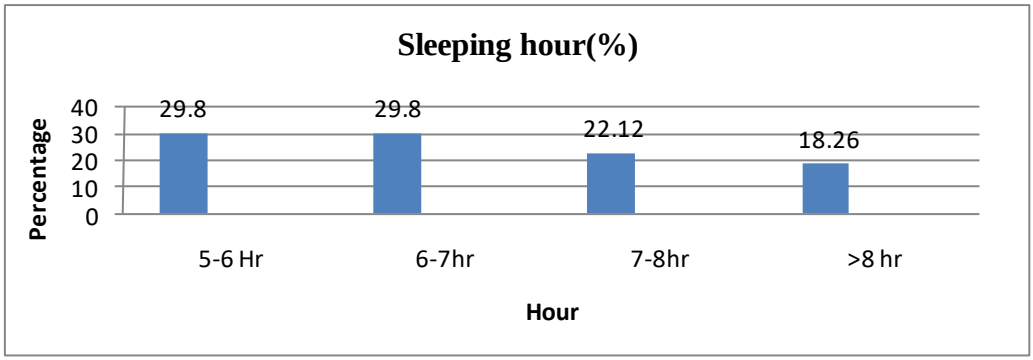

Figure6: Percentage of sleeping hour of respodents

Most of the prisonerssleep for 5-6/6-7 hours(29.80%). 22.11% of prisoners sleep for 7-8 hours and 18.26% 0f prisoners sleep for more than 8 hours. It is showed that nearly thirty percent of prisoner's sleeping hour is less because of their accommodation condition problems.Prisoners have to sleep in shifts owing to lack of space. Life in prisons is made worse by the smells of carbon dioxide, nicotine, sweat, and urine emerging from uncovered urinals, which create an unsanitary condition inside the congested wards.

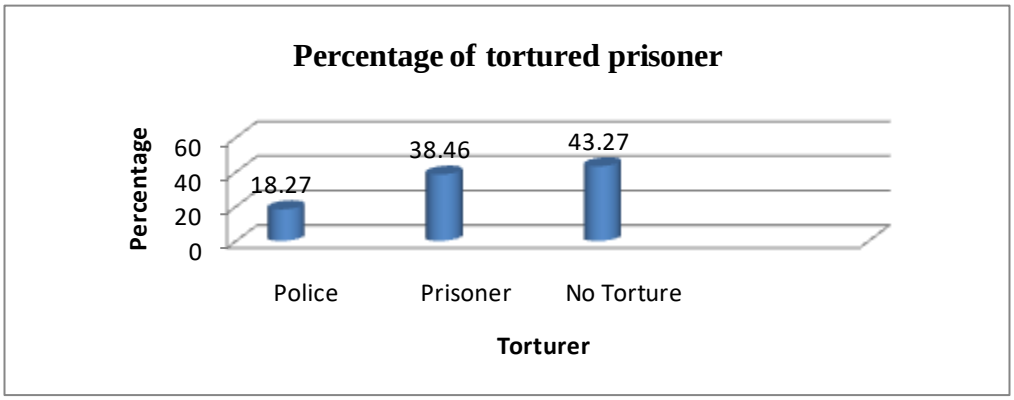

Figure 7: Percentage of tortured prisoner

Prisoners who were sufferedmental and physical torture by police (18.26%) and prisoner's leader(38.46%). This torture has effect on prisoner's health and nutrition. As a result they were in mental depression.

Table 1: Daily meal amount of prisoner

	Trial (prisoner)		**Under trial (prisoner)**	
Food Item	Weight(g)	Kcal	Weight(g)	Kcal
Bread	116.64	272.16	87.48	204.12
Rice(lunch)	291.60	291.60	291.60	291.60
Rice(dinner)	291.60	291.60	291.60	291.60
Gur	14.58	58.32	14.58	58.32
Fish or Meat	36.45	121	36.45	121
Vegetable	291.60	136.08	291.60	136.08
Oil	20.50	184.50	20.50	184.5
Pulse	145.80	69.90	145.80	69.90
Total		1425.16		1356.64

Table 2: Daily dietary pattern of prisoners

Time	**Food name**	**Serving size**
Breakfast	Bread	4(trial) /3(under trial)
	Jaggery	0.5
Lunch	Rice	4
	Pulse	2
	Vegetables	5
Dinner	Rice	4
	Fish/meat/egg	1
	Pulse	2
Total		22.5(trial)/21.5(under trial)

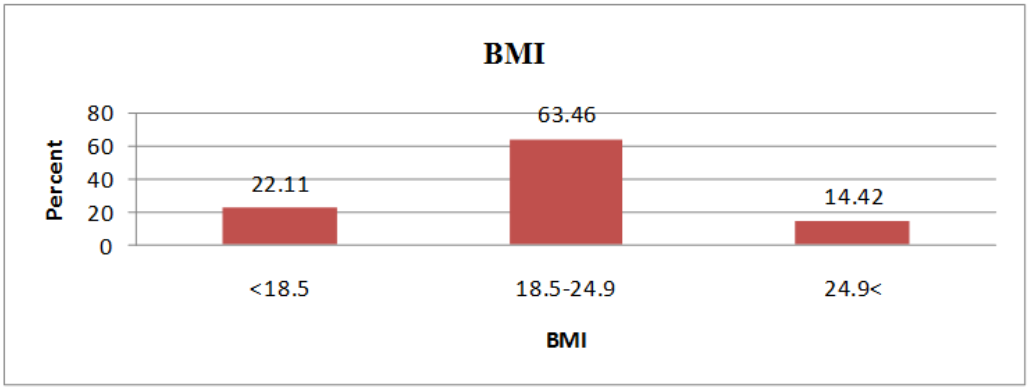

Figure 8: BMI of prisoners

Figure 8 shows that the normal BMI (18.5-24.9) is 63.46%, undernourished 22.11% (<18.5) and overweight 14.42% (>24.9) of the total prisoners.

IV. Discussion

Table 1 shows that bread(116.64g), rice(291.60g), They get sufficient amount of carbohydrate and they get fish or meat 36.45(g), vegetable 291.60(g), oil 20.50(g), and pulse 145.80(g) .They get sufficient amount of carbohydrate which fulfill their requirement. The table represent that almost same food has provided to all prisoners but more breads has given to trail prisoners than that of under trail prisoners. So under trial prisoners get fewer calories than trial prisoners. But they get less amount of protein rich food, such as egg, meat etc. Meat is alternative to egg. Milk is an ideal food and rich source of calcium and phosphorus. But it was not provided by authority. A widely cited randomised controlled trial conducted in the UK found that young prison inmates provided with dietary supplements including vitamins, minerals and essential fatty acids showed a 26% reduction in prison offences, including violence, compared with inmates administered placebo capsules [12]. Fruits are rich source of vitamin and minerals but they are always deprived of these foods. As a result, they suffer in many micronutrient deficiency diseases such as skin problem and night blindness. Most of them suffer in skin problems. They were serving three times per day. They did not provide any kinds of snack food at mid lunch, the amount of foods provided in jail are not sufficient for prisoners. So 70 % of them take food from outside. They take puffed rice, biscuit, tea, singara, puri, banana etc. So they suffer in many gastrointestinal problems. They did not get proper medical support. When any prisoners suffer in a communicable disease, they did not get extra care and others facilities and they were not separated from others prisoners. Many of them are

smoker and some of them are drug addicted. In 2005, a study in Australia found that women prisoners had poor nutrition, did less exercise and significantly poorer health outcomes than community women [13]. 100 % respondents drink tube-well water which contain trace amount of iron. Each prisoner is entitled to 36 sq. ft. of floor space; prisoners have to sleep in shifts owing to lack of space. Life in prisons is made worse by the smells of carbon dioxide, nicotine, sweat, and urine emerging from uncovered urinals, which create an unsanitary atmosphere inside the congested wards. These are painful examples of the denial of the legal rights of inmates. Overcrowded prisons are more difficult to manage humanely and effectively. Toilet, sanitation, and cooking facilities become inadequate to serve a growing prison population; the health of staff and inmates is at risk, making it more difficult to control contagious diseases. 100 % prisoner use soap after toilet and during bath, but only two soaps were provided per month.Although prisoners suffer from mental depression and tortured by police(18.26%) and other prisoners(38.46%). It is stated that most of the prisoners are normal BMI whereas 22.11% undernourished and 14.42% overweight. All prisoners drink tube-well water. 100% of the prisoners wash hand before taking meal and after toilet, they take bath regularly.

V. Conclusion

Across sectional study was carried out to determine effect of dietary pattern on nutritional status of prisoner of tangail jail. A fixed amount of food was provided for each prisoner. After cross sectional study, it is showed that a standard diet is necessary for prisoners. So the standard diet chart and sufficient amount of calorie requirement for both male and female prisoner are mentioned in recommendation. Although prisoners were provided with fewer calories than they needed, most of the prisoners have normal BMI. It may be due to collect foods from outside by themselves. Among them who were unable to purchase food from outside they were malnourished. It also shows that inmates are in mental stress and pressure. Although naturally prisoners suffer in mental depression, they were also tortured by police and other prisoner. Prisoners are generally well known about their personal hygiene and sanitation but toilet, sanitation, accommodation and cooking facilities become inadequate to serve a growing prison population. Prisoners are to sleep in shifts owing to lack of space. When someone of them suffers from various communicable diseases then they sleep together with others prisoner in same room. Health care system is not developed well enough.

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