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# Evaluation of Nutritional Status of Recently Hospitalized Patients

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**Abstract:** Three hundred and fifty five patients of various age groups were assessed for their nutritional status. Among these patients, 65 were children, 166 adult male, and 124 adult female. In children all the anthropometric parameters were lower than the reference values with the exception for age group 6.1 – 10.0 years, whose weight were more than the reference values. Hundred percent mal-nourishment was observed in male adults. All the parameters i.e. weight, upper mid arm circumference (UMAC), triceps-skinfolds (TSF) hemoglobin and blood sugar were lower than the reference values. The data collected for female adults also indicated that the females were hundred percent mal-nourished as well with the exception 51+ years of age whose weights were more than the respective standards or reference values. This study indicates the gravity of the problem of mal-nourishment that exists in the hospitalized patients. Therefore, there is an urgent need for the nutritional assessment/intervention in the hospitalized patients.

**Key Words:** Malnutrition, nutritional status, hospitalized patients

## Introduction

For any productive and useful life, one has to be healthy and well nourished. Nutrition, infact balanced nutrition is most important not only in terms of energy and nutrients but also for the improvement of immunological factors, mental caliber, and physical well-being etc. In order to know health condition and further to know whether or not an individual is well nourished, the assessment of nutritional status is pre-requisite. The aim of the nutritional status is to identify the risk group(s) in a community and to establish a baseline for the evaluation of deficiency(ies) of nutritional regimens and therefore, to facilitate the treatment of the medics or to provide a system of early recognition of the probability of health risk(s) due to nutritional deficiencies. Malnutrition exists any where in the world both in the community and in the hospitalized patients. The incidence of malnutrition in the hospitalized patients is because of many reasons. These are the disease condition itself, the stress of the disease, the stress of the physical/clinical investigations, the fear of facing the doctors and paramedics and of course the feeling of interruption to the privacy of the patient. The increased incidence of malnutrition in the hospitalized patients is associated with greater mortality rates, delayed functional recovery and therefore increased cost of nutritional/medical care both in hospital and at home (Convisky et al., 1999). In order to maintain proper nutritional status of a patient, there are some factors, which have to be considered on the day of admission. These includes, specific nutritional screening (clinical/biochemical), dietary investigations and nutritional counseling (Wyszynsky et al., 1998). It has been observed that malnutrition/deteriorated nutritional status of a patient is directly related to the stay in hospital. In other words, it means that higher is the degree of malnutrition the longer would be the stay in hospital. This problem is further aggravated due to lack of awareness or negligence of medics or paramedics about the deleterious effects of malnutrition and its clinical outcome. The screening for nutritional risks on the day of admission would enable the nutritionist to identify appropriate degree of intervention for a patient timely and in cost-effective manner (Corrish, 1999; Murphy et al., 2000; Corrish and Kennedy, 2000). In some studies, the malnutrition in the hospitalized patients has been reported to be associated with the lack of variety in the food which might limit the consumption of various nutrients (Cabral et al., 1998). Most often, the problem of nutritional status goes unrecognized. In critically ill patients it has been shown that patients receiving proper nutritional care shows slow but significant improvement in the nutritional status (Huang et al., 2000). Patients at risk for malnutrition have higher costs of recovery from disease (Chima et al., 1997). In a study conducted elsewhere, it has been shown that timely nutritional intervention improve the nutritional status of the hospitalized patients (Huang et al., 2000). Therefore, early nutritional assessment and appropriate nutrition interventions are required to improve clinical out-come and help to reduce the cost of health care (Hall et al., 2000; Wyszynsky et al., 1998). Therefore, an increased awareness is required with routine assessment of nutritional status in all hospitalized patients. The present study was conducted on the hospitalized patients in two leading hospitals of the North West Frontier Province (NWFP), Pakistan. The aim of this study was to evaluate the nutritional status of the hospitalized patients and to determine how their nutritional status deviates from their reference variables.

## Materials and Methods

**Location of the study:** The present study was conducted in the two leading hospitals of NWFP, i.e. Khyber Teaching Hospital (KTH), Jamrud Rd, Peshawar and Hayatabad Medical Complex (HMC), Peshawar, Pakistan.

**Sample size and selection:** Three hundred and fifty five patients of various age groups were assessed for their nutritional status. Among these patients, 65 were children, 166 adult male, and 124 adult female. Since these hospitals are well-established teaching hospitals therefore, the patients are attracted from all of over the province. Therefore, the patients were included in this study without further randomization within the hospitals. The patients belonged to various wards irrespective of the disease with exception that critically ill patients were not included.

**Anthropometric measurements:** The anthropometric included in this study were weight, height, Head-circumference (in case of children), upper mid arm circumference (in case of adults) and skinfold thickness (in case of adults). The body weight of the children was determined by using the digital beam scale and those of adults with the help of common bathroomscale. Height, head circumference and upper mid arm circumference were determined by using ordinary simple steel measuring tape. The skinfold-thickness was determined by using skinfold caliper.

**Biochemical measurements:** The various blood tests carried out for the diagnosis of diseases were recorded from the hospital records and compared with reference standards.

**Compilation of data:** The data collected was compiled and grouped according to the international age grouping system both for children and adult male and females patients. The difference between the actual reading and with the reference standard was determined. Then percent increase or decrease over the reference standard was calculated (WHO, 1983).

**Statistical Analysis:** The various age groups were coded and the corresponding data was fed to computer for the calculation of mean and standard deviation for the various variables by using a statistical package (MINITAB).

## Results

The raw data collected in the various wards of the hospitalized patients was compiled and compared with the international standards. The results are presented in the Tables 1 – 3. In children all the anthropometric parameters were lower than the reference values with the exception for age group 6.1–10.0 years, whose weight were more than the reference values.

The data for the children groups indicates that there was severe malnutrition in the hospitalized children. Similarly, when the data from the clinical test such as hemoglobin (Hb) or immunological factors (not shown in the data) were lower compared with the normal ranges. Most of them were anemic and stunted as well (Table 1 and Fig. 1).

The data grouped for male adolescents and adults and compared with their respective standards as well. Hundred percent mal-nourishment was observed in adolescents and adults. All the parameters i.e. weight, upper mid arm circumference (UMAC), triceps-skinfolds (TSF) hemoglobin and blood sugar were lower than the reference values (Table 2 and Fig. 2). From the hospital records it was noticed that in these patients the immunological factors were not lower (data not shown). The data collected for female adolescents and adults also indicated that the females were hundred percent mal-nourished as well with the exception 51+ years of age whose weights were more than the respective standards or reference values. All the parameters i.e. upper mid arm circumference (UMAC), triceps-skinfolds (TSF) hemoglobin and blood sugar were lower than the reference values with exception for weight (Table 2 and Fig. 2).

## Discussion

This study was conducted in the two main hospitals of NWFP, in order to know whether or not mal-nourishment exits in the hospitalized patients. It is fact that nutritional facilities in the public health care units are not available in this country. However, there are a few private health care units which provide nutritional care and counseling to the patients. In the developed countries, nutrition is recognized as an important factor in maintaining good health and as a preventive measure of diseases. This is the reason that the health care units in the developed countries have established nutrition rehabilitation units (NRUs) and proper nutritional assessment programme in the outpatient departments to provide dietary counseling/service. The root cause of diseases for both communicable and non-communicable is the malnutrition whether it is over-nourishment or under-nourishment. The present study indicates that most of the patients were having lower anthropometric indices (Fig. 1, 2 and 3). The patients either got malnourished in the hospital or they were having history of mal-nourishment. In literature, the observed mal-nutrition in the hospitalized patients has been shown to be because of several reasons. It has been observed that complications are significantly greater for patients who decline nutritionally, regardless of nutritional status at admission, compared with the reference group. This is associated with higher hospital charges and a higher

Table 1: Anthropometric and Biochemical Indices of the Hospitalized Children

| Variables | Age Groups (Years) | | | |
|---|---|---|---|---|
| | 0.5 – 1.0 (N=16) | 1.1 – 3.0 (N=17) | 3.1 – 6.0 (N=17) | 6 .1– 10.0  (N=16) |
| Weight (kgs | 6.0 ± 3.0 | 6.0 ± 2.0 | 13.0 ± 3.0 | 24.0 ± 9.0 |
| Recombinant length (cm) | 72.0 ± 23 | 69 ± 8.0 | 97 ± 10 | - |
| Head-circumference (cm) | 42 ± 0.0 | 43 ± 3.0 | - | - |
| Hemoglobin (g/dl) | 9.0 ± 2.0 | 9.0 ± 2.0 | 11.0 ± 3.0 | 10.0 ±1.0 |

Table 2: Anthropometric and Biochemical Indices of the Hospitalized Male Adolescents and Adult

| Variables | Age Groups (Years) | | | | |
|---|---|---|---|---|---|
| | 10.1-14.0 (N=33) | 14.1-18.0 (N=33) | 18.1-24.0 (N=33) | 24.1-50.0 (N=33) | 50.1+  (N=34) |
| Weight (kgs) | 27.0 ± 3.0 | 53 ± 6.0 | 51 ± 7.0 | 59 ± 8.0 | 63 ± 10.0 |
| Upper mid arm (cm) | 16 ± 0.0 | 23 ± 3.0 | 22 ± 2.0 | 23 ± 3.0 | 24 ± 3.0 |
| Triceps-skinfold thickness (mm) | 5.0 ± 1.0 | 4.0 ± 3.0 | 3.0 ± 1.0 | 5.0 ± 4.0 | 5.0 ± 3.0 |
| Hemoglobin (g/dl) | 9.0 ± 2.0 | 12.0 ± 1.0 | 11.0 ± 1.0 | 11.0 ± 1.0 | 11.0 ± 1.0 |
| Blood sugar (mg/dl) | 80 ± 12 | 75 ± 14 | 105 ± 34 | 102 ± 39 | 90 ± 24 |

Table 3: Anthropometric and Biochemical Indices of the Hospitalized Female Adolescents and Adult

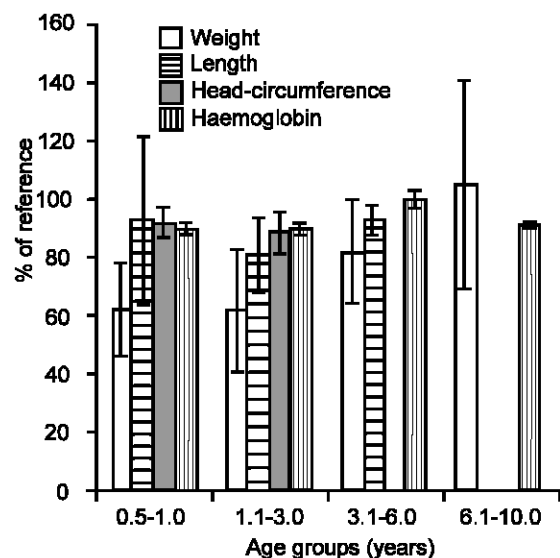| Variables | Age Groups (Years) | | | | |
|---|---|---|---|---|---|
| | 10.1-14.0 (N=26) | 14.1-18.0 (N=26) | 18.1-24.0 (N=24) | 24.1-50.0 (N=24) | 50.1+ (N=24) |
| Weight (kgs)/ | 42 ±1.0 | 52 ± 12.0 | 54 ±16.0 | 59 ±14.0 | 51 ± 13.0 |
| Upper mid arm circumference (cm) | 19 ± 2.0 | 24 ± 4.0 | 23 ± 4.0 | 24 ± 5.0 | 23 ± 4.0 |
| Triceps-skinfold thickness (mm) | 2.0 ± 0.0 | 8.0 ±4.0 | 8.0 ± 6.0 | 8.0 ± 6.0 | 7.0 ± 6.0 |
| Hemoglobin (g/dl) | 10.0  1.0 | 11.0 ± 2.0 | 11.0 ± 0.0 | 10.0 ± 2.0 | 11.0 ± 2.0 |
| Blood sugar (mg/dl) | 75 ± 0.0 | 108 ± 46 | 97 ± 25 | 96 ± 39 | 108 ± 66 |



Fig. 1:  Anthropometric indices and hemoglobin concentration of the children groups. The values are the mean for various age groups of the reference standard values for the corresponding groups.

likelihood of complications (Braunschweig *et al.*, 2000). It has been suggested that the nutritional assessment upon admission reflects the patient's nutritional and living conditions, current treatment and is predictive of patient's outcome (death or survival) (Gazzotti *et al.*, 2000). In hospital, the catering service systems can have a major impact on the nutritional intake of hospitalized patients (Wilson *et al.*, 2000). It appears that it is crucial to improve the quality of hospital catering, especially to prevent malnutrition (Rigaud *et al.*, 1999). Contributing to the problem of inadequate nutrient intake, patients are frequently ordered to have nothing by mouth and are not fed by any other route (Sullivan, 1999). This is associated with further aggravation of the problem. It has been proposed that evaluation of nutritional status in hospitalized patients is disregarded (particularly in this country) and a simple screening sheet can be used to identify patients in need of further nutritional assessment and treatment (Thorsdottir *et al.*, 1999). In the hospitals, patients show high nutritional instability, with high prevalence of both underweight and overweight. Food habits, demonstrate a lack of variety and a high frequency of food taboos, which might limit the consumption of various nutrients (Cabral *et al.*, 1998). In patients with less severe degrees of illness, the existence of malnutrition leads to a worse outcome than in sicker patients. Malnutrition continues to be a persistent problem in hospitalized patients, which can be readily identified using simple and easily available indices and, furthermore, readily treated (Giner *et al.*, 1996).

The facts reported in the contemporary literature regarding the causes and existence of mal-nourishment
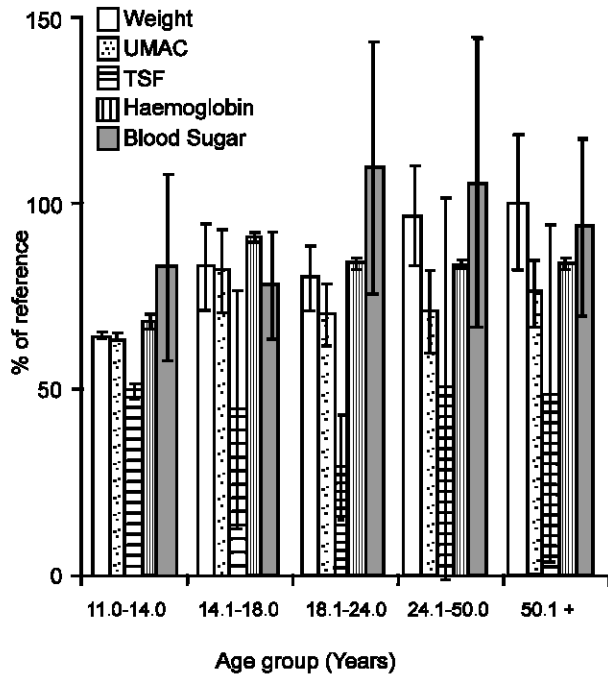
Fig. 2: Anthropometric and biochemical indices of the adult male groups. The values are the mean for various age groups of the reference standard values for the corresponding groups.
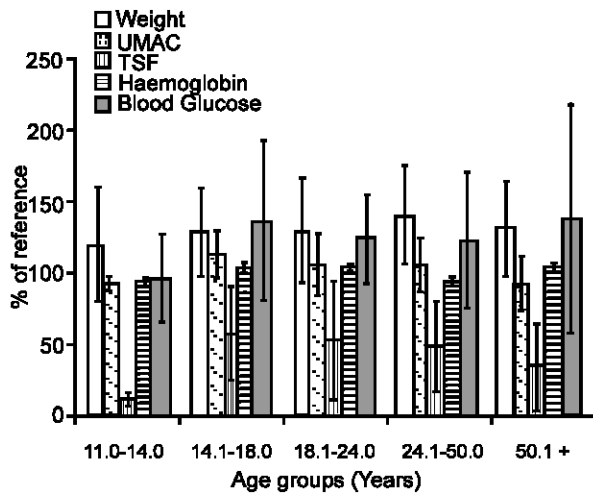


Fig. 3: Anthropometric and biochemical indices of the adult female groups. The values are the mean for various age groups of the reference standard values for the corresponding groups.

in the hospitalized patients can be attributed to the observed mal-nourishment in the patients under report. In medical practice (in this country) meager attention is given to the nutritional intake at the time assessment. In the hospitals for the hospitalized patients, no nutritional history is recorded. This practice has to be individualized

in terms of nutritional requirements. This would not only improve out-come but would also reduce the cost of treatment. This study is very limited but it indicates the gravity of the problem of mal-nourishment and there is an urgent need for the nutritional assessment / intervention in the hospitalized patients.

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