Nutritional Assessment and Dietary Patterns of Dengue Patients in Tertiary Care Hospitals of Pakistan

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Author's contribution

The sole author designed, analyzed, interpreted and prepared the manuscript.

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ABSTRACT

Dengue is viral infection caused by female mosquitos Aedes aegypti and Aedes albopictus. The current study was conducted a tertiary care hospital of district Mardan to find out the prevalence and dietary pattern of dengue patients. About a total of 75 patients consisting of 42 males and 33

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females were enrolled in the study. Data regarding socio-demographic parameters, anthropometric measurements, dietary data and overall health was collected. The data was analyzed through SPSS and excel. Out of 75 samples, patients with normal BMI were 13(17.3%), overweight 39(52%) and obese were 23(30.6%). Majority of the patients have symptoms including fever, abdominal pain, nausea vomiting, and headache. Consumption of fresh fruits, juices and proper diet lead to healthy phase. The preventive measures should be followed by using mosquito nets, proper sanitation system, and proper diet.

1. INTRODUCTION

Dengue is a viral illness that spreads through infected female mosquitoes, specifically *Aedes aegypti* and *Aedes albopictus* [1]. In 2010, it was estimated that there were 96 million dengue infections worldwide. The dengue virus consists of four distinct serotypes: DENV-1, DENV-2, DENV-3, and DENV-4. These serotypes belong to the *Flavivirus* genus. Identifying the specific serotypes involved in dengue outbreaks is crucial for effectively managing the disease, improving diagnostics, and developing vaccines that provide protection against multiple serotypes. The purpose of this study is to ascertain the prevalence rate of dengue virus serotypes in samples obtained from patients during the 2017 outbreak in Khyber Pakhtunkhwa, Pakistan. Globally, the four dengue virus serotypes DENV-1, DENV-2, DENV-3, and DENV-4 have been identified. They are members of the "*Flaviviridae*" family of the "*Flavivirus*" genus. The four dengue virus serotypes are descended from sylvatic strains that can be found in South East Asian woods [2]. Since each DENV serotype has a unique genetic make-up and is subject to genetic mutation, developing vaccines to protect against all four serotypes is challenging. Patients' immunity to one serotype will be retained if they develop it, but their immunity to another serotype will only last for a short time [2,3].

Dengue is a virus spread by mosquitoes that infects 390 million people worldwide each year [4]. According to a WHO assessment, 120 nations have struggled mightily in the past ten years to stop the spread of the dengue virus (DENV), and 2.5 billion people worldwide are at danger of contracting the disease [5].

More than 55,000 people, many of them youngsters, were hospitalized as a result of the dengue outbreaks in Pakistan. Every year since 2006, dengue epidemics have occurred and have become a significant health issue in Pakistan [6]. Dengue is endemic in many tropical and subtropical countries, and the spread of the disease is often linked to human migration. While the *Aedes aegypti* mosquito is native to Africa, global migration has contributed to its widespread distribution and its role as a major vector for dengue transmission. The movement of people across different regions has facilitated the introduction and establishment of *Aedes aegypti* populations in new areas, increasing the risk of dengue transmission. This highlights the significance of human migration in the global spread of dengue and the involvement of *Aedes aegypti* as a key vector in this process [7]. After the Second World War, the epidemiology and transmission of DENV became a significant burden in South East Asia [8].

In 1960, Hub, in Baluchistan, reported the first dengue case in Pakistan, which at the time had a population of 45.9 million people. There were just 12 dengue cases documented in Pakistan between 1960 and 1980.8 The first DENV outbreak in Pakistan was discovered in 1994, and two separate serotypes, DENV-2 and DENV-3, had been discovered in Karachi [9].

The dengue virus is a positive single-stranded RNA virus that is around 11 kilo bases (kb) in size and codes for a polypeptide protein with 3411 amino acids. The polypeptide produces non-structural proteins (NS5, NS4B, NS4A, NS3, NS2B, NS2A, and NS1) that are expressed inside infected cells as well as structural proteins (membrane, envelope, and capsid), which are responsible for the fundamental structure of the virus and do not participate in viral genome replication [10].

There are several clinical symptoms of dengue virus infection that can range from dengue fever (DF) to severe dengue disease (SDD), which includes dengue hemorrhagic fever (DHF) and dengue shock syndrome (DSS) [11]. Due to the excruciating agony in the muscles and joints, DF is also known as break bone fever. In the early stages, there is little distinction between the

symptoms of DF and DHF. Despite the fact that DHF induces viral hemorrhagic symptoms, vascular permeability that results in plasma leakage and thrombocytopenia [12]. On the other hand, plasma leakage, which happens when the blood's protein-rich fluid component spills from blood arteries into interstitial spaces and induces shock, is what distinguishes dengue shock syndrome (DSS) from dengue heart failure (DHF).

A third to forty percent of children with DHF are susceptible to DSS. The form of treatment is supportive and symptomatic. The mortality rate from DSS/DHF might approach 5%. The individuals who recovered from DF developed lifetime immunity against the serotype of dengue that had infected them [13]. Identifying the specific serotypes of the dengue virus during an epidemic is of utmost importance for effective management of the disease, as well as for the development of improved diagnostic methods and polyvalent vaccines. Given the prevailing situation of dengue infection in Pakistan, it is particularly crucial to investigate the prevalence of different dengue virus serotypes in the region.

2. LITRATURE REVIEW

Subedi et al. [14] conducted a study on the epidemiology of dengue, History of incidence, current prevalence and strategies for future control in Nepal. The study shows that Aedes mosquito-transmitted infection is regarded as a major re-emerging tropical disease around the world. Just ten years ago, a number of tropical and subtropical places in Nepal, report native dengue cases. As a result, the infection's geographic spread has expanded over the entire nation. The two biggest epidemics to date, in 2010 and 2013 spread rapidly throughout the country's central region.24 people died of dengue and more than 7000 were found to be experiencing clinical manifestation. Effective vector surveillance investigations must be carried out as soon as possible, and diagnostic virology labs must be available. The review gives a current overview of dengue in Nepal and discusses the disease's chances of being controlled there in the future.

Ali et al. [15] conducted a study on The Prevalence of dengue fever during 2011-2012 in Punjab shows that Pakistan has had several cases of dengue fever, prevalence data were gathered from November 2011 to May 2012. Nine Lahore towns provided data, which was gathered. According to the findings, there were 11,283 dengue cases registered in nine municipalities' various hospitals. Data Ganj Baksh had the highest prevalence (18.3%), while Gulberg and Cantt Town had 13.3% and 12.6%, respectively. Each of the towns of Allama Iqbal and Samanabad has a prevalence rate of 11.9%. Wahga Town, where a prevalence of 1.5% was observed, was the least afflicted location. In Samanabad town, males accounted for 89% (1192) of the dengue fever (DF) cases, which was the highest prevalence of the disease by sex. Females in Shalimar town had a higher prevalence of the DF (35%). The highest frequency of DF was identified in the age range of 21 to 30 years (23.14%), compared to all other age groups. Men and those between the ages of 21 and 30 are more likely to contract dengue fever than other age groups. It is advised to keep the area around busy areas dry and free of standing water. Regular inspections of potential mosquito breeding grounds are necessary.

Islam et al. [16] conducted a study on the various factors in Pediatric to severe dengue infection-A retrospective study shows that in tropical, subtropical, and temperate regions of the world throughout the past three centuries, dengue outbreaks are known to have happened. In nations where dengue is prevalent, there are roughly 2.5 billion people living, according to the World Health Organization (WHO) to evaluate the several factors that contribute to severe dengue infection in children. From January to June 2021, a hospital-based retrospective study was carried out in the Emergency, Observation and Referral Unit of Bangladesh Shishu Hospital and Institute in Dhaka, Bangladesh, 52 patients were included in the study. Children who presented within the first 48 hours of developing a fever had a strong clinical suspicion of having dengue infection were tested. 102 individuals of whom 52 (50.98%) had dengue infection confirmed by serology. There were 23 (44.2%) female patients and 29 (55.8%) male patients. Twelve patients (11.76%) met the requirements for dengue haemorrhagic fever, while 38 (37.25%) of the patients had conventional dengue fever. Six of the individuals had dengue shock syndrome. The majority of cases 52 cases, or 68.49% involved children under the age of 18. The most prevalent symptoms followed by headache, myalgia, vomiting, etc. Hepatic dysfunction, renal failure, multi-organ failure, and encephalopathy were the most frequent side effects.

Kelley et al. [17] conducted a study on the molecular characterization and phylogenetic

analysis of dengue fever viruses in three outbreaks in Tanzania between 2017 and 2019 which shows that Tanzania saw significant outbreaks of dengue, in 2014 and 2019. With a median age of 29 years and 1,381 probable dengue fever patients who were referred to the National Public Health Laboratory for confirmation of DENV infection, examined archival serum samples from these patients. In 823 cases (59.6%), DENV was verified. Nearly three quarters (73%) of the affected people lived in Kinondoni district, Dar es Salaam, and more than half (54.7%) of dengue fever patients were male. While DENV-1 Genotype, V was responsible for the 2019 pandemic, DENV-3 Genotype ш was responsible for the two minor outbreaks in 2017 and 2018. The discovery of the DENV-1 Genotype in one patient in 2019.

Khan et al. [1] conducted a study on prevalence of dengue virus serotypes in the 2017 outbreak in Peshawar KP, Pakistan shows that an infectious virus called dengue is spread by female Aedes aegypti and Aedes albopictus mosquitoes. 96 million illnesses were expected to exist globally in 2010. The dengue virus, which is a member of the Flavivirus genus, has four different serotypes DENV-1, DENV-2, DENV-3, and DENV-4. The current study's aim is to ascertain the prevalence rate of dengue virus serotypes in patient samples obtained during the 2017 dengue outbreak in KPK, Pakistan. A total of 800 positive samples were collected, of whereby 513 samples (290 men and 223 females) had PCR results that were positive. Out of 513, 25 had serotype 1 (5%), 196 had serotype 2 (38%), 192 had serotype 3, 56 had serotype 4, and 44 had mix serotypes. It was determined that the dengue virus serotypes 2 and 3 pre-dominated during the 2017 outbreak in Peshawar, the capital of KPK, Pakistan.

Ahmad et al. [18] conducted a study on the epidemiology of dengue in Pakistan, present prevalence and guidelines for future control. The study shows that dengue is a serious vector-borne virus disease that affects people worldwide in both trophic and sub trophic zones. Aedes aegypti and Aedes albopictus females are responsible for this. According to the WHO, dengue is a global problem that affects over 128 countries, with about 100 million cases recorded worldwide and more than 390 million people at risk of infection each year. Since 2005, the dengue epidemic in Pakistan has posed a serious concern to the public. As of 2016, there

have been 757 recorded dengue-related fatalities. Climate change, urbanization, travel, poor communication, and a lack of surveillance are the main causes. Pakistan experienced the worst dengue outbreak in 2011, with 21685 confirmed cases and 350 fatalities.

Idrees and Ashfaq [19] conducted a brief review on dengue molecular virology, diagnosis, treatment and prevalence in Pakistan. The study shows that infection with the dengue virus is a significant health issue that affects 2.5 billion people globally. More than 100 nations, including Pakistan, have dengue as an endemic disease, due to the four viral serotypes, there is currently no vaccination for the prevention of dengue virus. Dengue infection can be fatal to patients in its most severe forms. This provides an overview of dengue molecular virology, significant pharmacological targets, prevalence in Pakistan, diagnosis, treatment, and dengue-fighting plants.

Rajapakse et al. [20] conducted a study on treatment of dengue fever. The study shows that there are almost 60 nations where dengue fever is endemic, and 2.5 billion individuals could get sick from it. Over the past 50 years, dengue cases have increased dramatically with thousands of people impacted, epidemic waves of diseases that occur in endemic areas place a tremendous burden on a nation's health care system's limited resources. Dengue fever may be lethal in this extreme form. There are a number of problems that make it difficult to combat dengue, including a lack of knowledge about the precise pathophysiology of the infection, the inability to effectively control the vector population, the lack of a particular therapy for the virus, and the technical challenges involved in generating a vaccine. This review gives a general summary of the epidemiology, natural history, management techniques, and prospective future prospects for dengue research, such as the creation of a vaccine.

Asrita et al. [21] conducted a study of prevalence rate epidemiology, risk factors and clinical course of dengue fever in tertiary care hospital. The study shows that Swahili term ka-denga pepo, which means that the disease is being brought on by an evil spirit, is where the word "dengue" originally came from. The four different serotypes of the dengue virus (DEN-1, DEN-2, DEN-3, and DEN-4) are arthropod-borne viruses that belong to the genus Flavivirus and family Flaviviridae. On patients admitted to the Maharaja Institute of

Medical Sciences in Vizianagaram, Andhra Pradesh, India, a total of 100 patients were included in our investigation 54 female and 46 male individuals out of 100 total patients, in which 6 were smokers and 94 were non-smokers, 4 alcoholics and 96 were non-alcoholics. 68 patients reported experiencing high grade fever symptoms, while 64% of patients reported experiencing myalgia symptoms. 100 patients were evaluated, and 55 of them had headaches. The most common symptom in almost all patients is a decrease in platelet count (thrombocytopenia). 8% of patients had signs of dengue infection returning.

Banerjee [22] conducted a study on importance of proper nutrition in dengue infection. The study shows that in India, dengue fever has emerged as one of the most serious public health concerns. The affected individuals had been recuperating at home for 4-5 days due to fever or acute dehydration symptoms, including vomiting, abdominal pain, low platelets, and fever. For IV fluids, hydration, and vital sign monitoring, some of these extremely ill individuals are brought to the hospital. The aim of this research is to evaluate nutritionally integrated home-based care for dengue, including liquid diet, using a mosquito net and paracetamol as a fever-reducer against infections. For controlling platelet count and enhancing immunity against the virus, all macro and micronutrients are crucial in proportion to extra water and electrolyte beverages.

Poojary et al. [23] conducted a study on biochemical role of zinc in dengue fever. The study shows that zinc is crucial for viral infections. The goal is to confirm the relationship between zinc and certain dengue enzymes. 100 dengue patients and 50 healthy controls had their plasma zinc, butyryl cholinesterase (BChE), and erythrocyte acetylcholinesterase (AChE) levels measured Spectro photometrically. ELISA was used to determine MMP9. When compared to healthy controls, dengue fever patients' plasma zinc levels were significantly lower (P 0.05), both BChE and AChE were considerably lower in these patients (P 0.001). Despite being statistically insignificant, there was a rise in MMP9 in dengue patients. Although the correlation was statistically negligible, zinc levels in dengue and controls significantly correlated with cholinesterase's and MMP9. The study emphasizes the significance of zinc in the pathogenesis of dengue since it is necessary for cholinesterase and MMP9 to continue their

anti-inflammatory and tissue-remodelling functions.

Poornima et al. [24] conducted a study on feeding pattern followed by hospitals for patients with dengue fever. The study shows that there are three different conditions under which dengue can arises, dengue shock syndrome, dengue haemorrhagic fever, and dengue fever (DF). Studying the food assistance provided to DF patients admitted to hospital, 48 patients (16 children and 32 adults) diagnosed with dengue fever throughout the months of January to May (3 government hospitals and 2 private hospitals were included. Water intake through the mouth and IV infusions were noted. Patients were categorized as seriously ill, moderately ill, or mildly ill based on their symptoms, level of consciousness, and tolerance to food and water. Most adults (71.9%) and kids (56.3%) consumed a typical diet. Patients (adults and children) in all three groups consumed much less energy and protein than the RDA.

Islam et al. [16] conducted a study on the effect of nursing management protocol for dengue fever patients on their awareness, activities daily living and health outcomes. The goal of the study was to ascertain how the nursing management strategy for dengue fever patients affected their awareness, daily activities, and health outcomes in Qena Tropical Medicine Hospital. Convenience samples were 60 adult patients of both sexes who had been positively identified as having dengue illness. In this investigation, three instruments were used. Tool 1: A basic data interview schedule, Tool:2 Daily activities based on fever (The Barthel Index), Tool 3 involves the evaluation of laboratory studies, vital signs, and patient complaints. Results/conclusions of nursing management protocol with educational component, therapeutic clinical treatment (supportive care and fluid volume replacement), and food regimen.

Sunidhi et al. (2016) conducted a study on the prevention and control of dengue by diet therapy. The study's goal was to use nutrition therapy to treat and prevent dengue. In this study, 300 dengue patients from India's Sahara Hospital in Lucknow, U.P, were chosen. All patients received both medical treatment and nutrition therapy. The fundamental diet principles were consuming a lot of protein, drinking a lot of liquids. In order to maintain the electrolyte balance and RBC count, patients were given coconut water, juices, soups, and lemon water that were rich in vitamins (B complex, K, C),

minerals (manganese, potassium), and poly-nutrients. Vegetables and fruits were included in the diet as very soft meal items. Patients were shown to have increased appetites and to have maintained their nutritional status.

Valdez et al. [25] conducted a study on the clinical response in patients with dengue fever to oral calcium plus vitamin D administration. The study shows that one of the most significant issues with public health in tropical and subtropical regions of the world is a dengue outbreak. On Mexico's eastern coast, Tamaulipas recorded 7062 dengue cases in 2005, of which 1832 (or 26%) were identified having a severe headache, nausea, and vomiting are all symptoms of dengue fever. Patients with DHF appear to have an immunological mechanism of thrombocytopenia caused by enhanced platelet breakdown. Standard medical care consists only of electrolytic solutions, rest, assessments of the patient's body temperature, blood pressure, and platelet count, and the injection of antipyretics such paracetamol when the patient's fever is too high. In people infected with the Dengue Virus (DV), extracellular calcium is crucial for platelet aggregation and for controlling the immunological response, and di-hydroxy vitamin D has recently been revealed to affect IL-12 production and dendritic cell maturation. We discuss the experiences of five individuals who received oral calcium carbonate together with vitamin D3 and had improvements in their general health [26,27].

3. MATERIALS AND METHODS

1. Design of the study: A clinical based study was conducted to gather information on the dietary pattern of dengue patients in a tertiary care hospital of District, Khyber-Pakhtunkhwa Pakistan.

2. Study location: The entire research was conducted in 3 hospitals of District Mardan including DHQ, LMC and Type D hospital Landward.

3. Sample size: A total of 75 (42 males and 33 female) from 3 hospitals including DHQ, LMC and Type D Landward were enrolled in the study.

4. Data collection: The data for the study was collected using a well-constructed questionnaire.

Data regarding socio-demographic and anthropometric parameters, clinical assessment and dietary intake were collected.

Anthropometric data: Anthropometric data including weight, height was collected by using standard procedures.

Height: Height of an individual was measured by using an instrument known as stadiometer, used to measure human height. It is constructed out of a ruler and a sliding horizontal headpiece which is adjusted to rest on the top of the head. The subject whose height to measured is asked to remove her shoes and socks, stand straight over the stadiometer and it is ensured that they are standing perfectly straight with their head and back forward and against the wall, directly under the drop-down measuring device. The nose and ears of the individual should be parallel to the floor and after ensuring that the individual is all set for her height measurement the horizontal head piece must be gently placed on the top of the head and height is measured [28].

Weight: The weight of an individual was measured using a weighing scale or weight machine. Weight machine or weighing scale is an instrument used to measure weight or mass. It is also known as mass scale, balance scale or weight balance. The weight of an individual to be measure on the weighing scale is asked to remove any heavy extra clothing, shoes and accessories in order to avoid extra weight and then the individual is asked to stand still on the weight machine and her weight is recorded in kg [29].

Body mass index (BMI): BMI was calculated according to the criteria approved by WHO, which is calculated by taking weight in kilograms divided by height in meter square (kg/ m^2). BMI of less than 18 kg/m^2 is considered as underweight, BMI ranging from 18.5-24.9 kg/m^2 is considered as normal while BMI ranging from 25.0- 29.9 kg/m^2 is considered as overweight. BMI of greater than 30 kg/m^2 is considered as Obese (WHO 1998).

Dietary assessment: This section collected data regarding dietary intake of the patients by using questionnaire [30].

Statistical analysis: The statistical analysis was carried out using Microsoft Excel software and SPSS [31].

4. RESULTS

4.1 Sociodemographic Information

Table 1 shows age distribution of patients. Out of 75 study subject high percentage 40% (n=30) were in 17–29 age range followed by 30.6% (n=23) into the 30-42 age range, and 29.3% (n=22) into the 43–55 age range. Similarly, majority of study subjects 73.3% (n=55) were married and 26.6%(n=20) were single. More than half of the subjects were male 56% (n=42) while 44% (n=33) were female. According to data analysis, the age group most impacted by dengue was 17–29.

Table 2 shows that out of 75 samples, patients with normal BMI made up 13, overweight people made up 39, and obese people made up 23, or 30.6% of the total. According to data analysis, the BMI group with the most impact was overweight, at 39 (52%) as indicated in the table.

Table 1. Socio demographic information

Variables	Categories	Frequency (n)	Percentages (%)
	17-29	30	40
Age of Respondents	30-42	23	30.6
	43-55	22	29.3
Marital Status	Married	55	73.3
	Unmarried	20	26.6
Gender	Male	42	56
	Female	33	44

Table 2. BMI of the respondents

Variable	Categories	Frequency (n)	Percentage (%)
BMI for age	Normal	13	17.3
	Overweight	39	52
	Obese	23	30.6

Table 3. General manifestation of Dengue fever

	Categories	Frequency (n)	Percentage (%)
High fever	Yes	75	100
	No	0	0
Nausea, Vomiting	Yes	33	44
	No	42	56
Abdominal pain	Yes	27	36
	No	48	64
Infected from anyone else	Yes	13	17.3
	No	62	82.6
Anyone else in family	Yes	30	40
infected with dengue	No	45	60
Proper sanitation	Yes	58	77.3
	No	17	22.6
Feeling of fatigue	Yes	63	84
	No	12	16
Standing water	Yes	57	76
	No	18	24
Headache	Yes	60	80
	No	15	20
Pain in bones, muscles	Yes	46	61.3
	No	29	38.6
Cover clean water	Yes	57	76
	No	18	24
Medicine for dengue	Yes	49	65.3

Table 4. Dietary pattern for dengue patients

	Categories	Frequency(n)	Percentages (%)
Consumption of juices	Yes	53	70.6
	No	22	29.3
Proper diet	Yes	30	40
	No	45	60
Wash everything before eating	Yes	75	100
	No	0	0

	Categories	Frequency(n)	Percentages (%)
Consume vegetables	Yes	57	76
	No	18	24
Take fresh fruits	Yes	44	58.6
	No	31	41.3
Take dairy products	Yes	45	60
	No	30	40
Vitamin C rich foods	Yes	28	37.3
	No	47	62.6

Table 3 shows that 100% (n=75) subjects have a high temperature. Patients with nausea and vomiting made up 44% (n=33), those who experienced abdominal pain were 36%(n=27), 17.3%(n=13) subjects had contracted the illness from someone else, 40% (n=30) had family history of the disease. 21.6%(n=17) have an inadequate sanitation system. 84% (n=63) have feeling of fatigue. In 76% (n=57) of the patients' residences, there is standing water. 80% (n=60) of the patients have severe headache. 61.3%(n=46) experience discomfort in their bones and muscles. There are 76% (n=57) who have access to clean water, 65.3% (n=49) who take dengue medication, 66.6% (n=50) individuals with dengue fever were hospitalized for the disease. 40%(n=30) of subjects use mosquito net.

Table 4 shows that 75 patients were questioned about their liquid consumption. 70.6%(n=53) consumed juices, 40% (n=30) followed a good diet, 75% wash everything before using. 76% (n=57) consumed vegetables. Consumption of fresh fruits were 58.6%(n=44), Consumption of dairy products were 60% (n=45). Consumption of vitamin C rich food were 37.3%(n=28).

5. DISCUSSION

In this investigation, both male and female individuals were included. Out of 75 patients, the study found that 33 (44%) were female and 42 (56%) were male. There were 75 patients, 17.3% of whom had a normal BMI, 52% of whom were overweight, and 30.6% of whom were obese. Comparable findings from this study and (Islam et al.2023) were obtained. According to an analysis of 102 patients with probable dengue fever, dengue infection was detected in 52 (50.98%) of them using serology. The gender split was 29 men (55.8%) to 23 women (44.2%). It occurs in nearly all cases and is followed in frequency only by headache, nausea, and vomiting. In this study, severe headaches affect 60 (80%) individuals while vomiting affects 33 (44%) patients.

Poornima et al. [24] state that. Most adults (71.9%) and kids (56.3%) consumed a typical diet. Patients in all three groups consumed much less energy and protein than the RDA. Consumption of energy dramatically increased. Both adults and toddlers consumed very little protein. A proper diet was followed by 30 (40%) people, energy drinks were drunk by 53 (70.6%), and dairy products with proteins were consumed by 45 (60%) people, according to the survey.

The survey reveals that 45 (60%) people use mosquito nets as protection, 50 (66.6%) people were hospitalised due to their critical condition, and 49 (65.3%) people used dengue fever medications. This outcome was contrasted with that of Benerjee [22]. According to the study, the main objective is to provide home-based, affordable nutrition-integrated care for dengue. using a mosquito net and paracetamol to lower fever. Only patients with severe illnesses are admitted to the hospital for IV hydration and vital sign monitoring.

According to the survey, fresh fruit intake was 44(58.6%), vegetable consumption was 57(76%), juice consumption was 53(70.6%), and consumption of vitamin C-rich meals was 28(37.3%). in contrast to (Sunidhi et al. 2016). Along with medication, food treatment was used to treat all of the patients. The patients were given high protein diets, coconut water, juices, soups, and lemon water that was packed with vitamins (B complex, K, and C). Vegetables, green leafy vegetables, paneer sandwiches with fruits, and paneer veggies with curd are all part of a soft diet.

6. CONCLUSION

Out of a total of 75 samples, the study's findings indicate that 42 of them were male and 33 were female. The majority of individuals suffer from symptoms like a high fever, vomiting, nausea, and headaches. There was an inadequate sanitation system for 58 patients. Patients' dwellings have standing water in 76% of cases.24 % lacked access to usable clean water. There is practically little use of mosquito

nets.60% of patients did not follow a good diet, which made them vulnerable to dengue and other diseases.

7. RECOMMENDATIONS

The current study work concluded with the following recommendations.

1. Proper diet must be taken to boost our immune system.
2. Focus on proper sanitation system.
3. Use of mosquito net is necessary for protection against dengue
4. Cover clean water for use.
5. Furthermore, research should be done regarding dengue fever in order to aware patients about its consequences.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

Author(s) hereby declares that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of manuscripts.

ETHICAL APPROVAL

As per international standards or university standards written ethical approval has been collected and preserved by the author(s).

COMPETING INTERESTS

Author has declared that no competing interests exist.

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