## DECLARATION

I declare that thesis entitled **"STUDY ON THE NUTRITIONAL ASSESSMENT OF RAJBANSHI ADULT WOMEN OF NORTH BENGAL"** has been prepared by me under the supervision of Assistant Prof. Dr. Argina Khatun, Department of Anthropology and University of North Bengal. No aspect of this thesis has ever been used to justify the awarding of a degree or fellowship.

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*Date :* 30.05.2022

**TO WHOM IT MAY CONCERN**

(1) This is to certify that **Ms. Isita Sinha** is a registered Ph.D. research scholar working under my guidance at Department of Anthropology, University of North Bengal, Darjeeling, West Bengal. She has been undertaking research work under my supervision for her Ph.D. work entitled **"Study on the nutritional assessment of Rajbanshi adult women of North Bengal".**

(2) Ms. Sinha personally carried out fieldwork in connection with her Ph.D. work. Her Ph.D. thesis is based on original data-set collected by her.

(3) I also certify that the content of the thesis has not been submitted to any other University/Institution for the procurement of Ph.D. Degree/any other Degree/Diploma/other academic award.

(4) Ms. Sinha has incorporated all the recommendations/ suggestions/modifications forwarded by the Ph.D. committee in Anthropology for the improvement of the thesis.

(5) I am satisfied on her performance and progress of the Ph.D. work.

(6) I am recommending her thesis for submission for the procurement of Ph.D. Degree in Anthropology.

(7) Finally, I hope she will be awarded a Ph.D. degree and wish her all success in life after successful completion of her Ph.D.

Argina Khatun 30/05/22
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STUDY ON THE NUTRITIONAL ASSESSMENT OF RAJBANSHI ADULT WOMEN OF NORTH BENGAL THESIS FOR PhD DEGREE (SCIENCE) IN ANTHROPOLOGY UNIVERSITY OF NORTH BENGAL SUBMITTED BY ISITA SINHA UNDER THE SUPERVISION OF Dr. ARGINA KHATUN ASSISTANT PROFESSOR DEPARTMENT OF ANTHROPOLOGY UNIVERSITY OF NORTH BENGAL 2022

CHAPTER I INTRODUCTION

1.1 An Overview Nutrition can be defined as the process of ingesting food and utilizing it for the purposes of development, metabolism, and repair. It refers to how an organism consumes, absorbs, transports, uses, and excretes dietary substances (Lagua and Claudio, 1996). Nutrition is the study of the nutritional content of various foods, as well as the amount of nutrients required for optimal growth and function, and how this varies for different people. A living organism's ability to grow, maintain, and reproduce is aided by the process of nourishment. Human nutrition research is multidisciplinary, encompassing not only biochemistry, physiology, and molecular biology, but also psychology and anthropology, which investigate the impact of attitudes, beliefs, preferences, and cultural tradition on food consumption. It may be further connect with economics and political science as the world responds to the suffering and death caused by malnutrition. As a result, nutritional science has a considerably broader research field with new technology and social change, which provide new opportunities (Pelletier et al., 2013). One of the most essential variables impacting the quality of human life is nutrition. Nutritional science aims to promote optimal health by lowering the risk of chronic diseases (such as cancer and cardiovascular disease) and preventing nutritional deficient diseases (such as kwashiorkor and pellagra). Human body needs a good nutrition through a well balanced diet to fulfill body requirements and to maintain body functions. A poor diet can result in a lack of essential nutrients (Causes malnutrition) or excessive calorie consumption (overeating) (Causes overnutrition). Undernutrition and overnutrition are currently two of the main causes of death worldwide. For developing countries like India, both undernutrition and overnutrition are important health issues. Double burden of malnutrition causes nutrition related complications and different

diseases with decreasing the power of immunity. Undernutrition impairs physiological function, resulting in low weight, growth retardation, a weakened immune system, which leads to an increase in infections, the emergence of chronic diseases (such as diabetes mellitus, hypertension, and coronary heart disease), and mental health problems ( Hoet JJ, 1997; Martins et al., 2002 and Muller and Krawinkle, 2004). Whereas overnutrition (obesity and overweight) is linked to a number of non-communicable diseases, including hypertension, diabetes, cancer, and cardiovascular disease ( Ni Mhurchu et al., 2004; Berrington et al., 2010; Zheng et al., 2012). Females are more likely to be underweight, overweight, or obese than their male partners due to biological and behavioral differences. Women with insufficient nutrients suffer from infertility, abortion, preterm birth and neonatal mortality. 1.2 Women Nutrition Woman plays an important role in the society. They form a major part of our society. As per 2011 census, the total population of India is 1.2 billion out of which 655.8 million are males and 614.4 millions are females and out of that West Bengal state contents 54 million women population. As women constitute half of its population and play crucial role in different field of society like agriculture and livestock production, household economy and reproductive functions. In view of all these India's first Prime Minister rightly said that "You can tell the condition of a nation by looking at the status of women." Indian women have high mortality rates during their childhood and in reproductive years. From a global perspective, NFHS-3 data, India accounts for 19% off all live birth and 27% of all maternal deaths. India has highest proportion of malnourished women compared to other developing countries. A recent estimate suggests that about 70% of non pregnant women and

75% of pregnant women aged 15-49 years were anemic (Masson et al., 2005). Researchers discovered that Indian women's contributions to society are usually underestimated because they are viewed as economic burden. There is a great desire in Indian society for sons over daughters. Daughters are mistreated as a result of this son preference and exorbitant dowry cost. Assessment of nutritional status of women still remains a low priority in the public health agenda of most developing countries. Maternal nutritional status is important for a host of reasons. These reasons include: a) For the woman herself b) For her capacity to reproduce c) For the development of her children, with implications for the health and reproductive capacity of the next generation's mothers. However, for decades, issues in women's nutrition have focussed on nutritional assessment during pregnancy and lactation. The health and well-being of the children has thus been a major source of worry. Women's dietary difficulties have rarely been investigated, and there are few nutritional data available from non-pregnant women. India has developed a framework of programmes to combat undernutrition in recent decades, including a Public Distribution System (PDS), an Integrated Child Development Services (ICDS) programme, a National Mid-day Meals Program (NMMP), and several employment schemes that provide food in

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## LIST OF ABBREVIATIONS

| | |
|---|---|
| AFI | Arm Fat Index |
| ANOVA | One-Way Analysis of Variance |
| AWC | Adaptations of Water low's Classification |
| BAI | Body Adiposity Index |
| BMI | Body Mass Index |
| BSF | Bicep Skin Fold |
| CED | Chronic Energy Deficiency |
| CI | Conicity Index |
| CVD | Cardiovascular Diseases |
| FFM | Fat Free Mass |
| FFMI | Far Free Mass Index |
| FM | Fat Mass |
| FMI | Fat Mass Index |
| HC | Hip Circumference |
| ICDS | Integrated Child Development System |
| LBW | low Birth Weight |
| MUAC | Mid Upper Arm Circumferences |
| NCBI | National Center for Biotechnology |
| NFHS | National Family Health Survey |
| NIH | National Institutes of Health |
| NLM | National Library of Medicine |
| NMMP | National Mid-day Meals Program |
| NNMB | National Nutrition Monitoring Bureau |

| | |
|---|---|
| PBF | Percent Body Fat |
| PDS | Public Distribution System |
| PEM | Protein Energy Malnutrition |
| RI | Rohrer Index |
| SES | Socio Economic Status |
| SISF | Supra-iliac Skin Fold |
| SSF | Sub-Scapular Skin Fold |
| TEM | Technical Error of Measurements |
| TSF | Triceps Skin Fold |
| UAMAH | Upper Arm Muscle Area by Height |
| UFA | Upper Arm Fat Area |
| UMA | Upper Arm Muscle Area |
| UNICEF | United Nations Children's Fund |
| WC | Waist Circumference |
| WHO | World Health Organizations |
| WHR | Waist Hip Ratio |
| WHtR | Waist Height Ratio |

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