CHAPTER 1

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Background of the Study

Development in the early years plays a significant role as it sets foundation for health, behavior and lifelong learning.[1,2] Child's development during the first three years of life is very crucial as they grow rapidly during these years (WHO,2003).[3] Growth periods in child development can be categorized into following phases: intrauterine, infancy, childhood and adolescent. Every phase has its own typical patterns and explicit mechanisms that regulate the growth of a child.[4] Growth, is not only a typical characteristic of childhood period but is also a sensitive indicator of child's nutritional status.[5] Nutrition plays a significant part in versatile development of the children (physical, mental and emotional) specifically during formative period of child's life.[6]

Good nutrition in the early phase of the life of children is very essential as it directly has an impact on their growth and development throughout their childhood period.[7] A thorough assessment of nutritional status lays the foundation for nutrition care of children.[8] Nutritional status of child is determined in terms of anthropometric measurements i.e., Weight for Age (underweight), Weight for Height (wasting) and Height for Age (stunting).[9] A child's indices falling below –2 z-score is indicative of poor nutrition as per National Center for Health Statistics reference.[10]

Yet many children today do not get adequate nutrition to meet the requirements of body leading to undernutrition or malnutrition. Undernutrition or malnutrition is "a state wherein adequate nutrients are not delivered to the cells to

provide the substrate for optimal functioning." Protein energy malnutrition is one of the forms of malnutrition. Malnutrition is considered or said to be one of the most serious problems worldwide as it is the third rank disease causing 3.5 million deaths per year in children below five years of age.[11]

Globally (2020), 149 million children below five years of age were found to be stunted and 45 million as wasted.[12] Annually, about 2.7 million children are estimated to die due to undernutrition and about 45% children under the age of three years are reported to die due to malnutrition.[13] Hence, the problem of malnutrition is of serious concern.[14]

Malnutrition remains one of the major public health concerns in developing countries.[15-17] It is also one of the commonest causes for morbidity and mortality in children below the age of five years worldwide.[18] Each year more than ten million children under five years of age die from illnesses that can be prevented and treated.[19] Even though there are effective interventions available half of these deaths are due to malnutrition.[20] It decreases the immunity of child thereby predisposing him opportunistic infections and common childhood illnesses i.e., diarrhea and upper respiratory tract infections, other environmental exposures, exposure chronic illness and neglect.[21-23] Even if the child survives these, due to frequent health related illness their nutritional status is affected, thus binding them to the viscous circle of recurring illness which not only falters their growth but also diminishes their learning capacity.[24] In Southern Asia, this burden of malnutrition is much bigger when compared to the other parts of the world.[25] This double burden existence has now been recognized as global trend.[26-30] In South Asia, the prevalence of underweight and stunting is 46% and 44% respectively.[31]

In India, about 2/3rd under five children is malnourished of which 5-8% are severely malnourished and rest are mild to moderately malnourished.[32,33] In world, about 80% of the undernourished children are living in 20 countries and India has about 60 million children underweight.[34] Hence, malnutrition is one of the most prevalent and widespread problem affecting the child's health.

Inspite of program assurances since 1975, like ICDS, National School Lunch Programs, our country i.e., India is still grappling with high proportion of malnutrition.[35-37] According to data by National Family Health Survey-5, the rate of stunting in India is still high, though there has been an improvement over the years. As per 2019-21 data, about 35.5% children below five years of age were stunted and 32.1% children were found underweight. On Human Capital Index, India ranked 116 out of 176 countries.[38]

Malnutrition occurs from combination of inadequate dietary intake and infections which lead to nutrient and energy loss. Wasting occurs due to acute malnutrition and stunting results due to long term adversity.[39] There are various other causes of malnutrition and they all are multifaced. They intervene with each other and are also hierarchically related. As mentioned already poor diet and disease are most immediate causes of malnutrition. The other factors like: food scarcity, maternal, and child rearing practices, health services accessibility and healthy environment and household income also influences the nutritional status of children.[40,41]

In India, about 75% population lives in villages, and about 50% of which has a socio-economic status of below poverty line. Most of the children do not get adequate nutrition as most of their families have low socio-economic status. A

substantial percentage of these children live in deprived socio-economic environment i.e., poverty, poor environmental sanitation, ailments, infections, inadequacy to basic health services, improper child feeding and caring practices thereby leading to impediment in physical and mental development.[42]

Apart from above mentioned factors, another important factor which directly affects child's nutritional status is mother's knowledge and rearing practices that she adopts for her child.[43-45] Mother is the principal care provider for her child during initial period of their life. This basic care that she provides for her child depends largely on her awareness and understanding of basic concepts of nutrition and health for her child.[46]

Appropriate application of knowledge and skill learned from any sources or related information on nutrition is expected to improve knowledge and practice related to care of children which thereby also improves nutritional status of children. There are very few or limited studies/ researches highlighting the effect of nutrition education on mothers who do not have any form of basic education. Knowledge, awareness and skill influences people's practice and behavior. Also, families with similar socio-economic status and accessibility to resources also have variations in nutritional status of their children.[47-49] This shows that factors other than resources are more responsible for nutritional related problems in children. Appropriate child care practices during initial phase of child's life are an important factor for his ideal growth. Caregivers' behavior provides conducive environment to children which plays a central role in good nutritional outcomes as suggested by International Conference on Nutrition.[50]

Need for the Study

Childhood phase is a significant period of human life. Nutrition adequacy is important for both physical and mental development functioning for a growing body.[51-53] Inadequacy in nutrition leads to malnutrition, which is the most common health problem occurring in children below the age of five years.

There is no country in the world that has not witnessed the problem of malnutrition; it is persisting and is of rising concern. About 159 million and 50 million children under-five years are stunted and wasted (WHO,2020). There are many factors of malnutrition like inadequate breast feeding, lack of accessibility to nutritious food and infections.[54]

More than ten million under-five children all over the world and even more die from the diseases which can be prevented and treated at early stages. [55-57] Among this malnutrition is accountable for half of these deaths. Developmental delay, impaired cognitive, motor and physical development, and poor cognitive performance, low IQ, poor social skills, vulnerability to diseases and more behavioral problems in children are consequences of long-term malnutrition in children. Globally, malnutrition rate is admissibly very high and the steps to eradicate it are poorly impleted.[58]

In sub-Saharan Africa and South Asian countries, malnutrition in children is still one of the gravest health problems.[59] About 3.1 million children per annum are estimated to die due to undernourishment either directly or indirectly.[60] Malnutrition in very young children (0-8) years can be more disastrous and permanent as it can lead to delay in physical growth and motor development. It can also hinder behavioral and cognitive development, deteriorate learning ability, retard educational

attainment, affects social skills, attention and reproductive health, thereby diminishing future working productivity in children. The damage occurred is irreversible. A malnourished child will never be able to learn or work with the same capacity as he would have done if he was adequately nourished. Undernutrition has long and lasting effect on child and can diminish the competence and strength of future generations of our society.[61] Data shows that the malnutrition is significantly high in South Asian and African countries than others countries worldwide.[62] It has affected about 165 million children with chronic restriction of growth.[63]

As per UNICEF (2015) reports, about six million child deaths which can be prevented occur every year in developing countries but unfortunately this is just a small data about existing condition. About 200 million children are unable to attain their expected cognitive development due to inadequate nutrition and poor health. Undetected severe undernutrition challenges survival, growth and development of children and also diminishes their strength and capacity.[64]

A study was done to identify the influence of socio-economic factors on status of nutrition in children of urban areas in Nigeria. The prevalence identified for underweight, stunting and wasting was 23.1%, 9% and 26.7%.[65] Another study done among under-five children of farming households of Nigeria showed that about 23.6%, 22% and 14.2% children were stunted, underweight and wasted.[66] A comparable study conducted in pre-school children of rural community Kenya reported that stunting, underweight, and wasting prevalence was 30%, 20% and 4% respectively.[67]

In India, the condition of malnutrition is very poor and it is underlying cause for mortality and developmental challenges.[68] In India, the prevalence of

malnutrition is highest in the world, double than sub-Saharan Africa, with dire consequences of morbidity, mortality, economic growth, and productivity. Though undernutrition level in India has reduced slightly since 1990s but when compared to other countries with similar economic rates it is lagging far behind.[69]

Sapkota & Gurung reported in their study done in Nepal that poor socio-economic condition was one of the risk factors associated with stunting and underweight. Children brought up in extended families were unlikely to be stunted than those raised in nuclear families. Other factors like age of mother during pregnancy and ethnic group she belongs to had significant association with stunting.[70] Another study done in Sudan-Alrawakeeb valley reported that mother's education is associated with malnutrition in children below five years.[71]

A cross-sectional study by Akhade & Sankhe was done in urban slums of Delhi with the objective to assess the role of epidemiological and maternal factors on nutritional status of children. About 400 under-five children with their mothers were selected from ten slums randomly. It was found that 39.8%, 36.5% and 24.8% children were underweight, stunted, and wasted. Factors found to be significantly associated with underweight were: family size (p = 0.02, χ^2 = 7.7), breast feeding initiation (p = 0.0009, χ^2 = 6.8), education status of mother (p = 0.001, χ^2 = 13.9), malnourished mother (p = 0.05, χ^2 = 4.8) and mother's dietary status (p = 0.03, χ^2 = 6.5). Other factors like child's age (p = 0.001, χ^2 = 18.1), birth weight p = 0.006, χ^2 = 7.6) and not taking medical advice (p = 0.03, χ^2 = 7.0) were associated with stunting whereas immunization (p = 0.05, χ^2 = 3.5), education of mother (p = 0.002, χ^2 = 612.4), mother's occupation (p = 0.02, χ^2 = 4.9) and malnourished mother (p = 0.05, χ^2 = 5.3) were associated with wasting.[72]

Another cross-sectional study done in Mehrauli area of South Delhi among under-five children found that prevalence of underweight and stunting was 34% and 42.6% respectively in 520 children selected by systematic sampling. The factors identified to be associated with underweight and stunting were: fathers' education ($p < 0.05$), mothers' education ($p < 0.05$), poverty ($p < 0.05$) and exclusive breast feeding ($p < 0.05$) as reported by Dabar et al.[73]

To solve the problem of malnutrition which is present since pre-independence era and other problems relating to nutrition like overweight, effects on health and its risk factors, a thorough planning is required at ground level to identify the root cause instead of solving it superficially. Most of the times, faulty food habits, religious vibes, poor knowledge and other factors are responsible for these nutritional problems in children. Most of these problems can be rectified through awareness programs or education regarding diet in under-five children.

There is an extreme shortage of health care providers in developing countries.[74] Thus, health care services at primary level are usually not given much importance. Due to a smaller number of health care centers in nearby locality most of the people neglect health and access the hospital only when health status becomes serious or disease aggravates. Health care workers tends to give more importance to serious cases thereby preventive aspect e.g., health education on health care often gets neglected.[75]

Hence, to combat this issue it is essential to have an intervention which is not only effective but also is reachable, feasible, culturally acceptable and can also be combined with local health services. Such intervention can be led by training the representatives of community and other members who can provide appropriate

nutrition related education to primary care givers and family members which will help to improve nutrition in children.[76,77]

Inspite of government-initiated programs to solve the problem of malnutrition its prevalence rate is still soaring high in the hilly terrains. A study done by Vyas et al. in state of Uttarakhand reported the prevalence of malnutrition in children below five years as 61.78%.[77] Another study by Rehan et al. reported that underweight, stunting and wasting was 37.3%, 43.3% and 24.5% in Rishikesh, Uttarakhand.[78] This data was found to be on a higher side when compared with NFHS-4 data of Uttarakhand which found that underweight, stunting and wasting prevalence was 26.35%, 33.5% and 19.5% respectively.[79] Therefore, it directly points to the need for unearthing the factors which are responsible for malnutrition.

Exploration of the risk factors will further provide a platform to develop a need-based intervention program for mothers of the under five children. Nutritional status of child is also associated directly with mothers' knowledge and rearing practices. Thus, an intervention which focuses on improving mothers' knowledge and related practices towards maintaining optimum level of nutrition in children will be helpful. This will also help to decrease the proportion of malnutrition in children under-five years of age. The need for an intervention has also been highlighted by a study done by Vyas et al.[77]

Thus, this study will explore the risk factors of malnutrition and develop a need-based intervention program for the mothers of children below five years with the goal to improve nutritional status of under-five children.

Research Statement

A study on risk factors of malnutrition and effectiveness of family-based intervention program (FBIP) on nutritional status of children and knowledge and practices of mothers in selected villages of Nainital district, Uttarakhand.

Purposes

The purpose was to identify nutritional status, explore the risk factors related to malnutrition and to develop need-based Family-Based Intervention Program (FBIP) to improve the nutritional status of children aged 1-3 years. It also aimed to identify its effectiveness on nutritional status of children, nutritional knowledge and nutrition related practices of their mothers.

Objectives of the Study

Phase I

1. Assess the nutritional status of under-five children in selected villages of Nainital district, Uttarakhand.
2. Explore the risk factors of malnutrition in under-five children.
3. Find the relationship between the nutritional status of under-five children and selected variables.

Phase II

4. Assess the nutritional knowledge of mothers of under-five children.
5. Assess the nutrition related practices of mothers of under-five children.
6. Develop Family Based Intervention Program (FBIP) to improve the nutritional status of children.

7. Evaluate the effectiveness of FBIP on nutritional status of under-five children.
8. Evaluate the effectiveness of FBIP on nutritional knowledge among mothers of under-five children.
9. Evaluate the effectiveness of FBIP on nutrition related practices among mothers of under-five children.

Research Variables

- Independent variable: Family-Based Intervention Program (FBIP)
- Dependent Variables:
    1. Nutritional status of under-five children
    2. Nutritional knowledge among mothers of under-five children
    3. Nutrition related practices among mothers of under-five children
- Socio demographic variables: Age, Gender, Mother's age, Marital Status, Mother's and Father's education, Mother's and Father's occupation, Religion, Family Type, Siblings, Type of diet, Place of delivery, Access to health facilities and Aganwadi Services

Hypotheses

The hypothesis was tested at 0.05 level of significance.

H_1: The mean pre-test–post-test difference of the scores of Nutritional status will be significantly higher in the intervention group than control group.

H_2: The mean pre-test–post-test difference of the scores of Nutritional knowledge will be significantly higher in the intervention group than control group.

H_3: There will be significant improvement in the means of post-test nutrition related

practice scores in intervention group than control group.

Assumptions

The study assumes that:

1. Nutrition related problems are common among children.
2. Nutritional status of the under-five children may vary among the population.
3. Nutritional status of children may be influenced by various factors like socio-economic, education and occupation of parents, knowledge and practices of mothers.
4. Selected demographic variables i.e., (Gender, Mother's Educational status, Family Type, No. of children and Place of delivery) have influence on mothers' knowledge and practice regarding prevention and management of malnutrition.
5. Knowledge and practice of mothers of the children may vary among the population.
6. Mothers' responses to the semi-structured knowledge questionnaire will reflect their knowledge about management of nutrition in them under-five children.
7. Mothers' will be providing correct response to questions on nutritional related practices.
8. Mothers' play an important role in maintaining nutritional status of their children.
9. Sample size is true representation of the population.

Operational Definitions

Nutritional Status: In this study nutritional status refers to level of nourishment of the under-five children in terms of weight in kilo grams as measured by weighing

scale, height in centimetres (cm) as measured by inch tape and interpreted as *underweight (low weight for age), stunting (low height for age) and wasting (low weight for height)* as per WHO Anthro software.[80] Nutritional status was also assessed by measuring mid upper arm circumference in cm using Shakir Tape and was interpreted as *Normal (Above 12.5 cm), Mild to Moderate underweight (11.5 - 12.5 cm) and Severe Acute Malnutrition (Below 11.5)* as per UNICEF guidelines.[81]

Risk factors related to malnutrition: In this study it refers to the factors contributing to or associated with malnutrition among under-five children which includes child care characteristics, environmental characteristics and morbidity related characteristics as measured by semi-structured questionnaire. It also includes risk factors explored through focused group discussions and in-depth interviews among mothers of under-five children identified with malnutrition.

Nutritional Knowledge: In present study, it is awareness of mothers of identified malnourished children regarding concept of nutrition, child's nutritional needs, balanced diet, common deficiency diseases, its prevention and nutritional services available as measured by structured knowledge questionnaire.

Nutrition related Practices: In the present study, it refers to factors which may directly and indirectly influence the nutritional status of the child which includes factors like dietary practices, hygienic practices, cooking practices and utilization of health services by mothers of under-five children and will be measured by structured questionnaire.

Under-five children: In the present study, under-five children are the children in the age group of one to three years and residing in selected villages of Nainital district, Uttarakhand.

Mothers: In the present study, it refers to mothers of children aged 1-3 years identified as malnourished in selected villages of Nainital district, Uttarakhand.

Effectiveness: In the present study, it refers to the ability of FBIP in improving nutritional status of children as measured by difference between pre-test and post-test scores of knowledge, nutrition related practices of mothers, and nutritional status of children.

Family based intervention program (FBIP): In this study, it refers to multi-component training program focusing on improving nutritional status of children which was developed by investigator based on need assessment survey conducted among of under-five children and their mothers.

Conceptual Framework

Conceptual framework lays the foundation of how researcher wants to explain the phenomenon. It can be explained either in written or visual form. The framework designed by the researcher explains graphically the key components, concepts or variables under the study or are to be studied. It explains the presumed relationship among them.[82]

The present study focuses on identification of factors relating to malnutrition in children below three years and aims to improve the nutritional status of children. This will be done by helping the mothers and family to improve their knowledge and practice relating to nutrition through family-based intervention program. Thus, for the present study, Weidenbach's helping art of clinical nursing model published in 1969[83] was selected to develop conceptual framework. (Fig. 1)

According to Wiedenbach, nursing is identifying the patient's need for

assistance by observing the presenting signs and symptoms. In her theory it refers to caring for a person in need in motherly fashion which can be provided by sympathy, skill and understanding. She proposed that nurse should identify the need for help by observing the presenting behaviors, exploring the meaning of the behavior, determining the cause and determining whether they are able to solve their problems by themselves or they need help. If need is required then nurse implements a plan based on the needs and requirements of patient.[84,85]

Her theory consisted of four elements: philosophy, purpose, practice and art. According to her, philosophy referred to attitude of nurses towards life and reality which evolves from their ability to think, act and make decisions based on the purpose. Purpose means what she wants to achieve through what she does and included major units of nursing practice. Practice (nursing practice) includes identification of individual's needs for help, ministration of needed help and validation that help given was the needed help. Clinical nursing art consisted of: nurses understanding of status of patient, condition and need; nurse's goals and activities directed to improve condition of patient and interventions aiming for prevention of future relapse of problem.

Prescriptive theory is another component of this theory. It refers to steps that nurse thinks are appropriate to fulfill the main purpose. It is based on three factors: central purpose, prescription and realties. Realities refers to the immediate situation which influences the central goal. The realities included were: agent, recipient, goal,

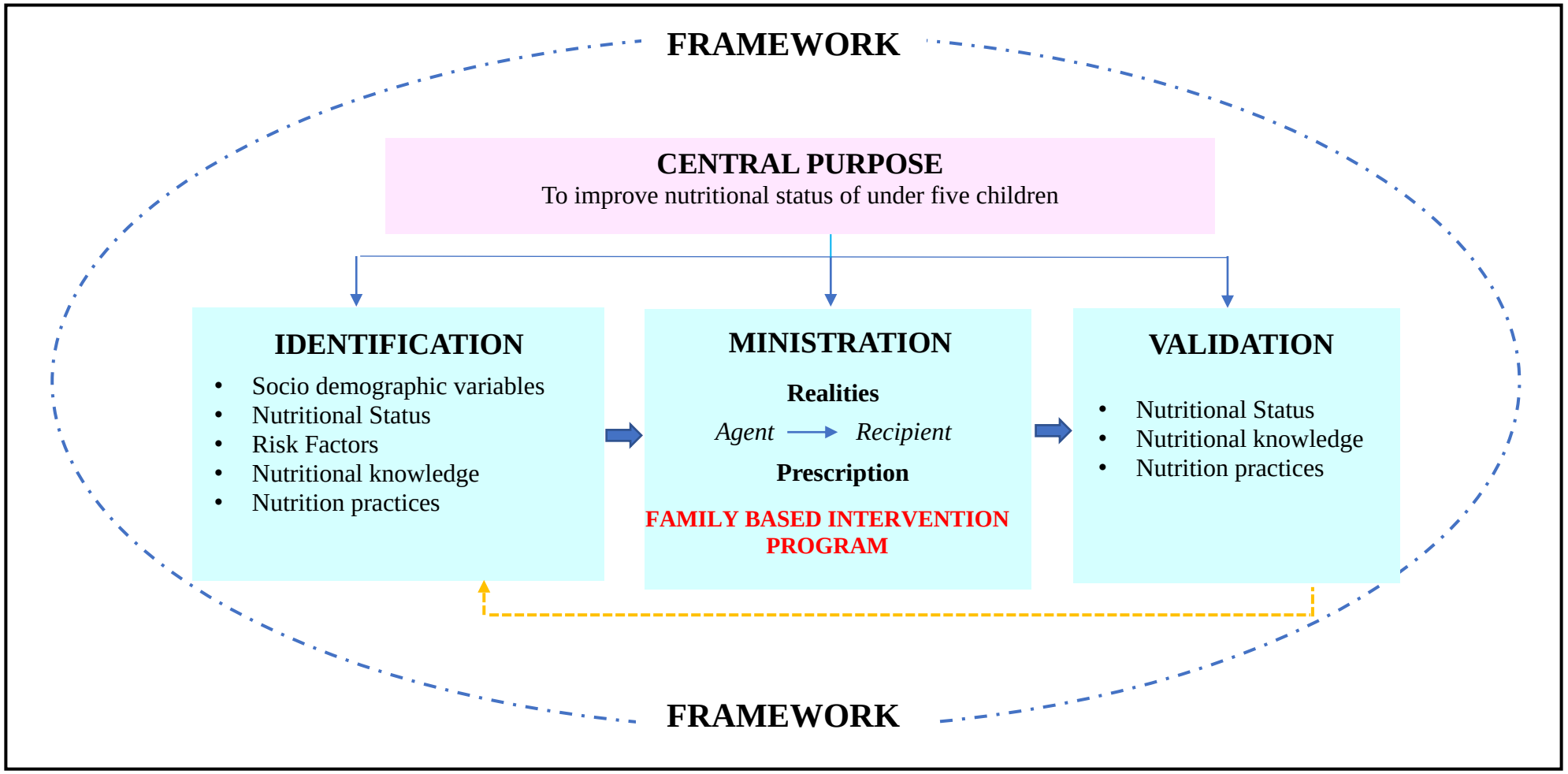

Fig. 1: Conceptual framework of the study developed based on "A helping art of Clinical Nursing Model" by Wiedenbach

means and framework. Agent referred to the professional nurse or her representative. Recipient is the patient with problems. Goal is the expected outcome. Means are those steps or strategies nurses use to attain the central purpose and framework refers to the environment.

Hence, the conceptual framework used for this study is based on the concept of helping the mothers of children aged 1-3 years to improve their knowledge regarding identifying nutritional need for their children and develop good nutrition related practices for them. This will thereby improve the nutritional status of children and prevent them from undernutrition and opportunistic infections in future.

Central Purpose: In the present study, the central purpose is improvement in the nutritional status of identified malnourished children aged 1-3 years after administration of family-based intervention program.

Practice & Art: In the present study, practice and art refers to the steps used in order to attain the goal as described below:

Step I: Identification for need for help

In this study, need was identified through anthropometric assessment of children aged 1-3 years i.e., weight, height and mid upper arm circumference for nutritional status. Followed by which factors for malnutrition was explored by interviewing mothers of identified malnourished children via semi structured questionnaire. Further focused group discussion was done among mothers to know their perception for factors relating to malnutrition in their children. Knowledge and nutrition practices of mothers was also assessed with a questionnaire. This helped to developed a Family-Based Intervention Program after identification of need for

mothers and other family mothers of identified malnourished children in intervention group. Routine care was given to control group and after completion of study intervention was delivered to waitlist control group.

Step II- Ministration of the needed help

In the present study, Family-Based Intervention Program (FBIP) was given to the intervention group (mother and family of identified malnourished children) and later to control group.

Step III- Validation

In this study validation was done by the researcher by doing posttest in mothers of intervention and control group at 1st month and 3rd month. Knowledge was interpreted as good, average and poor. Nutrition related practices was interpreted as appropriate practice, moderately appropriate practice and inappropriate practice. This helped the researcher to know the mean enhancement of knowledge and practice scores. Further, assessment of weight, height and mid upper arm circumference was done in children aged 1-3 years for both intervention and control group at 3rd month, 6th month and 9th month. This will be validated by checking for enhancement in weight, height and MUAC in children.

Realities

Agent: In the present study, researcher acts as an agent who will be identifying and deliver the intervention to the group.

Recipient: In the present study, children aged 1-3 years identified as malnourished and their mothers are recipients.

Means: In this study, it refers to the methods used by the researcher to deliver the

Family-Based Intervention Program (FBIP). The intervention was delivered to mothers and families of identified malnourished children by: lecture cum discussion sessions, demonstration and re-demonstrations, collection of dietary patterns of children three-day dietary recall and dietary counselling of mothers done after analyzing the diet related through Diet-Cal software, demonstration of food recipes, distribution of nutrition calendar, diet recipe booklet, information booklet to mothers and poster to children.

Framework: In this study, it refers to selected community area (villages) in Nainital district, Uttarakhand.

The conceptual framework based on the Wiedenbach model assisted the investigator to define the purpose of the study. It also guided for the identification of needs, developing and administration intervention and validation of the intervention.

Delimitations

1. Children in the age group of one to three years in selected areas of Nainital district.
2. Children who are identified as malnourished: underweight, stunting and wasting.
3. Evaluation of effectiveness of FBIP is delimited to children with mild and moderate malnourished identified children.

Chapter Summary

The data mentioned in the above literature highlights the problem of malnutrition in our country. The data discussed showed that the prevalence is high in children below five years. Though various government imitated programs are running in Uttarakhand and India but it has not reduced much. It has been emphasized in the literature mentioned above that there should be community awareness intervention programs at their setting based on geographical setting, cultures and ethnic practice of particular community. This will be more effective than distributing ready to use therapeutic food which is just temporary. This chapter has discussed about the background and need for the study. It included research statement, objectives, hypothesis, assumptions, variables, operational definitions, conceptual framework, and delimitations of the study.