



EXAMINATION OF THE EFFECTS OF CHILDHOOD OBESITY ON STUDENTS

A Literature Study

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<p>Abstract</p> <p>Background. Childhood overweight and obesity are among the world's most serious health issues among school going children in the contemporary world. The WHO estimates show that the number of overweight children under five years in 2015 stood at more than 42 million in 2015. The health risks associated with this global trend have been shown to be significant and wide-ranging. Overweight and obese children suffer from health risk factors including endocrine, gastroenterological, pulmonary, neurological, and orthopedic conditions.</p> <p>Method. In this research, the researcher undertakes an evaluation of secondary data sources in order to identify the health impacts of childhood obesity on school going children, as well the nursing interventions in such health consequences. The inductive content analysis was then utilized in analyzing the most relevant secondary data sources with the objective of quantifying emerging concepts and characteristics.</p> <p>Results. The study established that childhood obesity has a significant impact on the psychological and physical health status of school going children. Most of the physical consequences of childhood obesity were found to include issues such as impaired insulin sensitivity, cardiovascular diseases, kidney, type two diabetic, colorectal, and esophageal cancers as well as hypertension. Psychological consequences included bullying in school; poor academic performance, depression, and low self-image were also seen to affect obese and overweight children. The study, however, found that these consequences are preventable and treatable. Healthcare professionals such as school nurses were found to play an important role in the health consequences of childhood obesity among school-going children.</p> <p>Conclusion. The study supports earlier findings identifying childhood obesity to be an intricate disorder that negatively affects school going children. It has significant impacts on both the psychological and physical health status of school-going children.</p>	
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1. INTRODUCTION

Obesity in children has been found to be one of the world's most serious health issues among school going children (WHO, 2016). The phenomenon, defined as the excessive or abnormal accumulation of fat that may damage health, has been documented to be on the rise both among the youths and adults (Mokdad et al., 2003), (Flegal et al., 2010), (WHO, 2016). According to recent projections, the occurrence of obesity (body-mass index (hereafter BMI) >95th percentile for gender and age) is 15.3% in 6-to-11-year-old children and 10.4% among children between 2 and 5 years. These estimates are an increment as the number stood at 11% and 7% respectively between 1988 and 1994 (Ogden et al., 1997). The WHO estimates show that the number of obese children under five years in 2015 stood at more than 42 million in 2015 (WHO, 2016).

The health risks associated with this global trend have been shown to be significant and wide-ranging. Overweight and obese children suffer from health risk factors including endocrine, gastroenterological, pulmonary, neurological, and orthopedic conditions (Must & Strauss, 1999). These health issues are not only the costs of childhood obesity. It has also been found that the emotional and physical consequences of obesity also negatively affect children's school performance (Falkner et al., 2001). Most of the obese children eat foods that are rich in sugar and fat rather than sticking to a healthy diet. The stigma associated with being obese lowers the self-esteem of children and adolescents. A small-scale study involving a sample of 106 obese children between the ages of 5 and 18 established that obese students were often subjected to ostracism and teasing and that they reported to having problems keeping up with their peers, both academically and physically (Greenbett, 2003). The teasing and ostracism may lead to depression which in itself may lead to health issues such as hypertension.

Childhood obesity can, however, be prevented (Daniels, 2006). Studies have shown that preventive interventions are critical in reducing the number of hypokinetic conditions, enhance the methods to motivate students to be physically active and assess the efficacy of the program. Tracking studies have however shown that it is difficult to develop and sustain a healthy behavior throughout one's life. (Whitaker & Dietz, 1998) These findings notwithstanding, children have to be encouraged to eat less and be physically active. Family and school-based interventions have to be oriented towards prevention by targeting all children to avoid stigmatization. The interventions should aim at reducing dietary fat consumption, the increment

of the consumption of fruits and vegetables, limits to TV time and promotion of vigorous physical activity.

More data on the perceptions of an obese child and his or her parents is required in enhancing and maximizing on future behavioral family lifestyle intervention programs. As such this study aspires to contribute to the growing body of literature on the impacts of childhood obesity on students' health. The paper aspires to provide an insight into the health implications of childhood obesity with a view to reducing the phenomenon. To this extent the researcher also examines the school nurses' intervention that can be used to prevent these effects. The author aims to consolidate all information that has been put forward by other researchers in order to come up with a more comprehensive unit for use in the healthcare practice. The research will review what others have said about the effects of childhood obesity in order to identify any gaps that need to be filled by the current research.

Significance of the Research

School going children need to be healthy in order for them to concentrate in schools and to better perform in their academic work. Parents and school nurses' ought to ensure that their children are healthy and protected against the health consequences of obesity and being overweight. One way of keeping children healthy is by encouraging them to engage in vigorous physical activities and eat lots of fruits and vegetables. This research will be instrumental in helping governments and policymakers in understanding the health effects and the best way to eradicate childhood obesity among school going children. The findings and suggestions will also help of school boards and policy makers in coming up with better and sustainable policies that guarantee the eradication of childhood obesity. The outcome of the research will aid other scholars and researchers in getting more information on childhood obesity and its health impact on school going children.

2 BACKGROUND

The frequency with which children become obese and overweight has increased globally in recent past. Historically, fat youths were alleged to be healthy and capable of surviving the rigors of infection and undernourishment, and the notion that “huge is better” was globally accepted. Presently this baseless misperception has considerably changed owing to the growing literature indicating that childhood obesity is related to a great number of critical health conditions and a heightened probability of premature sickness and death (Figueroa-Munoz, Chinn, & Rona, 2001).

2.1 The Epidemic of Overweight Children

Definitions of obesity in school going children differ significantly between epidemiological researchers, making it difficult to compare cross-sectional frequency data. However, some researchers have assessed changes in frequency within people over time, in which they have come up with astounding outcomes. Prevalence levels have gone up 3.3-fold over the last two and half decades in the USA, 2.8-fold over the last decade in the UK and 3.9-fold over the last eighteen years in Egypt (US National Center for Human Statistics, 2002). Distributions of BMI have shifted in such a way that the biggest school kids, at the highest risk of complications, have become fatter. The pandemic has influenced a wider age group, most ethnic groups, and populations of every economic status. The global phenomenon has increased among the urban poor in most developed countries due to lack of properly balanced diet as well as lack of vigorous physical exercise (Gordon-Larsen, McMurray, & Popkin, 2000). Conversely, overweight children are most prevalent among the upper socioeconomic strata in most developing nations largely due to the embracing of western lifestyle (Popkin, 2002).

2.2 Causes of Obesity in Children

Body weight is controlled by many physiological types of machinery that sustain the equilibrium between energy expenditure and energy intake (Lustig, 2001). The control mechanisms are extremely exact under normal situations, for instance, a positive stability of only 100 Kj (24 kcal) daily would provide a 10-kg increase in body mass in a span of ten years. Therefore, any aspect that increases the intake of energy or reduces energy consumption by any quantity will result in obesity or be overweight in the long run. Genetic issues have a huge effect on individual

predispositions, but the increasing frequency rates within genetically stable children show that perinatal and environmental factors underlie obesity among school going children.

According to (Whitaker & Dietz, 1998) hypothesis, childhood obesity may be caused by prenatal overnutrition. The two researchers asserted that maternal obesity heightens the transfer rate of nutrients across the mother's placenta inducing lifelong changes in energy metabolism, neuroendocrine functioning, or appetite. Other studies have buttressed the findings by observing that maternal obesity, birth weight and obesity later in life are directly linked (Whitaker & Dietz, 1998).

A lifestyle lacking physical activity may also cause childhood obesity. Findings by (Trost et al., 2001) assert that students who spend less time in vigorous activities tend to have increased chances of becoming obese. Those who spend most of their time watching TV rather than engaging in moderate-to-vigorous physical exercises are thought to gain weight. These passive children consume lots of energy-rich foods while watching TV which also increases the likelihood of becoming overweight.

Family factors also play an enabling role when it comes to childhood obesity. Parents who prefer eating at restaurants have their children consume more energy compared to those who eat at home. Also, social support from family members also has been seen to strongly correlate with participation in physical activities which reduce the likelihood of becoming obese (Sallis, Prochaska, & Taylor, 2000).

2.3 Relationship between Childhood Obesity and Student Health

Childhood obesity is known to negatively affect students' health (Bradford, 2009). Obesity is a health condition with devastating consequences (Strauss, Bradley , & Brolin, 2001) ; (Srinivasan et al., 2002); (Tounian et al., 2001). As is the case with adults, childhood obesity results in hyperinsulinemia, endothelial dysfunction, increased blood clotting, chronic inflammation, dyslipidemia, and hypertension (Ford et al., 2001). The clustering of cardiovascular disease risk factors also referred to as insulin resistance syndrome has been recognized in children below the age of five. In young adults and adolescents who have died because of traumatic factors, the availability of insulin resistance syndrome correlated asymptomatic coronary atherosclerosis and lesions (McGee et al., 2002). Moreover, in the UK, overweight children had an increased risk of

dying due to ischemic heart diseases in adulthood 2-fold in fifty-seven years (Gunnell et al., 1998).

Type II diabetes which has for long been unrecognized among children now accounts for half of all the diagnosis of diabetes in several populations. The disease is fully a consequence of pediatric obesity in which lifestyle and hereditary factors influence personal risk. Obese children have also been identified to be at the risk of frequent pulmonary conditions such as asthma, sleep apnea, and exercise (Figueroa-Munoz, Chinn, & Rona, 2001). These pulmonary complications do limit the physical activities of children and further exacerbate the weight problem. Other serious neurological, musculoskeletal, renal and hepatic conditions have been increasingly identified among children (Goulding et al., 2001).

In addition to the health consequences of childhood obesity, other studies have also found a negative correlation between childhood obesity and school performance. In their study, for instance, (Wu et al., 2017) discovered a close association between childhood obesity and poor academic performance among Chinese school-going children. Analyzing data on this study helped the researchers conclude that obese children have working memory deficits which may be construed to the cause of poor performance (Wu et al., 2017). This study is supported by (Heshmat et al., 2014) who found a negative relationship between school performance and childhood obesity. Those who were overweight were seen to have low scores as compared to normal school going children. The relationship was seen to be more significant for geometry and mathematics (Heshmat et al., 2014). Psychological factors such as poor self-image and altered peer relationships have been suggested to influence the relationship between school performance and obesity (Wu et al., 2017).

2.4 Prevention and Treatment

Preventive interventions are critical in reducing the number of hypokinetic conditions, enhance the methods to motivate students to be physically active and assess the efficacy of the program. Tracking studies have however shown that it is difficult to develop and sustain a healthy behavior throughout one's life (Bradford, 2009). These findings notwithstanding, children have to be encouraged to eat less and be physically active. Family and school-based interventions have to be oriented towards prevention by targeting all children to avoid stigmatization (Ford et

al., 2001). The interventions should aim at reducing dietary fat consumption, the increment of the consumption of fruits and vegetables, limits to TV time and promotion of vigorous physical activity. Surgical treatments for obesity in children include the use of bariatric surgery which is only used in severe cases. This is because the surgical procedure involves serious complications including wound dehiscence, bowel obstruction, and perioperative mortality (Ogden et al., 1997).

3. THEORETICAL FRAMEWORK

A theoretic framework is defined as a collection of interrelated concepts, just like a theory but not specifically so well worked out. It gives guides researchers their studies, determining what things should be measured, and what statistical associations they have to look for. In this study, the author uses the Imogene Kings Theory of goal attainment that tries to champion for nurses to have effective communication with their patients, set acceptable goals and work in harmony towards the attainment of such goals. King proposes that the relationship between nurses and their clients can affect the objectives that are set and how they are accomplished (Wisniewski, 2013). King describes her theory as being a theory of nursing that deals with the phenomena referred to as process and outcomes. The outcomes are described as being in the form of objectives to be accomplished (Alligood, 2010).

3.1 Major Interacting Systems

The main interacting systems of the goal attainment theory are divided into three separate systems: social, interpersonal and personal, all of which have their own concepts (Alligood, 2010).

King stated that personal systems are the individual perceptions of oneself, body image and time which affect the manner in which he or she reacts to events and objects in his or her own life. As people develop through their lifespan, the experiences they have with changes in function and structure of their bodies over time affect the perceptions of oneself (Alligood, 2010). The idea of personal systems depends on how the patient looks, feels and thinks about themselves and involve growth and development, learning, space, time, body image, self, and perception. The concept of perception describes an awareness of the clients' experiences by profession and organizing memories to influence behavior and represent the client's interpretation of their own reality. The idea of self is dependent on the feelings and thoughts a client has towards their personal existence. "Self" entails a client's inner world, consisting commitments, experiences, ideas, beliefs, values, and attitudes that distinguish them from another person. The client's "self" describes who they are and what they are to themselves. The idea of growth and development is a permanent process of behavioral, physical, cognitive and emotional maturity to oneself, based on meaningful experiences. Body image is the idea of how a client perceives themselves, their

bodies, and the response of others to their body image. Space is the idea of physical areas expanding in all directions. The final idea of learning sums of the knowledge that is attained from the personal system (King, 1992).

Interpersonal systems

Interpersonal systems describe the interactions that occur between individuals. The interaction of two people is referred to as dyad, three people are called a triad while that of four or more people is referred to as a group (Alligood, 2010). The interaction becomes more intricate as more people get into the interaction process. An interaction between a nurse and patient must work to attain a set goal and must include the concepts of an interpersonal system: stress, role, transaction, communication, and interaction. The idea of interaction is the observation of verbal and non-verbal behavior in individuals. Communication is the process by which information is conveyed from one person to another either directly or indirectly (King, 1992). Transactions describe the interaction between the people and the environment in which they share the goals they want to attain. Role in itself is the concept of a client's obligations, rights, and behavior in a certain social status, while stress compromises a transaction of energy and information between clients and their environment to achieve an equilibrium and control of physical, mental and emotional tension.

Social systems

Social systems are described as the interactions between a nurse and a patient who share similar goal, interests, and values. They are the basis for the establishment and growth of relationships and interactions (Alligood, 2010). The social systems are a derivative of decision making, status, power, authority, and organization. Organization describes a collection of people who have defined roles which can be attained by using the available resources. Authority describes the organization of people whose backgrounds, viewpoints and values are characterized by transactional processes of reciprocal relationships that determine, approve and accept the individuals' authority. Power is the ability to achieve set goals by using the available resources and environmental forces. Individuals' lifestyle, responsibilities, and rights within an organization define status, whereas decision making is defined as the art of a group coming together in an agreement with an option of attaining a goal (Alligood, 2010).

The most significant system of the three is the interpersonal system. The social and personal systems are important in respect of the quality of care a client gets, but the interpersonal system provides a link between two strangers, usually a patient and a nurse, together for the attainment of a state of health while defining the individual roles for each party.

3.2 Propositions and Assumptions

The goal attainment theory is based on a number of assumptions and propositions. The predictive propositions include:

- Transaction occurs in a patient-nurse interaction where communication skills are available
- Effective nursing and client satisfaction are attained where the goal is accomplished.
- Improvement of growth and development take place when nurse-client interactions are made up of transactions
- Transactions can take place where role performance and expectations are satisfied by the nurse-client interaction
- Conflicts in the nurse-client roles cause stress in their interaction
- Favorable goal setting and accomplishment takes place where a nurse communicates suitable knowledge to the client
- Life's circumstances are represented by transactions in which each individual plays an active role in altering the outcome of the experience
- Individual behavior is purposeful, rational, controlling, attentive, social, action and time oriented.
- Nurses use several skills including relating, judging, thinking, and perceiving to match the behavior of the client they are given
- Nursing care for and restore patients' health or if that is not achievable help the patients experience dignified death (Alligood, 2010).

3.3 Nursing Metaparadigms

The goal attainment theory is based on four nursing paradigms which are interrelated. They include human being, health, environment, and nursing

Human being

The goal attainment theory presupposes that human beings are informed and rational. King believed that people have the capability of feeling, choosing, thinking, setting objectives, making decisions, and attaining goals (Wisniewski, 2013). She also believed that all people have similar basic needs that have to be satisfied, the need to look for health care and avert diseases, the desire for information on their well-being when required, and the desire for care whenever they are incapable of doing so themselves. In addition, the king proposed that nurses have the opportunity to establish what health information their clients need, how the patient views his or her own health, and what actions the patient takes for the maintenance of health (Wisniewski, 2013).

Health

According to King, health is a dynamic life experience of individuals, implying constant adjustment to stressing factors in the outer and inner environment through the maximum use of ones' resources to attain maximum potential for day to day living. Health, as affirmed by King herself, is not a continuum but a holistic condition which is characterized by aspects of being perpetual, functional, cultural, dynamic, relative, subjective and genetic (King, 1992). Any deviation from a person's normal functioning, relating to social relationships, psychological makeup or biological structure is described as an illness.

Environment

Environment and society are shown to be the major concepts of the goal attainment concept but are not clearly defined by Kings Work (Alligood, 2010). Society is perceived to be the social systems portion of king's conceptual systems. According to king environment is a function of the balance between the external and internal interactions. Internal environment consists of patients inner coping skills to adjust to the conditions in the external environment, whereas external environment consists of patients' surroundings such as the nurse (Wisniewski, 2013).

Nursing

Nursing is the final paradigm in relation to the goal attainment theory. It is described as the process of human connections between nurses and patients in which each party views the other

and the circumstance, and through information sharing, they set goals, explore the ways and agree on the ways of attaining set goals (Alligood, 2010). A nurse has his or her major role being the maintenance of patient's health by communication to the patients to enable them set goals and select the methods of goal attainment. The nursing process is made up of five steps which include assessment, implementation, nursing diagnosis, planning and evaluation (Wisniewski, 2013). An assessment begins in the interaction stage of the nurse-client relationship during which a patient should share his self-knowledge, issues, and concerns. Communications skills have to be excellent at the assessment process for the transaction and verification of clients' views to take place. Implementation involves the actual activities undertaken and the succession of transactions in the nursing processes that are utilized to attain the goal. Nursing diagnosis recognizes the disturbances, problems, and concerns using data gathered from the assessment section by mapping out a nursing care plan. The client has to be encouraged to engage in setting goals while making decisions with nurses based on the means agreed upon by the two parties. The final step is where the nurse has to examine whether the goals are fulfilled or not and the efficacy of the patients care (Alligood, 2010).

3.4 Applicability to the Current Study

The study aimed at assessing the health impacts of childhood obesity on students and identifying the roles school nurses should play in those health impacts. The goal attainment theory was appropriate for this topic as it advocates for the establishment of a healthy relationship in which obese children can have their needs taken care of in a respectable manner (Alligood, 2010). Its use was to give a clear sense of the research's approach and guide the researcher throughout the research process. In particular, the goal attainment theory helped organize emerging themes in a manner that would help assist and enhance nursing interventions on the health consequences of childhood obesity.

4. AIMS AND OBJECTIVES

This research project aims to assess how childhood obesity affects student's health and also examine what are some of the nurses' intervention that can be used to prevent these health effects. The researcher utilizes secondary sources of data with the hope of identifying and pinpointing the existing evidence on the health consequences of childhood obesity and the interventions that nurses can take to prevent and treat those consequences.

4.1 Research Objectives

The study mainly aimed at evaluating the health impacts of childhood obesity and the nurses' interventions in relation to those health consequences. In so doing, the researcher had to address three key questions which included:

- 1) What are the health consequences of childhood obesity?
- 2) What is the relationship between childhood obesity and students' health?
- 3) What nursing interventions can be used to prevent childhood obesity?

5. RESEARCH METHODOLOGY

According to (Hsieh & Shannon, 2005) research methodology describes the systematic theoretical analysis of the techniques applicable to a topic of study. It involves the theoretical evaluation of the body of principles and techniques related to a body of knowledge.

Fundamentally, a research methodology describes the manner in which a researcher proposes to undertake his or her research and thus methodology establishes the techniques for use in undertaking a research, the design of the research, target population, sample size and population, and also data collection and analysis techniques. Researchers choose their methodology depending on the nature of the work to be carried out with respect to the research questions. In this research, the researcher undertakes an evaluation of secondary data sources in order to identify the health impacts of childhood obesity on school going children, as well the nursing interventions in such health consequences. As stated by (Webster & Watson, 2002), a successful literature review has to utilize the most relevant secondary data that is available to a researcher. For this study, the author described the overview of studies by other scholars regarding the topic under examination. The inductive content analysis was then utilized in analyzing the most relevant secondary data sources with the objective of quantifying emerging concepts and characteristics.

5.1 Data collection

The researcher sought the approval of the research commissioning department before beginning the data collection process. All relevant paperwork was signed and validated by the relevant people at the university. Secondary data sources were accessed from a number of databases through the Arcada University of Applied Sciences. The identified articles provided the critical background information relating to the research topic and as well helped in responding to the study questions. The search used keywords in gathering publications that contain targeted information in a database. Some of the keywords used in gathering relevant data sourced included words such as "childhood obesity", "health effects of childhood obesity", and "nursing interventions in childhood obesity". Words such as "impacts", "relationship", "effects", and "influence" described the association between childhood obesity and the health effects of obesity

in children. The study focused on assessing the health consequences of childhood obesity among school going children and the nurses' interventions relating to the health consequences of obesity in children, and therefore words such as "nursing interventions in childhood obesity", "nursing practice" and "nurse's responsibility in childhood obesity" were utilized for the literature search. Similar words to the keywords were considered during the literature search to help enhance the quantity of data sources retrievable from the research's key databases: Medline, Science Direct, Google Scholar, EBSCO, and PubMed.

Table 1: Summary of Keyword Search

KEYWORD SEARCH	KEYWORD SEARCH
Childhood Obesity	Students Health
Overweight Children	Students Wellbeing
Nurses Interventions	Obesity in Children
Nursing Care	Nursing Profession

Boolean modifiers were used to help the research get more specific and target search hits. Though each database used Boolean operators differently, the researcher found it necessary to use different Boolean operators as they assisted reduce time and effort by eliminating some of the irrelevant hits that would not be useful in answering the research question (Elo & Kyngas, 2008).

The researcher cross-assessed the scholarly articles to make sure that majority of them answered the research questions on a contact-basis, with only a small number of them based on theories. This was done to ensure that wrong or subjective conclusions were not arrived at since theory based articles only use arguments to arrive at conclusions. Contact-based articles, on the other hand, base their arguments on real-life data gathered by such methods as questionnaires and interviews. The author relied on the contact-based articles to reduce the probability of errors in the research conclusions.

Including and Excluding Criteria

Inclusion and exclusion criteria were first formulated before the start of the research to help ensure that the research questions were more focused and to eliminate bias in article selection. The researcher only considered articles that fully met the pre-established criteria. Below is a summary of the inclusion and exclusion criteria.

Table 2: Summary of Inclusion and Exclusion Criteria

Inclusion Criteria	Exclusion Criteria
Scholarly articles; published between 2005 and 2017	Non-scholarly articles; published before 2005
Articles are relevant and addressed the subject matter under study.	Articles are irrelevant and do not address the subject matter under study
Articles are well-organized with valid, credible and trustful results	Articles are poorly organized and as such their results cannot be trusted or relied upon
Articles can be accessed and retrieved easily at no cost	Articles have to be paid for before access

This including and excusing criteria was used to evaluate all the articles found in the research databases from which data was to be collected. The process through which articles were retrieved is as shown in table 3 below.

Table 3: Article retrieval process

Database used	Date of search	Search result	Duplicates eliminated	Exclusion after reviewing titles and abstracts	After application of Boolean technique	Full-text articles reviewed	Number of articles selected
PUBMED	16/08/17	192	79	53	40	11	2
EBSCO	16/08/17	71	18	19	11	3	2
EMBASE	16/08/17	46	7	0	0	0	0
Science Direct	16/08/17	828	303	123	101	15	4
MEDLINE	16/08/17	17	2	9	2	5	2
Google Scholar	16/08/17	1903	471	574	796	12	0
Total		3057	880	778	950	46	10

The literature searches from the stated databases screened a total of 3,057 articles and titles, from which 880 duplicates were removed. After further assessment of titles and abstracts, another 778 articles were eliminated for they did not satisfy the inclusion criteria. After applying Boolean search, 950 articles were obtained. From these articles, 46 of the most relevant articles were reviewed in full text. Finally, 10 articles that best met the including and excluding criteria and were relevant to the study were identified and chosen for review. The table below summarizes the ten articles that were picked on the basis of inclusion and exclusion criteria for analysis.

Table 4: List of articles used in content analysis

Author	Title	Year	Journal Name
Article 1 C.H. Joan, A.L. Debbie, and Y.S. Sue	Childhood obesity-2010: progress and challenges.	2010	Lancet
Article 2 J.J. Reilly	Descriptive epidemiology and health consequences of childhood obesity.	2005	Best Practice & Research
Article 3 S.R.Daniels	The consequences of childhood overweight and obesity	2006	The future of children
Article 4 M. De Onis, M. Blössner, and E. Borghi	Global prevalence and trends of overweight and obesity among preschool children	2010	The American journal of clinical nutrition
Article 5 N.K. Güngör	Overweight and obesity in children and adolescents	2014	Journal of clinical research in pediatric endocrinology
Article 6 R. Weiss, & S. Caprio	The metabolic consequences of childhood obesity	2005	Best practice & research
Article 7 N.F. Bradford	Overweight and obesity in children and adolescents	2009	Primary Care: Clinics in Office Practice
Article 8 R. M. Puhl, & J.D. Latner,	Stigma, obesity, and the health of the nation's children	2007	Psychological Bulletin
Article 9 M.D. Tsiros, T. Olds, J.D. Buckley, P. Grimshaw, L. Brennan, J. Walkley, A.P. Hills, P.R.C. Howe, and A.M. Coates	Health-related quality of life in obese children and adolescents.	2009	International journal of obesity
Article 10 A.K. Saha, N. Sarkar, and T. Chatterjee	Health consequences of childhood obesity	2011	The Indian Journal of Pediatrics

5.2 Data Analysis

Data analysis describes the process through which raw data is transformed into themes and categories which are meaningful to a reader. The researcher used quantitative content analysis in the analysis of raw data, which according to (Kondracki, Wellman, & Amundson, 2002), is a technique for the explanation of data via systematic categorization procedure of coding and recognizing patterns or themes. This research technique tries to offer knowledge and insights into the phenomenon under study. The researcher was able to utilize content analysis to understand the social realities in a scientific manner through the assessment of contents, recurrent themes, and implication in a specific volume of data (Graneheim & Lundman, 2004). The content analysis method is used when developing themes and in indicating the range of meanings of a phenomenon as opposed to relying on statistical implications of happenings of particular concepts (Elo & Kyngas, 2008).

(Dwivedi & IGI, 2009), notes that content analysis is systematic and objective and thus researchers using this methodology can draw valid and replicable inferences from data with a view to providing a working direction, knowledge, and insights. The researcher found content analysis to be sensitive and flexible with respect to research design. The data analysis technique is however criticized for being simple or difficult depending on the way researchers take it (Elo and Kyngas, 2008). It is also labor intensive and prone to errors especially when intricate and large volumes of data is involved. The author, however, used the method since it is unobstructive and content sensitive. It was also found to be cost-effective and useful in analyzing large volumes of data. Its use can be undertaken for myriad uses and especially in the nursing field. Adequate time had to be assigned to the study and development of categories and themes.

(Elo & Kyngas, 2008) found content analysis effective in evaluating both qualitative and quantitative data, either deductively and inductively. The inductive approach is effective where there exists scarce data on the topic under assessment while the deductive approach is useful where there exists sufficient secondary data. Secondary literature on the health implications of obesity among students was scarce and thus the researcher had to use the inductive approach in which concepts were derived from data. Through the inductive approach, specific cases had to be considered and later unified to form a larger whole. The importance of content assessment lied in

its capability to evaluate questions that may not be answered through quantitative methods (Kohlbacher, 2006).

5.2.1 Inductive and Deductive Approaches

There are three critical approaches to qualitative content analysis (Hsieh & Shannon, 2005).

First, there is the summative content analysis in which a researcher starts by counting words and later extending the assessment to account for latent themes and meanings. The technique seems quantitative in the initial phases but aims at exploring the use of words in an inductive manner. Second, is the direct content analysis whereby a researcher starts by developing a theory and making allowances for themes to emerge as the data analysis process proceeds (Graneheim & Lundman, 2004). The approach is useful in validating and extending conceptual frameworks. Finally, is the conventional content analysis whereby coding of categories is derived indirectly and directly from raw facts and figures. This approach is useful when developing the grounded theory. However, it enables researchers to assign units of texts to more than one theme simultaneously, which is not the possible with quantitative content analysis, categories and subcategories are mutually exclusive meaning that sentences or words must always be found in one category or subcategory (Graneheim & Lundman, 2004).

Throughout the content analysis process, the author had to pay great attention to the research questions. There was the need to thoroughly understand the data in its entirety in order for the researcher to easily concentrate on most relevant and specific aspects of the content. The open coding process was utilized in organizing relevant articles whereby numbers from one to ten represented the reviewed articles. The researcher had to repeatedly read the articles while taking notes from the ten articles. Important information was thereafter listed and reexamined with each item being classified in a manner that provided a proper explanation of what the category was all about (Graneheim & Lundman, 2004). Any relationships between categories were later listed as being either major or minor theme. These themes were to be later assessed in detail to establish their fit, usefulness and whether their information was adequate. An evaluation was also undertaken to establish whether to subdivide the themes into categories or not. Finally, the researcher reviewed the original articles with a view to ensuring that all the useful information had been incorporated into the development of themes. The researcher had to develop categories that would help in the provision of adequate responses to the research questions. These

categories were based on the themes developed using the inductive content analysis approach. Sub categories were established where there was a need.

The relationship between childhood obesity and students health was found to be the main theme across all the ten articles reviewed. All other sub-themes and categories depended on the main theme. There were two sub-themes to this main theme i.e. the relationship between being overweight and the health of school going children, and enhancing students' health in school. Major and minor categories included the impacts of childhood obesity on students' health and the nature of the relationship respectively. Each and every article had extensive information on the main theme but some lacked information on some major and minor categories.

5.3 Ethical aspects of the research study

In any work of research, many issues need to be taken care of before the commencement of the study. According to (Boutin-Foster et al., 2013), researchers must take into account the intrapersonal aspects, the interpersonal factors, community-based factors, policy factors and organizational factors before the research. In order to maintain ethical standards, the researcher had to maintain the instructions and standards of scientific research by the Arcada University of applied sciences. The research topic had to be first identified and discussed with the supervisors for approval and guidance. Being a member of the university, the researcher had to the rights and freedom granted by the institution to access the databases containing the scholarly articles.

With regard to plagiarism, the author had to avoid quoting other researchers work directly without referencing them correctly and honestly. Quotations had to be paraphrased and cited properly to avoid any sort of plagiarism within the research study. Other researchers' rights in regard to dates of birth, addresses, and names were respected and kept confidential throughout the research process.

Themes, ideas, and concepts in all ten articles were not falsified in any way as the researcher had to represent them in an honest way. Ideas and concepts based on evidence were not influenced by the author's emotions and opinions. The author has to take into consideration the sustainable approaches to gathering and analyzing research data. Objectivity in collecting, analyzing and interpreting data was maintained so as to avoid any form of biases. Each and every article was

analyzed independently to ensure that other articles were not influenced by their interpretation (Elo & Kyngas, 2008).

6. RESULTS

The analysis and summary of the research results are found in this part. The results in this chapter are based on the evaluation of the ten scholarly articles. The main focus for the researcher was to evaluate the health consequences of childhood obesity among school going children. An analysis was done using the qualitative content analysis as indicated in the methodology chapter.

6.1 Health Consequences of Childhood Obesity

Many of the articles reviewed documented the health consequences of childhood obesity among school going children [1, 2, 3, 4, 5, 6, 7, 8, 9, and 10]. These health problems were divided into two and are presented as under:

6.1.1 Physical consequences of childhood obesity

Childhood obesity is found to negatively influence entirely every organ of children's body and has serious health implications [1, 2, 3, 4, 5, 6, 7, 8, 9, and 10]. It is found to be linked with co-morbidities and chronic health illnesses which can result in early morbidity in students, including early cardiovascular diseases, impaired insulin sensitivity, high blood pressure, and certain types of cancer (esophageal, colorectal and kidney cancers) [1, 2, 3, 4, 5, 6, 7, 8, 9, and 10]. In addition, childhood obesity increases the risk of breathing difficulties and in worst conditions death (WHO, 2016). However, most of these physical health conditions can be prevented when a child is helped to reach a healthy body mass [1, 3, 5, 6, 9, and 10].

Type two diabetics

Some articles linked childhood obesity to type two diabetic which is a chronic condition affecting the way students body processes glucose [1, 2, 5, 8 and 10]. Overweight children are two times riskier than those who have normal weights [1, 9, and 10]. The prevalence of the disease is noted to be on the increase since the turn of the 21st century due to lack of proper diets and sedentary living. The condition is found to occur in children who are excessively overweight and who are mostly inactive in physical activities [2, 4, 5, 6, and 7].

Cardiovascular diseases

Students who are overweight were found to have increased chances of having cardiovascular risk factors leading to cardiac structural and hemodynamic alterations comprising hypertension, increased ventricular mass endothelial dysfunction, atherosclerosis, carotid artery intimal thickening as well as early coronary and aortic streaks and fibrous plaque [1, 2, 3, 4, 5, 6, 7, 8, 9, and 10]. Higher BMIs were found to be correlated to increased chances of coronary heart disease in middle age. More articles proved that obesity produces varieties of cardiac structural alterations and hemodynamic changes and increased adipose accumulation which induces high blood volume and cardiac output [1, 2, 8, 9, and 10]. These abnormalities were found to result in cardiomyopathy, in morbid obesity [1, 8, 9, and 10].

Dyslipidemia

Dyslipidemia describes the availability of abnormal quantities of lipids in children's blood. Such lipids as triglyceride and cholesterol in blood were seen to be widely risk factors for cardiovascular conditions [1, and 2]. Overweight children were found to have a threshold effect on dyslipidemia whereby increased adiposity lead to abnormal lipid levels [1]. The seriousness of the disease was however found to be determined by other factors but was found to be a predictor for dyslipidemia in middle age [1].

Hypertension

Primary high blood condition was previously unheard of but studies have established that obese and overweight children are at a higher risk of becoming hypertensive [1, 2, 3, 4, 5, 6, 7, 8, 9, and 10]. Those who are too obese had their risk levels were three times higher than those who had "normal" weights. The condition was seen to be as a result of sodium retention, increased angiotensin system action and increased sympathetic tone [4, 6, 7, 9, and 10]. Wait circumference that had increased weight was independently found to be associated with hypertension [7].

Non-alcoholic fatty liver disease (NAFLD)

NAFLD was found to be strongly connected with insulin resistance and visceral adiposity and was seen to be the most common liver disease worldwide [8, 9, and 10]. This disease was noted

to be a health consequence of childhood obesity. When a student becomes overweight too much cholesterol is stored up in the liver and that can lead to the nonalcoholic fatty liver disease [9 and 10]. The spectrum of the disease was seen to range from simple steatosis to more severe state hepatitis characterized by fibrosis, hepatocellular injury and hepatic inflammation. Spleen enlargement was seen to be less common but liver enlargement was noted in many of the articles [10].

6.1.2 Psychological Health Consequences

Overweight students were found to have adverse psychological experiences compared to the normal weight counterparts [1, 2, 3, 4, 5, 6, 7, 8, 9, and 10]. Stigmatization, teasing and bullying in school was seen as the major reasons for the psychological issues in overweight students [1, 2, 3, 4, 5, and 10]. These issues were established to have significant effects on obese children who were seen to have a small circle of friends owing to their weight issue [1, 7, 8, 9, and 10]. Some of these pupils turn to eating too much food in order to cope with the associated negative emotions such as anxiety and stress [1, 2, 3, 4, 5, 6, 7, 8, 9, and 10]. As the childhood period is a demanding one, those who are overweight shy away from their normal weight peers owing to their low self-esteem and poor body image [1, 2, 3, 4, 5, 6, 7, 8, 9, and 10].

Depression and anxiety

Obese pupils were found to be more prone to depression and anxiety [1, 2, 3, 4, 5, 6, 7, 8, 9, and 10]. This was due to the teasing and stigmatization from their peers at school who bully them for their weight issue. This teasing and stigmatization results into them eating too much which further exacerbate the weight issue [1 and 2]. Studies also noted that overweight children were at a higher risk of psychological stress which is significantly associated with depression [1, 5, 7, and 10].

Lower academic performance

Almost all the articles underscored the link between obesity and school performance [1, 2, 3, 4, 5, 6, 7, 8, and 10]. Those who had above normal weights were found to perform poorly when compared to normal weight children [1, 2, 3, 4, 5, 6, 7, 8, and 10]. These overweight students were also more likely to miss classes specifically due to having to deal with the chronic health issues such as asthma and diabetes [1, 4, 5, 6, 7, 8, and 10]. Those who had insulin resistance and

hypertension issues scored lower marks than those with no issues to deal with. Teasing and bullying also affected the performance of these innocent children [2, 3, and 10].

6.2 The Association Between Students' Health and Childhood Obesity

All of the articles analyzed showed that childhood obesity is significantly related to students' well-being [1, 2, 3, 4, 5, 6, 7, 8, 9, and 10]. The relationship is however negative as most of the consequences of childhood obesity adversely affect students' lives [1, 2, 3, 4, 5, 6, 7, 8, 9, and 10]. All of the articles showed that obese kids had a high risk of acquiring both physical and psychological health conditions such as hypertension, depression, anxiety, Dyslipidemia, type 2 diabetes and cardiovascular diseases [1, 2, 3, 4, 5, 6, 7, 8, 9, and 10]. The study also showed that those who were obese performed badly when compared to their peers, as they had to deal with their issues most out of classes [2, 3, and 10]. For example, these obese children had to be attended to on a regular basis by a professional and that required them to miss classes at times which was not the case with normal weight peers. These physical and psychological issues were found to negatively affect the quality of life for these young people [1, 2, 3, 4, 5, 6, 7, 8, 9, and 10]. They are forced to live non-normal lives of constant care and stress. However, the study recognized that childhood obesity can be prevented or cured and as such, there is hope for those dealing with the negative consequences of obesity [7].

6.3 Nurses' Interventions with Regard to Childhood Obesity

Healthcare professionals such as school nurses were found to play an essential role in the health consequences of childhood obesity among school going children. They should first understand the genetic makeup of students that can result in obesity and screening approaches available for childhood obesity prevention [1, 2, 7, and 9]. Obesity's predispositions can be either cultural, socio-economic or genetic. A child's culture influences the type of food they take and the type of activities they engage in. socioeconomic factors also play a role as most of the balanced foods are a bit expensive for the common populace. Genetic makeup also plays the major role in a child's metabolism and hormone development determines their risk levels. Understanding of these three predispositions is critical for nurses to be able to better recommend what is best for an obese child [7 and 9].

One of the interventions that nurses can have childhood obesity prevention discussions with children, their parents and teachers on the need for a healthy living plan [1, 2,7, and 9]. Under this strategy, the nurses have to avail information on how the students can eat healthy foods and engage in physical activities that help burn excess calories in their bodies [2 and 7]. Parents have to be encouraged to motivate their children to stop eating junk foods and in place eat more of vegetables and fruits. The nurse should educate and motivate teachers to alter the calorie content of school meals and increase physical activity for the children. They should recommend the implementation of policies that ensure increased physical activities at school and eating more fruits and vegetables [1, 2, 7, and 9].

Another intervention for nurses is to have a secondary prevention of childhood obesity. They should screen children for obesity and overweight risk factors during their regular visits to their stations [1, 2, 7, and 9]. In this regard, they have to make sure that their measurements are precise for weight and height when computing children's BMI [2, 7, and 9]. They should also recommend the proper diets and activities for those intending to lose weight or are overweight. Other interventions involve surgical treatments of obesity in children by the use of bariatric surgery in severe cases [1, 2, 7, and 9]. This intervention is however restricted because the surgical procedure involves serious complications including wound dehiscence, bowel obstruction and perioperative mortality [1, 2, 7, and 9].

7. DISCUSSION

In this research, the author attempted to examine the health consequences of childhood obesity among school going children. The study also undertook to assess some of the nurses' interventions that can help prevent and treat some of these health consequences. The study established that childhood obesity negatively affects children's well-being as it is related to chronic health issues that can result in early morbidity (Daniels, 2006). Issues such as impaired insulin sensitivity, cardiovascular diseases, kidney, colorectal, and esophageal cancer as well as hypertension do increase the likelihood of early morbidity and mortality later in children's life. Additionally, the study found that there are some cases of type two diabetes in school going children which can have long-term consequences when left untreated. Those who are obese were found to be more likely to have cardiovascular risk factors leading to hemodynamic and cardiac structural alterations including high blood pressure.

Psychologically, childhood obesity was found to be associated with psychological issues such as bullying in school, poor academic performance, depression, and low self-image (Gungor, 2014). Obesity and overweight, together with their associated health conditions are preventable and treatable. This means that good interventions can be put in place to prevent and check on these two weight issues in children. Some of the noted interventions that were advocated for include increased physical exercise and enhanced nutrition: limiting the television and screen time; consumption of fruits and vegetables; consumption of low sugar-sweetened beverages; eating breakfast daily, and eating family meals together (Joan, Debbie, & Sue, 2010). These measures along with regular screening can help check on the negative consequences of obesity in children. Those who are already obese can have a weight-loss program recommended on them based on good screen and review of their genetical, cultural and socioeconomic factors. Lifestyle modifications are essential in preventing childhood and adolescent obesity. These exercise and dietary modifications are seen to work in cutting weight and controlling the health consequences of childhood obesity. Treatment is also available for those with severe health cases. Treatment includes a surgical operation for children by the use of bariatric surgery in severe cases. Another treatment method is the Pharmacologic treatment in which anti-obesity drugs are administered to the obese children by qualified and experienced clinicians. These two treatment interventions are however restricted because they involve serious complications including wound dehiscence,

bowel obstruction, and perioperative mortality. They are only recommended when the situation is worse and where an experienced nurse or clinician is involved.

7.1 Implying nurse's interventions through theoretical framework

The study reviewed ten articles with a view to assessing the interventions available for controlling childhood obesity together with its health associated consequences. Out of these ten articles, only four of them included a direct link on nurses' interventions on the effects of childhood obesity. The six other articles had an only general suggestion on the significance of interventions to alter the negative consequences of obesity in school going children.

King's goal attainment theory was the base theory for this research as indicated in the theoretical framework section. The model suggests a client-centered approach in which nurses and their patients understand each other and their environment clearly before they engage in any goal setting process (Alligood, 2010). Nurses are supposed to establish human connections between themselves and these obese children, and through information sharing, they set weight management goals, explore the ways and agree on the ways of attaining set goals. A nurse has his or her major role being the maintenance of obese student's health by communication to them to enable them to set weight management goals and select the methods of goal attainment such as eating healthy and engaging in vigorous physical activities (King, 1992). The nursing professionals should assess, implement, diagnose, plan and evaluate these obese children with a view to recommending the best weight management strategies guided by their genetic, cultural and socioeconomic backgrounds (Alligood, 2010).

As per King's Goal attainment theory, a healthy relationship between the nurses and the obese children is essential as well as their commitment to the relationship, in the attainment of set goals (George, 2011). Nurses should commit to understanding their patients' genetic makeup, socioeconomic status, and their cultural backgrounds in order to better understand them and recommend best strategies for preventing the health consequences of obesity. The nurses should help the obese children by motivating and supporting them in engaging in vigorous physical activities and eating healthy foods that help manage their weight and prevent the physical and psychological health conditions (George, 2011). The nurses should work closely with the children's parents, guardians and teachers to help attain the set goals.

The obese and overweight children should show commitment which involves cooperating with the nurses in establishing the goals such as managing their weights, engaging in vigorous physical activities and eat balanced foods, cooperation by being truthful in responding to the nurses' queries and in assessing their situation (Alligood, 2010). The children's parents and teachers should play a critical role in encouraging the children to keep them motivated towards sticking to the attainment of the established goals. The parents should establish the right environment to encourage, care and help the obese children attain their goals.

8. CONCLUSION AND RECOMMENDATIONS

This section of the research summarizes the findings of the research and recommends what scholars should do for an informed decision regarding the prevention, management, and treatment of the health consequences of childhood obesity.

8.1 Conclusions

The study concludes that childhood obesity is an intricate disorder that results in various types of health issues. It has critical influences on the psychological and physical health status of school going children. Physical issues such as impaired insulin sensitivity, cardiovascular diseases, kidney, colorectal, and esophageal cancer as well as hypertension can increase the likelihood of early morbidity and mortality later in children's life. Additionally, the study concludes that there are some cases of type two diabetes in school going children which can have long-term consequences when left untreated. Those who are overweight and obese are more likely to have cardiovascular risk factors leading to hemodynamic and cardiac structural alterations including high blood pressure. Psychological issues including bullying in school, poor academic performance, depression, and low self-image were also seen to affect obese and overweight children. The study, however, noted that childhood obesity and overweight, together with their associated health conditions are preventable and treatable.

The study concludes that good interventions should put in place to prevent and check on weight issues in children. Some of the noted interventions that are advocated for include increased physical exercise and enhanced nutrition: limiting the television and screen time; consumption of fruits and vegetables; consumption of low sugar-sweetened beverages; eating breakfast daily and eating family meals together. These measures along with regular screening can help check on the negative consequences of obesity in children. Those who are already obese can have a weight-loss program recommended on them based on good screen and review of their genetical, cultural and socioeconomic factors. Lifestyle modifications are essential in preventing childhood and adolescent obesity. These exercise and dietary modifications have been seen to work in cutting weight and controlling the health consequences of childhood obesity. Nurses should also play their role in treating severe health cases. Treatment should include performing a surgical operation by the use of bariatric surgery and pharmacologic treatment methods in severe cases.

These two treatment interventions are however restricted because they involve serious complications including wound dehiscence, bowel obstruction, and perioperative mortality.

8.2 Critical Analysis

The research discovered that childhood obesity has been negatively affecting school going children. However, these health consequences may be not adequately discovered especially when a researcher collects data from unwilling respondents who may be not free to share on what they go through due to their being overweight or obese. This may lead to misleading results which may not be reliable for any guidance. In view of the foregoing, the research used only evidence-based scientific literature to respond to the formulated research questions. The health consequences of childhood obesity were many and therefore could not be found in a single article. This meant that the author evaluates several articles before arriving at the relevant list of ten articles for the study.

The research subject was found to be wide, involving a background evaluation of what health consequences of obesity are and what aspects of children needed to be taken care of. Most of the articles address obesity in general covering obesity in both children and adults and in that respect the researcher had to combine the relevant information and come up with a unified set that addressed the topic under research. The study was however limited to peer-reviewed articles published between 2005 and 2017 as the researcher could not find recent articles that corresponded to the health consequences of obesity in school going children. Most recent articles from 2013 and present did not have all the required information needed to undertake the research and therefore the researcher had to extend the search to the year 2005.

The study had to give equal attention to all evolving themes and subthemes in order to eliminate research bias and achieve objectivity in the results. Research reliability and validity aspects were considered throughout the study. The researcher selected the most relevant articles in order to ensure credibility in the study outcome. The researcher depended on scholarly articles that had the most relevant information and disregarded those that were either irrelevant or scholarly. Dependability for the study was attained through the utilization of data from different time periods. The researcher also clearly described the selection of units, data gathering and the analysis process to ensure transferability of the research outcome. The author is thus confident

that the use scientific, relevant and peer-reviewed articles assisted attain validity, credibility, and reliability of the research outcome.

8.3 Suggestions for Further Research

Owing to the negative health consequences of childhood obesity, the study recommends that nurses, parents, and teachers play their role in helping children prevent the physical and psychological conditions. They should encourage these obese children to actively participate in vigorous physical activities, eat well and dissuade other students from bullying or teasing obese peers.

The researcher further recommends that future research to be conducted to establish the non-health consequences of childhood obesity. Such kind of research would help healthcare professionals in making more informed decision regarding school going children. Besides, further research should be conducted to establish the extent to which childhood obesity and overweight impacts on the young populace.

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