**Literature Review**

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| **Reference­­:** X. Pang, C. B. Forrest, F. Lê-Scherban and A. J. Masino, "Understanding Early Childhood Obesity via Interpretation of Machine Learning Model Predictions," 2019 18th IEEE International Conference On Machine Learning And Applications (ICMLA), Boca Raton, FL, USA, 2019, pp. 1438-1443. |
| **Summary:** X. Pang and team (2019) develops a machine learning model named XGBoost to understand the patterns in Obesity among Childrens. In this research, authors considered most common factors that contribute to childhood obesity such as weight, height, race, and ethnicity. Through the developed machine learning model, they accurately predicted possible obesity among the children of age between 24-36 months with accuracy of 81%. This research is restricted to understand the obesity in Childrens and does not consider the extra factors that could led to obesity in people with age. The interesting assumption in this research is that authors also included factors such as body temperature and respiratory rate which practically could be the best predictors for obesity even in people of any age. |
| **How this source will help my research topic:** X. Pang team’s research is proven to analyze the obesity patterns in children with age between 24-36 months by developing the machine learning model with accuracy of 81%. This is achieved by considering factors such as weight, height, race, ethnicity along with uncommon but important factors such as body temperature and respiratory rate. But this research is limited to predicting the obesity possibilities and understanding patterns in children and does not consider the factors that could add-on with age contributing to obesity such as lifestyle, diet, and living environment. The research highlights this issue but did not consider which is included in our research to even understand some new factors that lead to obesity with age. Our research along with understanding the underlying factors for obesity, also filters the necessary suggestions to people, policy makers and drug developers after analyzing the patterns to eradicate obesity. |

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| **Reference:** H. A. Obaid, S. Sheel, N. Ali Hussien, S. Rahim Alatba, M. Saleem and H. Warush, "Analyzing the physical activity and exercise management for obesity and weight loss based on fuzzy logic," 2023 International Conference on Emerging Research in Computational Science (ICERCS), Coimbatore, India, 2023, pp. 1-6. |
| **Summary:** In 2023, H. A. Obaid and their team worked on developing a framework that dynamically suggests personalized exercise training and improvements in physical activity for individuals suffering from obesity and aiming for weight loss. This framework considers various factors including age, BMI, and others. The research underscores the significance of monitoring caloric consumption, weight tracking, and engaging in physical activity, identifying different thresholds where obesity can adversely affect health. The developed framework has been shown to be 93% efficient in achieving its defined objectives. However, the research did not delve into analyzing the crucial underlying factors contributing to obesity or weight loss. Nonetheless, it incorporates fuzzy logic to provide dynamic suggestions to individuals based on their current condition, offering tailored exercise training and strategies for enhancing physical activity. |
| **How this source will help my research topic:** H. A. Obaid's team developed a framework, based on fuzzy logic, that provides suggestions for individuals with obesity based on their current conditions, offering suitable exercise training along with physical activity, achieving a proven efficiency of 93% with its objectives. However, this research is limited to suggestions through its fuzzy logic framework and does not give importance to understanding the underlying factors that lead people to this problem. Understanding these factors and providing suggestions based on them might increase the accuracy of the model even further, leading to more efficient suggestions for consumers. This issue is primary in the research we proposed, initially analyzing the underlying factors that lead to obesity across different age groups and providing dynamic suggestions to individuals, policymakers, and, most importantly, drug developers to achieve positive results with clinical trials aimed at eradicating obesity from its roots. |

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| **Reference:** K. Alam, D. Chowdhury and P. Haque, "An Intelligent System for Obesity Detection through Human Activity Recognition and BMI Prediction," 2023 26th International Conference on Computer and Information Technology (ICCIT), Cox's Bazar, Bangladesh, 2023, pp. 1-6. |
| **Summary:** K. Alam and their team (2023) developed an android application aimed at guiding people to track their calorie consumption and physical activity, thus promoting a healthy lifestyle, and preventing obesity. The research addresses the general problem of obesity, often resulting from an imbalance between calorie intake and physical activity. The team integrated a deep learning model to analyze food consumption and physical activity tracked by built-in mobile sensors, providing necessary steps to prevent obesity. An interesting finding is that the application achieves a 99% accuracy rate in fulfilling its objectives through the implication of the deep learning model. However, the developed model focuses solely on providing appropriate suggestions to individuals and healthcare professionals. It falls short in addressing the eradication of the problem by suggesting policies to policymakers. Such policies have the potential to eliminate this issue, which differs from the focus of our research. |
| **How this source will help my research topic:** The research highlights that obesity is mainly caused by an imbalance between food consumption and physical activity. However, this assumption is just one aspect considered in our research. In addition to this assumption, we broaden our analysis to explore other factors contributing to obesity. While the application developed by this team offers appropriate suggestions to individuals and healthcare professionals, like our research, we extend our recommendations to policymakers to address the problem at its core and to drug developers to create more efficient drugs. In summary, while this research acknowledges the imbalance between dietary habits and physical activity as a significant factor in obesity, our research primarily focuses on identifying patterns of various factors contributing to obesity. We provide filtered suggestions to individuals with obesity, healthcare professionals, drug developers, and policymakers, aiming to address the issue comprehensively. |

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| **Reference:⁠** ⁠Bray, G. A. (2004). Medical consequences of obesity. The Journal of clinical endocrinology & metabolism, 89(6), 2583-2589. |
| **Summary:** George has put together a detailed study on how obesity can be a root cause of many life-threatening diseases and the categories by which these obesities are caused. He also stresses the various secretions in different parts of the human body caused by these types of fat accumulation. These secretions at different tissues are leading to various health diseases, both directly and indirectly. The main factor for this categorization is BMI and each value categorizes the risk and their health conditions. The overall focus of this research is on how all these together are reducing the life span of people and in some cases causing sudden deaths in humans recently. It also speaks about the benefits of weight loss from the medical aspects of how each step towards the reduction of weight helps improve their health. They talk based on previous proven evidence and what percentage of it was a success or failure. |
| **How this source will help my research topic:** This research will help us understand the different categories obesity is caused and give a better explanation of underlying factors that lead to obesity in people. This will be the primary step of our research to identify the different patterns that are causing obesity in different age groups of people. Through this research, the author tries to focus his study mostly on medical terms and how each enzyme shows changes based on the activities and drugs, but we will use this evidence of success to provide suggestions and assurance to people to motivate them to focus on the health aspects and that it over the years can be dangerous. This will also add up to the suggestions we can provide to policy makers and drug developers for the demand for more specific obesity drugs based on different categories. |

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| **Reference:** N. A. Wahab, N. N. Norhisham, A. H. Mohammed, A. Osman, N. Ibrahim and S. S. M. Ilyas, "HealthyMe: A Persuasive Obesity Care Management Application," 2022 2nd International Conference on Electronic and Electrical Engineering and Intelligent System (ICE3IS), Yogyakarta, Indonesia, 2022, pp. 213-218. |
| **Summary:** N. A. Wahab and their team (2022) developed a web-based application named HealthyMe, which provides recommendations to obese patients regarding their food selection, exercise, and overall lifestyle. The authors' approach to providing appropriate suggestions is based on three principles: the principle of cause and effect, attractiveness, and tailoring. Through this method, the authors observed that consumers were attracted to the services, which helped them reduce their weight and adopt a healthier lifestyle. However, this application's services were limited to obese patients and did not filter suggestions that could be useful for policy makers or drug developers. Nonetheless, the interesting factor lies in the approach used to provide suggestions only after understanding the individual's food selection and lifestyle, making the service more efficient. |
| **How this source will help my research topic:** Through this research, the authors developed a web-based application that provides appropriate suggestions to obese patients based on their food consumption, exercise, and overall lifestyle. While current lifestyle is often the primary factor influencing an individual's health, there may be hidden factors such as genetics that contribute to obesity, warranting investigation and filtering suggestions accordingly. This is where our research initially identifies the factors responsible for obesity. The HealthyMe application is limited to providing result-oriented suggestions to obesity patients based on their food consumption and lifestyle. However, our research, after analyzing these factors, offers necessary suggestions to various segments of the population, including patients, drug developers, healthcare professionals, and policy makers. |