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UNDERSTANDING SIMAN MUFRIT (OBESITY) THROUGH THE LENS OF UNANIMEDICINE: A HOLISTIC PERSPECTIVE OF ITS MAHIYAT (PATHOPHYSIOLOGY)

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ABSTRACT: Obesity is a prevalent nutritional disorder and an important global health issue, defined as over-accumulation of fat in the body leading to metabolic and cardiovascular diseases. In the field of Unani medicine, it is called *Siman Mufrit* and is recognized as a manifestation of deranged *Khilṭ-i-Balgham* (phlegmatic *humour*) related to the digestive system and metabolic processes. There is an increasing prevalence of obesity; estimates suggest that by 2035 more than four billion people will be overweight or obese. Obesity has many causes including genetics, diet, exercise, and mental health. BMI (body mass index), skin fold thickness measurement, and waist-to-hip ratio assessments are well-established diagnostic methods. Knowledge of Unani insight on *Mahiyat* (pathophysiology), *Asbāb-e-Mukhatira* (Risk factors), and *Awarizat* (Complications) of *Siman Mufrit* (obesity) is a key component for designing prevention and intervention strategies that can be implemented in daily practice with better holistic management by adopting dietary modifications, physical activity and herbal treatments to restore humoral swayed.

INTRODUCTION: Obesity is the most widespread nutritional disorder globally [1]. The term "obesity" is derived from the Latin word 'obedere,' meaning "to devour," and "very fat" in English; it refers to excessive fat accumulation [2]. Obesity may be defined as an abnormal growth of the adipose tissue due to an enlargement of fat cell size (hypertrophic obesity) or an increase in fat cell number (hyperplastic obesity) or a combination of both [3]. In the Unani system of medicine, obesity is classified under the term *Siman Mufrit*, which is derived from two words: *Siman* means fat, and *Mufrit* means excessive.

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Additionally, the Persian term *Farbahi* is synonymous with obesity *(Motāpā)* [4]. According to Unani physicians, obesity comes under the heading of *Amrāḍ Balghamiyya*. Overweight and obesity rank as the fifth biggest cause of death worldwide.

Obesity increases the chance of developing hypertension, diabetes, gallbladder disease, coronary heart disease, some types of cancer including endocrine-related and large bowel malignancies, and infertility. It reduces men's and women's life expectancy by 7.1 and 5.8 years, respectively [5].

Obesity is a major public health concern in high-income countries and is increasingly becoming a significant health challenge in low-income nations, such as India. The rising prevalence of obesity necessitates urgent public health interventions to mitigate its impact on global health [3].

Global and National Prevalence of Obesity: The World Obesity Atlas 2023 projects that by the year 2035, more than 4 billion individuals could be affected by overweight and obesity, a significant rise from the 2.6 billion cases recorded in 2020. This shift indicates an increase in global prevalence from 38% of the population in 2020 to over 50% by 2035, excluding children under the age of five.

In India, the World Obesity Atlas 2023 estimates that adult obesity will rise at an annual rate of 5.2% between 2020 and 2035, whereas childhood obesity is expected to increase at a higher annual rate of 9.1% during this time, emphasizing the need for targeted public health interventions [6].

MATERIAL METHODS: Classical and important text is taken from Unani literature as well as contemporary medicine, which served as the foundation for the *Siman Mufrit*. These books provide the data and assertions used in the articles. Scientific research articles are also used for the source of information published in journals that are available *via* resources such as Google Scholar, Scopus, PubMed, and Science Direct, which were used to collect more data.

Diagnostic Tools for Assessing Obesity: Obesity is characterized by an increase in body fat mass at the expense of other body components. However, the body's water content remains unchanged. While obesity can often be visually identified, precise assessment requires standardized measurements and reference criteria.

For adults, several indicators are used to assess obesity, including:

Body Mass Index (BMI) (Quetelet's Index): The concept and formula for BMI were first introduced in the early 19th century by renowned mathematician Lambert Adolphe Jacques Quetelet [7].

In practical applications, BMI is the most widely utilized indicator. It is calculated using the formula.

$$BMI = \text{Height (m)}^2 / \text{(Weight (kg)}$$

A normal BMI falls within the range of 18.5 to 25 kg/m². Individuals with a BMI above 30 kg/m² are classified as obese, while those with a BMI between 25 and 30 kg/m² are considered overweight [8].

TABLE 1:

Classification	BMI	Risk of comorbidity
Underweight	<18.50	Low (but risk of other clinical problems increased
Normal weight	18.50 - 24.99	Average
Overweight	≥25	
Pre - obese	25-29.99	Increased
Obese class 1	30-34.99	Moderate
Obese class 2	35-39.99	Severe
Obese class 3	≥40	More severe

Widely used for obesity assessment.

Limitations: Does not differentiate between fat and muscle mass.

The Body Mass Index (BMI) is among the most commonly used measures for assessing obesity [3].

Skin Fold Thickness Measurement: Skin fold thickness measurement is a quick, non-invasive method for assessing body fat, primarily subcutaneous fat. It utilizes calipers like the Harpenden skin fold calipers, with measurements taken at the mid-triceps, biceps, subscapular, and suprailiac regions. The sum of all measurements should not exceed 40 mm in males and 50 mm in females. However, standardized reference values are lacking, and accuracy is reduced in extreme obesity. A key limitation of this method is its low repeatability [3].

Waist Circumference and Waist: HIP Ratio (WHR): Waist circumference, measured at the midpoint between the lower border of the rib cage and the iliac crest is a widely utilized anthropometric parameter for assessing adiposity. This measurement is independent of height and exhibits a strong correlation with body mass index (BMI) and waist-to-hip ratio (WHR) and is an approximate indicator of intra-abdominal fat mass and total body fat. The high waist-to-hip ratio reflects risks for cardiovascular disease and other forms of chronic diseases. There is an increased risk of metabolic complications for men with a waist circumference of ~102 cm and women with a waist circumference of ~88 cm. It has become accepted that a high WHR (> 1.0 in men and > 0.85 in women) indicates abdominal fat accumulation [3].

Perspectives of Obesity According to Unani Physicians:

***Hippocrates (Buqrat, 460–370 BC)*:** Introduced the concept of *Siman Mufrit* (obesity) in his seminal work *Fusūl-e-Buqrātia*. He provided a comprehensive discourse on obesity, detailing its pathophysiology, associated complications, preventive measures, and management strategies. His insights laid the foundation for the understanding of obesity as a medical condition requiring systematic assessment and intervention [4].

Rofus (98–171 AD) in his treatise *Tahzīl Sameen*, postulated that individuals with excess adiposity are more susceptible to various ailments. He attributed this vulnerability to a deficiency of *KhoonSāleh* (good-quality blood) and an excess of *Khilṭ-i-Balgham* (phlegmatic humour), disrupt physiological balance and predisposes individuals to disease [4].

Rofus also stated that obesity in women adversely affects pregnancy outcomes. He stated that excessive adiposity increases the likelihood of spontaneous abortion during the gestational period and predisposes individuals to multiple complications during childbirth [9].

Jālinoos (Galen, 129–210 AD) observed that obesity is associated with increased mortality compared to leanness. He hypothesized that excessive adiposity reduces vascular diameter, leading to *Imtilā'* (congestion) and impairing *Tarwīḥ* (adequate perfusion). This disruption in circulation according to Galen results in tissue hypoxia and an elevated risk of sudden death [10].

Ibn Sīnā (Avicenna, 980–1037 AD), a distinguished physician and philosopher elaborated the concept of end-organ damage in obesity. He postulated that obese individuals are more susceptible to disease arises from the weakening of *HarāratGharīzia* (innate heat) due to *Sū'-i-MizājBārid* (morbid cold temperament) and vascular constriction. This constriction impairs the passage of *Rūḥ* (pneuma) to vital organs, ultimately leading to organ dysfunction and failure [11].

Ibn Nafīs (1207–1288 AD), in his treatise *Mūjaz Al-Qānūn*, explored the association between morbid obesity and various systemic diseases. He highlighted the increased risk of cardiovascular, cerebrovascular, and pulmonary disorders, along with the prevalence of palpitations in obese individuals. His observations contributed to the early understanding of obesity-related pathophysiological complications [12].

Azam Khan (1813–1902 AD), in his medical compendium *Rumūz-i-A'ẓam* outlined comprehensive treatment guidelines for *Siman Mufrit* (obesity). His work provided therapeutic strategies aimed at regulating body weight, addressing underlying imbalances, and mitigating obesity-related complications [13].

Classification of *Siman Mufrit:* According to *Abu Bakr Bin Zakariya Razi*, *Siman Mufrit* (obesity) is classified into two categories.

Local *(Maqāmī)* or Organ-Specific Obesity: This refers to the accumulation of *Shahm* (fat) in a specific organ (*A'ḍā'*) leading to localized adiposity.

Generalized *(Umūmī)* Obesity: This denotes an excessive and widespread deposition of *Shahm* (fat) throughout the body, resulting in systemic obesity [14].

Unani Mahiyat* (Pathophysiology) of *Siman Mufrit: *Siman Mufriṭ* is a condition caused by an imbalance in the temperament of phlegm *(Sū'-i-MizājBalghamī).* According to Unani scholars, all white and colorless bodily fluids fall under the category of *Khilṭ-i-Balghamī*. When the quality and quantity of this humor become abnormal, it leads to phlegmatic disorders *(AmrāḍBalghamiyya)*, which triggers pathological changes in the body [15]. Since phlegmatic humor (*Khilṭ-iBalghamī)* is predominant in obese individuals, it is regarded as a key predisposing factor in obesity [10]. This imbalance of *Khilṭ-iBalghamī,* known as *Sū'-i-MizājBalghamī,* is linked to digestive disturbances, specifically an impairment in hepatic digestion *(Fasād-e-HaḍmKabidī)*. Excessive coldness *(Burūdat)* in the liver results in an overwhelming presence of phlegm *(Ghalaba'-i-Balgham)* in the blood, thereby disrupting metabolic processes [16, 17].

According to Galen *(Jālīnūs),* the materialistic cause *(AsbābMāddiyya)* of excessive fat accumulation is the presence of viscous substances (Dusūmat) in the blood, while the active cause is

coldness *(Burūdat),* which leads to the solidification of these substances resulting in fat *(Shaḥm)* deposition. This accumulation primarily occurs in naturally cold organs *(BāridA'ḍā')* or when an organ's temperament shifts toward excessive coldness [10]. An excess of coldness and increased fat levels contribute to vasoconstriction, causing the narrowing of blood vessels. This restriction and congestion *(Imtilā')* may elevate blood pressure, increasing the risk of vascular rupture anywhere in the body. Additionally, the impaired flow and penetration of vital energy (*Rūḥ*) into the organs in advanced stages of the disease result in fatal consequences [18].

***Asbāb-e-Mukhatira* (Risk Factors):**

Fasād*al-Haḍm* (Disturbed Digestion) [9]: Ali Ibn-e-Abbas Majoos*ī* (930-994 AD) identified various pathological conditions associated with excessive fat (Shaḥm). They have classified it as *Dasumat-e-Dam* with *Huzoom-e-Kabidī* abnormalities as the primary root cause of the accumulation of fat. Since the Greco-Arab period, Unani scholars have described *Shaḥm* (fat) as the final by-product of digestion (*Nuzj-e-Fazila*), which is derived from food. Once formed, this *Shaḥm* is distributed to different organs, serving as a source of nourishment [19, 20]. When the *Huzoom-e-Arba* process is disrupted, the proper digestion and absorption of nutrients are hindered. This impairment can occur at any stage of digestion, including the stomach (*Huzoom Ula*), liver (*Huzoom-e-Sani*), blood vessels (*HuzoomUrooqī*), or organs (*HuzoomUzwi*) [21]. A disturbance at any of these levels results in excessive and abnormal accumulation of phlegm (*Balgham*). The surplus *Balgham* increases coldness (*Burūdat*) in the body, causing it to solidify and deposit as fat.

***Ghidhā'* (DIET):**

Excessive Consumption of Cold and Moist Foods: The excessive intake of cold and moist foods, along with improper meal timing and insufficient food consumption after digestion lead to an increase in cold and moist humors. This also causes heightened coldness and moisture in the liver and stomach. As a result, the blood becomes rich in *Balgham*. The increased coldness leads to the formation of thick and sticky humors (*Ghaleez* and *LuzujAkhlat*), ultimately contributing to the production of *Shaḥm* (fat) [22].

Excessive Energy Intake: Even a small extra intake of calories every day, if continued for a long time, can lead to a lot of weight gain. For example, eating an extra 200g slice of bread daily or driving instead of walking for 20 minutes adds about 48 kcal (200 kJ) per day. Over 10 years, this small extra amount can add up to 20 kg of fat [23].

Ghidhā'KathīfQalīl al-Ghidhā' Radī' al-Kaymūs': Junk food has high calories, high fat, and high glycemic index. The food which is high in calories and fat, comes from *Ghidhā' KathīfQalīl al-Ghidhā' Radī' al-Kaymūs' (*diet of poor nutritional value producing bad humors and blood of thick consistency). *Radī' and KathīfGhidhā'* forms *Radī'Mādda* (morbid material) in the form of *GhaleezBalgham* in the body after metabolism. These *GhaleezBalgham* accumulates in the body in the form of fat, hence it causes obesity.

Sedentary Lifestyle [22]: A sedentary lifestyle is a major contributor to obesity. Globally, there has been a significant shift toward less physically demanding jobs. In both children and adults, excessive screen time, particularly watching television, has been linked to a higher risk of obesity. A review of studies found that 86% (63 out of 73) showed a direct correlation between increased media exposure and rising childhood obesity rates, with the risk increasing in proportion to the time spent watching television [24].

***Warzish Ki Kami* (Lack of Exercise):** A decrease in physical activity and prolonged sedentary lifestyle lowers the body's metabolic rate, contributing to obesity. A lack of exercise leads to physical inactivity, which slows down the body's natural functions. This slowdown negatively impacts blood circulation, digestion, and the removal of waste, increasing the risk of various health issues [11, 22, 25].

***Sukoon aur Neend ki ziyadati* (Excessive Rest and Excessive Sleep):** Sleep is analogous to rest, excessive sleep and excessive rest lead to an abnormal build-up of *BāridRatbMādda (Balgham)*. Too much sleep increases moisture (*Ruṭūbat*) in the body, while excessive rest also contributes to this moisture. When this *RatbMādda* combines with excessive coldness (*Burūdat*), it solidifies and accumulates as fat [11, 22, 25].

Others

Farhat-o-Rahat: *Farhat* refers to intense joy, happiness, or pleasure. When experienced in excess, it can lead to overindulgence in food, drinks, and other enjoyable activities, resulting in an excessive buildup of *balgham*, which contributes to obesity.

Similarly, *Rahat* signifies extreme comfort, relaxation, or leisure. Excessive *Rahat* encourages a sedentary lifestyle, reduced physical activity, and prolonged rest. This lack of movement leads to the accumulation of *BāridRatbMādda* (*Balgham*) in the body, ultimately causing obesity [22].

Nagma-o-Suroor: *Nagma-o-Suroor* refers to excessive listening to music and other pleasurable activities, which can promote a sedentary lifestyle. Overindulgence in such pleasures increases *Ruṭūbat* (moisture) in the body, ultimately contributing to obesity [22].

Soft Bedding and Soft Cloths: Soft bedding and soft cloths give comfort, excessive comfort increases *Ruṭūbat* (moisture) in the body and causes obesity [22].

Virasat (Genetics): Sometimes obesity is inherited from the family [22].

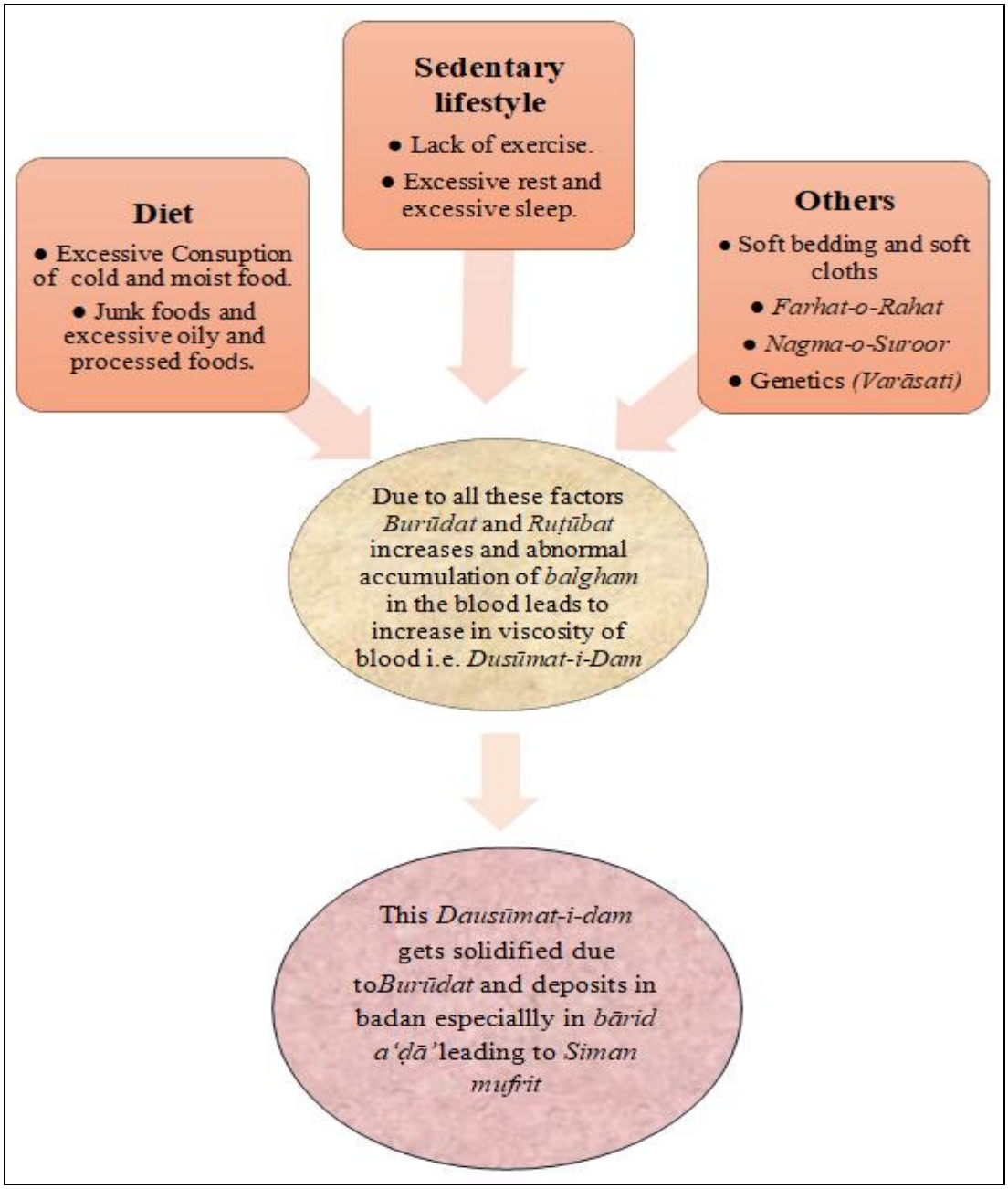

FIG. 1: UNANI *MAHIYAT* (PATHOPHYSIOLOGY) OF *SIMAN MUFRIT* (OBESITY)

***Awarizat* (Complications):**
Nervous System [11]:

a) *Bell's palsy*

b) *Ṣara'*

c) *Sakta*

d) *Ghashī*

e) *Fālij*

Cardiovascular System [11]:

a) **Palpitation: (*Khafaqān)*-**Sometimes *Ruṭūbat-e-balghamīa* ccumulated in the pericardium of the heart, resulting in a condition called palpitation.

b) **Atherosclerosis *(Tasallube Sharaeen)*:** Increase in the *Balgham* cause an increase in the viscosity of the blood and also constricts blood. Deposition of *Balgham* (atherosclerosis) impaired the passage of *Rūḥ, Nufuz* to the organs.

Respiratory System:
a) ***Zeequnnafs/RabwBalghamī*** Accumulation of *GhaleezBāridRuṭūbat* causes constriction of bronchioles [11, 22].

Gastrointestinal Tract:
Indigestion: The cause of the accumulation of fat in the body is due to the predominance of *balgham* in the blood. Due to this, it increases *Ruṭūbat* and *BurūdatKayfiyāt* of the body, causing *Sū' al-Haḍm* (dyspepsia). Indigestion is also accompanied by nausea and vomiting [9, 11, 22, 26].

Reproductive System:
In Female:

a) ***Isqāṭ-e-Hamal*** (Abortion)

b) ***'Uqr*** *(*Infertility) Excess production of *khilt-e-balgham* causes *Sū'-i-Mizāj* of the uterus, which results in a decrease of *quwwat e jaziba* and *masika* of the uterus, causing infertility and recurrent abortions [11, 22, 27].

In Male:
'Uqr (Infertility): *Excessive* accumulation of *balgham* also leads to disturbance in the production of testosterone, contributing to male infertility. According to modern physiology, cholesterol plays a vital role in the mechanism of testosterone production. Disturbance in cholesterol levels or metabolism can affect testosterone production [11, 22, 27].

Musculoskeletal System:
a) ***Waja' al-Mafāṣil*** (Joint Pain)

b) ***Taqleel e Harkat*** (restricted movement)-Siman-*Mufriṭ* (obesity) is a *balghami* disease characterized by loss of free movement of *A'ḍā'* due to deposition of *Shaḥm* [11].

Others:
Hemorrhage: Unani scholars stated that individuals with excess body fat are at a higher risk of blood vessel rupture. This is because the accumulated fat compresses the vessels and the risk is even greater if obesity develops at an early age [11].

Sudden Death: According to the renowned Greek philosopher and physician, *Siman Mufriṭ* (morbid obesity) narrows blood vessels due to increased pressure, leading to *Imtilā'* (vascular congestion) and obstructing *Tarwīḥ* (proper oxygenation). As a result, *Imtilā'* and *Adm-i-Tarwīḥ* (tissue anoxia) can cause sudden death at any stage of life. This condition aligns with modern medical complications observed in obese individuals, including hypertension, thrombosis, embolism, atherosclerosis, metabolic disorders, and heart disease [26].

CONCLUSION: Obesity remains a significant health threat and is indeed a complex and multifactorial condition that is increasing rapidly and contributing to significant metabolic and cardiovascular diseases. Chronic hyperphagia with insufficient metabolic activity renders the body fat, a case which is understood and well explained by Unani concepts as *Siman Mufrit,* inducing a *Khilṭ-i-Balgham* imbalance. Diagnosis based on BMI, profile of skin, thickness, waist-to-hip ratio are widely used for diagnosis in modern sciences, whereas the Unani system offers a comprehensive non-biased guidelines adopting *Mahiyat* (pathophysiology), *Asbāb-e-Mukhatira* **(**risk factors) involved in diabetes, and *Awarizat* (complications).

Understanding obesity through this lens provides a foundation for exploring alternative diagnostic perspectives and potential interventions. Future research should focus on correlating Unani pathophysiological concepts with modern biomedical findings, facilitating a more integrative approach to obesity assessment and management.

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