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### EFFECT OF SKIPPING BREAKFAST ON HEALTH – A SHORT REVIEW

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#### ABSTRACT

Breakfast is perceived to be healthy and even more important than other meals in a day. , breakfast is represented as the first meal consumed within 2 hours after the longest sleep in a 24 hour cycle and this reflects the longest daily duration spent in a fasting stage. Researchers observed that breakfast eaters tend to be physically more active in the morning compared to breakfast skippers and eat later in the day. Breakfast intake replenishes the glycogen stores and stabilizes the insulin levels. Lack of breakfast induces hypoglycemia along with increased hunger, increased mental irritation and fatigue. Skipping breakfast increases the susceptibility to increase weight gain and increased risk of heart disease, atherosclerosis, hypertension, obesity and diabetes. Breakfast skipping also slows down the metabolism of the cells. Breakfast helps in burning good calories. Influence of skipping breakfast in children at school tends to be less active and expend low energy for the whole day compared to regular breakfast consumers. Another study observed that skipping breakfast had an adverse effect on academic performance, class attendance, mood changes and emotional status in childhood and adolescent age groups. So, a healthy breakfast is always necessary for a good start in the morning.

## INTRODUCTION

Breakfast as per the term means breaking the midnight fast. Breakfast is perceived to be healthy and even more important than other meals in a day. One causal finding is that there is no universally accepted definition for breakfast. Consumption of breakfast is considered to be more important for general health of a person than physical exercise and for a healthy lifestyle. (Cahill *et al.*, 2013). Among many contraries, breakfast is represented as the first meal consumed within 2 hours after the longest sleep in a 24 hour cycle and this reflects the longest daily duration spent in a fasting stage. (Rugeet *et al.*, 2009; Cahill *et al.*, 2013)

### Importance of breakfast

This food replenishes the glucose supply to the cells and provides other essential nutrients and boosts the energy levels and creates alertness and good mood. During a fasting state, the liver breaks glycogen and releases glucose into the bloodstream. Thus, always maintaining a stable blood glucose is very important in the morning to keep the brain active. But during fast after 12 hours, the glycogen stores will be low and will be used up soon and fatty acid break down begins. But for this process, carbohydrate is also necessary without which fatty acids can be partially oxidized. This can lower down the energy levels in a morning activity. At that time, eating breakfast can keep our glycogen levels ready (Website, no date a)

The human body utilizes a lot of energy stores that will be important for growth and repair of tissues through the night. So, having a balanced breakfast helps to pop up our energy process and also improves protein and calcium balance.

Skipping breakfast is a process that can lower down overall energy intake. But, researchers observed that breakfast eaters tend to be physically more active in the morning compared to breakfast skippers and eat later in a day. Skipping breakfast is considered to be very common in a recent survey based on nutrition of children and adolescents of Australia. Most of them were females who were underweight or overweight, with low physical activity, insufficient sleep and the common causes were to lose weight, bored of breakfast and cost cutting and cultural beliefs. (Website, no date a)

Many clinical trials were conducted by researchers to answer the question that breakfast is considered to be the important meal of the day. Research evidence was not clearly supporting the fact that regular consumption of breakfast or skipping breakfast had an influence on metabolic rate, body mass and composition, nutrition induced thermogenesis. Studies by Betts *et al.* reported adults who were both lean and obese expended low energy in the morning when they did fasting than when they consumed a good prescribed breakfast (Betts *et al.*, 2016)

A pilot study conducted by researchers observed that intermittent fasting improves insulin sensitivity and lowers blood sugar level and arterial blood

pressure. 80 subjects who were prediabetes and were divided into groups of two different eating schedules. Group 1 – eating a good calorie diet between 9.00 and 15.00 and Group 2- eating the same calories over 12 hours. The group I which confounded to eat a good calorie diet between 9.00 and 15.00 were on par with medicine that decreases blood pressure.(Gonzalez, 2018)

Skipping breakfast is considered to be greatly associated with a consideration of consuming food of very low nutritional value and is also accompanied with high energy density. It can also increase appetite and increase the tendency to consume larger portions of food in subsequent meals during the day. Thus, has been an assumption that skipping breakfast results in overconsumption of food in the next part of the day and increases positive energy balance and weight gain over time. But researchers did not support this assumption. Majority of studies reported that there is no difference or there was a marginal increase in energy intake at subsequent meals like lunch and dinner. But the increase in energy intake caused by breakfast is significantly lost in breakfast skipping, (Javier T.Gonzalez)

A study conducted among 10-17 years of Latino adolescents where breakfast was consumed as food or beverage between 0500 and 1000 h and a total energy release was  $\geq 100$  kcal. The results revealed that the participants who skipped breakfast were characterized by a lower amount of energy release compared to participants who ate breakfast occasionally. And also they observed that occasional consumption of breakfast in adolescents are m

ore associated with lower visceral adiposity (Suliga, 2014; Gonzalez, 2018)

A study conducted a research on 70 lean and 70 obese adults who were not working under night shifts. One third of the participants consumed 50Kcal within 2 hours of waking on most of the days and they were considered as breakfast skippers. These participants were involved in an experiment Bath Breakfast Project where they were divided into habitual breakfast consumers and breakfast skippers for 6 weeks. This experiment was specifically designed primarily to analyse individual aspects of energy balance as opposed to long duration induced weight-change. In this type of experiment, there was no significant difference in loss of weight over a period of 16 weeks in participants who were recommended to eat or skip breakfast. there was also no significant difference in change in body mass between breakfast in takers versus fasting participants among people who were either lean or obese.(Betts *et al.*, 2011)

The influence of meal skipping has an impact significantly on the outcome of weight loss and affects the physiological and behavioral aspects of a person. Frequency of Daily meals and breakfast skipping are considered as important factors that are linked to the risk for obesity and overweight and obesity in people of UK, USA, and Australia. This risk is greatly associated with female population, older age, lower socioeconomic status and urban environments. (Siega-Riz, Popkin and Carson, 1998; Delva, O'Malley and Johnston, 2006)

The possible mechanism that links the risk factor is not well established in scientific reports. Breakfast skipping plays an important role overweight and this

can be attributed to the other factors that influence the body mass index like parental involvement in food decisions. Among many other factors that associate breakfast and obesity, intake of vegetarian diet or both vegetarian and non-vegetarian diet did not significantly affect the weight status of subjects.

A study was conducted to analyze the prevalence of skipping breakfast and incidence of obesity by a retrospective analysis in 186 patients visiting a metabolic clinic. A questionnaire based on dietary factors, physical activity and exercise schedule, 24 hour dietary recall method of food consumption and anthropometric measurements was assessed. Results shows that the breakfast skipping was observed in about 132 (71%) of the patients and among them 84 patients (63.6%) were under obese group and 48 patients (36.3%) were under in normal BMI group. Another observation was that regular breakfast eaters had significantly lower levels of BMI compared to participants who skipped breakfast. It also revealed that over weight is high in females compared to male and this prevalence was more in subjects who consumed more than recommended calories compared to participants who took few or recommended calories in a day. (RakshaGoyal, 2018)

### **Nutritional effects of skipping breakfast**

Many reviews have worked on skipping breakfast on nutritional effects of skipping breakfast. Breakfast intake replenishes the glycogen stores and stabilizes the insulin levels. Lack of breakfast induces hypoglycemia along with increased hunger, increased mental irritation and fatigue (Adolphus, Lawton and Dye, 2013). Skipping a breakfast increases the susceptibility to increase the weight gain and increased risk of heart disease, atherosclerosis, hypertension, obesity and diabetes. (Uzhova *et al.*, 2017)

The increases in blood pressure levels also triggers occurrence of migraines and headaches. (Website, no date b; Uzhova *et al.*, 2017)

A study conducted by Harvard University of Public health to observe that skipping a breakfast increases the risk of Type- 2 Diabetes mellitus. The study was performed on 46,289 women for 16 years. The results confounded that women who had the habit of skipping the meal increased the risk of developing type-2 diabetes compared to women who regularly had breakfast. (Website, no date c)

A study conducted by Cahil *et al.*, for 16 years to evaluate the effects of skipping breakfast meal. The results found that men who skipped breakfast were 27% more likely to present with coronary heart disease, heart attacks and even die early. (Cahill *et al.*, 2013)

Studies have observed that regular breakfast intake tends to be healthy with a reduced chance of getting overweight, obese with lower risk of various chronic diseases. (Deshmukh-Taskaret *et al.*, 2010). According to recent research by Cancer

Research at UK, a person who is considered as overweight or obese had an increased risk of developing cancer. (*Website*, no date d)

Breakfast skipping also slows down the metabolism of the cells. Breakfast helps in burning good calories. Skipping it increases the tendency to store many calories to prepare the body for starvation. So, the metabolism also slows down and glucose starts to get stored in muscles as a backup during fasted state and muscles undergo wasting. (*Website*, no date e)

Impaired mood and energy levels

Avoiding breakfast produces a negative impact on energy levels and mood. A study led by British team performed a study on 144 healthy people who were made to undergo fasting. The participants were divided into three groups and on the next day one group was asked to skip breakfast, the second group was given moderate breakfast and the third group was given only coffee. The participants were observed for some hours. The results observed that participants who skipped meals had lower memory skills and more fatigue. There were no significant differences between the other two groups. Thus, skipping breakfast swishes down energy levels of a person and impairs his memory (*Website*, no date e, *Website*, no date f)

Skipping breakfast induces hair loss

Breakfast is a very essential meal of a day because it gives nourishment to hair follicles to grow. One of the major harmful effects of skipping breakfast is loss of hair. Loss of a meal very harmful affects the protein levels and keratin. Hair consists of keratin, that gives a tensile strength. A diet with very little protein like fish, eggs, red meat and chicken is likely to affect the keratin levels. The hair loses its strength and stops growing. Thereby prevents hair growth and triggers loss of hair. So a protein rich breakfast could prevent hair fall. (*Website*, no date g).

### **Skipping breakfast habits in children**

Influence of skipping breakfast in children at school tends to be less active and expend low energy for the whole day compared to regular breakfast consumers. Studies reported that a good caloric meal consumed in the morning could be less compensated with lower calorie intake in the later part of the day and maintains good energy balance. (*Website*, no date g; Wang *et al.*, 2017); Ostachowska-Gasior, 2016)

Few researchers have documented that persons who skip breakfast consumed more calorie at night in the afternoon, that is they increase their intake by 20-30 % as a compensation for the lack of break fast ((*Website*, no date h; Levitsky and Pacanowski, 2013) )

Skipping a meal at school level also has more influence on children. A study was conducted among 1566 school students in the age group of 11-13 years of fourth

and fifth grade from an elementary school. This study was a cross sectional study that assessed the lifestyle behaviours like dietary habits, physical activity and screen time, nutrition knowledge and socioeconomic correlates related to skipping breakfast were assessed. Data related to food item selection, sociodemographic factors were self reported by a questionnaire. Results revealed that type of consumption of breakfast, number of days in a week and number of school days per week. BMI was also assessed and it was considered as a marker of obesity. Results revealed that 17.4% of teenagers skipped their breakfast for 4-7 days per week, 12.9% skipped breakfast frequently skipped meals at school for 3-5 days in a week and 43.6% skipped both meals a few times a week. And also they observed that frequent breakfast skippers were more prone to be overweight or obese with central obesity and adiposity. Children who skipped both meal were likely to be overweight and obese. Thus, the study concluded that a larger population of children usually skipped breakfast a few times a week. This tendency increases the risk of general adiposity and also adds more support to the fact that skipping breakfast is associated with central obesity. (*Website*, no date h)

A poorer quality of diet in breakfast skippers was associated with worse food choices, like lower consumption of dairy products, cereals, fruits and vegetables, more consumption of high energy snack foods. This type of diet has caused a low intake of minerals, vitamins, protein and fibres etc..(Bellisle *et al.*, 2018)

### **Who is more commonly prone to skip breakfast**

Across the world, skipping breakfast was found to be more frequently reported by girls as well as older school-age children. These children are imposed with lower socioeconomic status in the family, impaired functioning of the family and single parent families.(Bellisle *et al.*, 2018; Gibney *et al.*, 2018; Monzani *et al.*, 2019). The various reasons that make children to skip breakfast are lack of time in the morning while starting to school, no desire to take food. Numerous reasons for skipping breakfast were given, including the lack of time in the morning, no desire to eat food and impaired weight control and this tendency is more in females

Another study worked on the hypothesis whether skipping breakfast had an adverse effect on academic performance, class attendance, mood changes and emotional status in childhood and adolescent age groups in 100 first year medical students at Princess NourahBintAbdulrahman Women University, Riyadh. The study used a questionnaire to assess the type of breakfast they took, reasons for skipping it, their negative feelings and academic performance of the students. The results revealed that 40 % of students had the habit of skipping breakfast and 60 % took only lunch and their reasons were multiple lifestyle habits. They also reported that those students had a more negative emotional status. Thus, they concluded that breakfast is important not only for good nutrition, but also had an impact on academic performance and behaviour. (A, Javaid and Munir, 2018)

During skipping breakfast, a decrease in carbohydrate intake in morning results in hypoglycemia because glucose is a good energy source. This hypoglycemia

significantly affects the ability to focus on academic work and impaired academic performance on mental issues and impaired physical activity. (Scholey, Harper and Kennedy, 2001; A, Javaid and Munir, 2018)

Breakfast Skipping on modulation of Appetite by peripheral hormones:

Appetite is a symptom of hunger that can be posed by numerous intestines. One important motivator of appetite is the hormone ghrelin. Other hormones that cause a sense of satiety like glucagon-like peptide-1, glucose-dependent insulinotropic polypeptide, peptide YY, cholecystokinin, and leptin are also associated with this appetite. These hormones increase the constancy of energy stability. Skipping a breakfast induces an instability of energy maintenance. ([Website ; Website](#)) Another study by Astburg et al reported that secretion of orexigenic hormones like glucagon-like peptide-1, and peptide YY of higher 30 mins if a 1,050-kJ liquefied meal is consumed 2 and ½ hours after intake of breakfast. (*Website*, no date i)

## CONCLUSION

Breakfast, the first meal consumed within two hours after prolonged sleep for a 24 hr cycle is an essential meal for a day. Skipping Breakfast is reported as an unhealthy approach by many scientific reports. The rate of skipping morning meals is highest during young adulthood, which is a period of transition and development in a person's life. Though the reasons that skip breakfast may be multiple, it paves way to increase the risk of chronic diseases. So, a healthy breakfast is always necessary. In case of lack of time, a protein shake is often recommended. Growing children should never miss their breakfast as it affects their academic performance and mood. Diabetic patients should have a good morning meal as it sensitizes release of insulin. Thus a good , energy and protein rich breakfast is always necessary for a good and energetic morning activity.

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