

Women's Body Mass Index (BMI): An Analysis of The Covid 19 Lockdown Case

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Abstract: The global coronavirus disease pandemic, or COVID-19, began to spread in 2020. To avoid infection, several countries have implemented lockdown or stay-at-home regulations. From March to May 2020, Bangladesh was in lockdown, with internal travel limited. Women's health may be harmed by such long and strict confinement. The goal of this study was to compare women's health before and during the COVID-19 pandemic in order to estimate the influence of the pandemic on their health. A prospective longitudinal study in two areas in Dhaka city was conducted. The women in the research were married but not pregnant. Overall 20 non-pregnant women had regular checkups before and during the COVID-19 pandemic, from October 2019 to January 2020 and October 2020, respectively. The medians of body mass index were compared to those during the 2019 health checkup. Their health may have been harmed by the lack of physical activity and other inconveniences brought on by their long confinement. This study has a variety of sociodemographic characteristics, including reported mental health issues, sleep problems, physical problems, and social behaviors that may be related to BMI, eating patterns, and physical activity. Additionally, there is compelling evidence that their physical and routine activity, weight, and other relevant factors are altering. Therefore, the current study aimed to highlight perceived changes in BMI, eating patterns, and the physical activity level among married women in Bangladesh between "before" and "during" the COVID-19 lockdown. There were elements of both qualitative and quantitative research procedures incorporated into the study, making it a mixed-methods investigation. The research was quantitative in nature, and its purpose was to quantify the data that was gathered and to generalize the findings from a sample to the entire population. In addition, it was qualitative since the research endeavored to derive more profound interpretations from the findings by employing qualitative methods such as conducting in-depth interviews. The majority of the processing and evaluation of the information that was received from the Google Forms questions was done through the use of electronic methods. All of the information that was obtained from the surveys was manually entered into the spreadsheet software that was provided by Google Excel. Also, the program gave the researchers the ability to select a large number of fields and construct a variety of charts, which allowed them to investigate the correlations between a number of different variables.

Among the 20 subjects, the majority of them experienced significant weight gain, but there was little change in BMI between "before" and "during" the Covid 19 lockdown. A clear sense of food patterns, the prevalence of inactivity, and a number of other significantly impacting factors were also demonstrated by the current data.

Keywords: Body mass index (BMI), BW Body weight, COVID-19 Coronavirus disease 2019

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1. Introduction

Since its inception in December 2019, the (COVID-19), caused by a lethal and pathogenic acute severe respiratory syndrome coronavirus, has continued to wreak havoc on our society, affecting not only individual lives but also global systems ranging from international trade to national policies. The World Health Organization (WHO) proclaimed this viral attack a pandemic on March 11, 2020, in light of the catastrophic global scenario marked by a rapid increase in infections, mortality, and morbidity (Coulthard et. al., 2021). The pandemic continues worldwide despite the efforts of both local governments and international organizations. In the meantime, many anti-epidemic methods, such as social distance, lockdown or shutdown, confinement, quarantine, etc., were devised to combat the devastation and obstacles posed by COVID-19 (Pietrobelli et. al., 2020).

Bangladesh's comparatively inadequate facilities for health care and institutional capabilities have made the country prone to the COVID-19 pandemic. However, on March 8, 2020, Bangladesh reported its first COVID-19 cases, and on March 26, 2020, the Bangladeshi government proclaimed lockdowns with many new restrictions and extended these announcements throughout several time slots. To prevent the spread of the virus, a statewide emergency was declared, which included the closure of all kinds of educational institutes, in accordance with WHO and other local medical experts' recommendations (Kikuchi et. al., 2022).

However, these protracted confinements at home have significantly impacted socioeconomic position, as well as mental and physical habits.

The COVID-19 quarantine and its indisputable laws substantially impacted the everyday routine and activities of humans, including their eating patterns, nutritional preferences, and physical and weight-related behaviors. Even while the huge effect of the COVID-19 epidemic on physical exercise and weight is still unclear, a research in Italy indicated that during lockdown, individuals consumed more unhealthy foods and engaged in less physical activity (Huber et al., 2021).

No study has examined how the COVID-19 lockdown affected the BMI, eating patterns, and level of physical activity among Bangladeshi citizens, especially married women. We studied a variety of sociodemographic characteristics, including reported mental health issues, sleep problems, physical problems, and social behaviors that may be related to BMI, eating patterns, and physical activity. Additionally, there is compelling evidence that their physical and routine activity, weight, and other relevant factors are altering. Therefore, the current study aims to highlight perceived changes in BMI, eating patterns, and the physical activity level among married women in Bangladesh between "before" and "during" the COVID-19 lockdown. The changing nature of body weight of women during lockdown time in comparison to the previous body weight.

The objectives of this study are- To explore the body mass index of women; To explore the effect of Covid19 on home confinement eating habit; To explore a scenario of lifestyle changes of women health.

2. Background of the Study

The COVID-19 coronavirus pandemic which started in 2020 has affected every country in the world. Several nations have put in place stay-at-home or lockdown laws to prevent contagion. Bangladesh was under lockdown from March to May 2020, and domestic travel was restricted. Such rigorous and prolonged confinement may be harmful to a woman's health (Mohiuddin, 2020). This study aimed to compare the health of women before and during the COVID-19 outbreak in order to evaluate the pandemic's impact on their wellbeing. We carried out a large prospective study in two areas in Bangladesh's Dhaka district. The study's participants were married but not carrying children. Visits to the homes of all eligible women included invitations to regular checkups. We evaluated their health at the checkup camps and conducted questionnaire interviews.

Over the course of the COVID-19 pandemic, from December 2019 to January 2020 and from March 2020 to October 2020, respectively, 20 non-pregnant women had routine checkups. The body mass index medians were contrasted with those from the 2019 health examination. The insufficient physical exercise and other problems brought on by their prolonged imprisonment may have affected their health.

Literature Review Based On BMI Study:

The first paper is about the Impact of Prolonged COVID-19 Lockdown on Body Mass Index, Eating Habits, and Physical Activity of University Students in Bangladesh. It analyzes the variations in BMI among college students "before" and "during" the COVID-19 lockout, and determine how that different sociodemographic, mental, and interpersonal behaviors relate to BMI variations. The research also sought to determine whether there was a relationship between various socio-demographic traits and eating patterns and physical activity during the COVID-19 lockdown. A clear sense of food patterns, the prevalence of inactivity, and a number of other significantly impacting factors were also demonstrated by the current data. Moreover, direct comparisons of these findings may be difficult in the prevailing context due to limited evidence or lack of study on Bangladeshi university students in similar settings (Hossain et. al., 2022).

The second paper is about COVID-19 lockdown consequences on body mass index and perceived fragility related to physical activity. It was a world-wide case study. This research showed that whereas male individuals were slightly overweight both before and after the lockdown, female participants had healthy weight BMI levels both before and during isolation. Male individuals continued to be slightly overweight while female participants remained in the healthy weight category, despite the fact that BMI only marginally increased during isolation for both categories. Numerous studies for both genders proved weight increase, which is frequently associated to its contributing variables and examined throughout the pandemic, and all of them raised awareness about the significance of nutritional status for a healthy lifestyle (Urzeala et. al., 2022).

The third paper is about Eating in the lockdown during the Covid 19 pandemic; self-reported changes in eating behavior, and associations with BMI, eating style, coping and health anxiety. The article used a cross-section survey to assess self-reported changes in eating habits and behavior during the lockdown in the UK, as well as relationships with

BMI, demographic factors, eating styles, health anxiety, food insecurity, and coping mechanisms. Through social media advertising, participants (N = 620) were found online. The findings revealed that throughout the sample, self-reported alterations in food consumption occurred during the lockdown. Adaptive coping mechanisms were connected with increases in healthy eating habits, such as consuming more freshly cooked meals and fruits and vegetables (Coulthard et. al., 2021)

3. Background of the Study Area:

The participants in our prospective longitudinal study were married women who had not yet been pregnant at the time of our investigation. The research was carried out in two different regions of Dhaka, which are both located in Bangladesh. We conducted interviews with women who informed on their health checks in October 2019, January 2020, and October 2020. The interviews also took place in October 2020. During the health screenings, we questioned patients in order to have a better understanding of how the epidemic had impacted their lives. We chose the Cantonment Thana and the Gulshan Thana, both of which are located in the Dhaka District. Cantonment Thana is a Thana in the Dhaka district of Bangladesh's Division of Dhaka. Along with the Air Force Headquarters, it also contains the Army and Naval Headquarters. Its population is 36540, and its entire area is 14.47 km². The majority of foreign missions are situated in the Gulshan Thana region, which is referred to as the New Dhaka. In addition, a significant residential area has been created there (Maltoni et. al., 2021).

3.1 Physical Setting of the Study Area:

The physical setting of my research's study area: Cantonment Thana and Gulshan Thana are given below and map of Cantonment Thana and Gulshan Thana are shown in figure.

3.2 Cantonment Thana:

The coordinates of Cantonment are 23.8222°N 90.4083°E. With a total area of 11.52 square kilometers, Cantonment Thana (Under Dhaka District) is bordered by the Uttara Thana on the north, the Kafrul and Gulshan Thanas on the south, the Uttara and Badda Thanas on the east, and the Kafrul and Pallabi Thanas on the western.

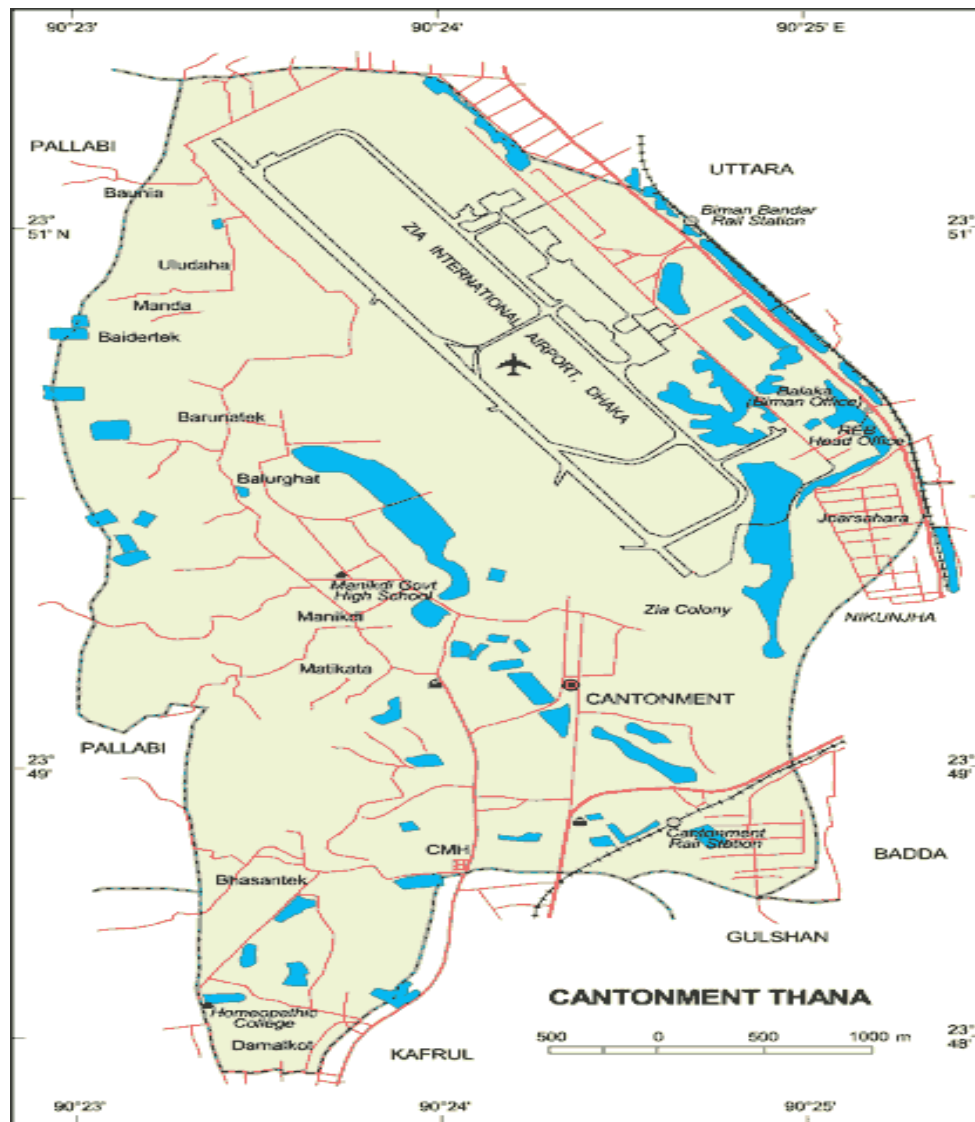


Figure 01: Cantonment Thana (Source: maps-of-bangladesh.blogspot.com)

3.3 Gulshan Thana

With a total area of 40.91 sq. km, Gulshan Thana (Under Dhaka district) is bordered on the north by the cantonment and badda thanas, on the south by the tejsaon and khilgaon thanas, on the east by the badda Thana, and on the west by the Kafrul Thana. The majority of foreign missions are situated in the Gulshan Thana region, which is referred to as the New Dhaka. In addition, a significant residential area has been created there.

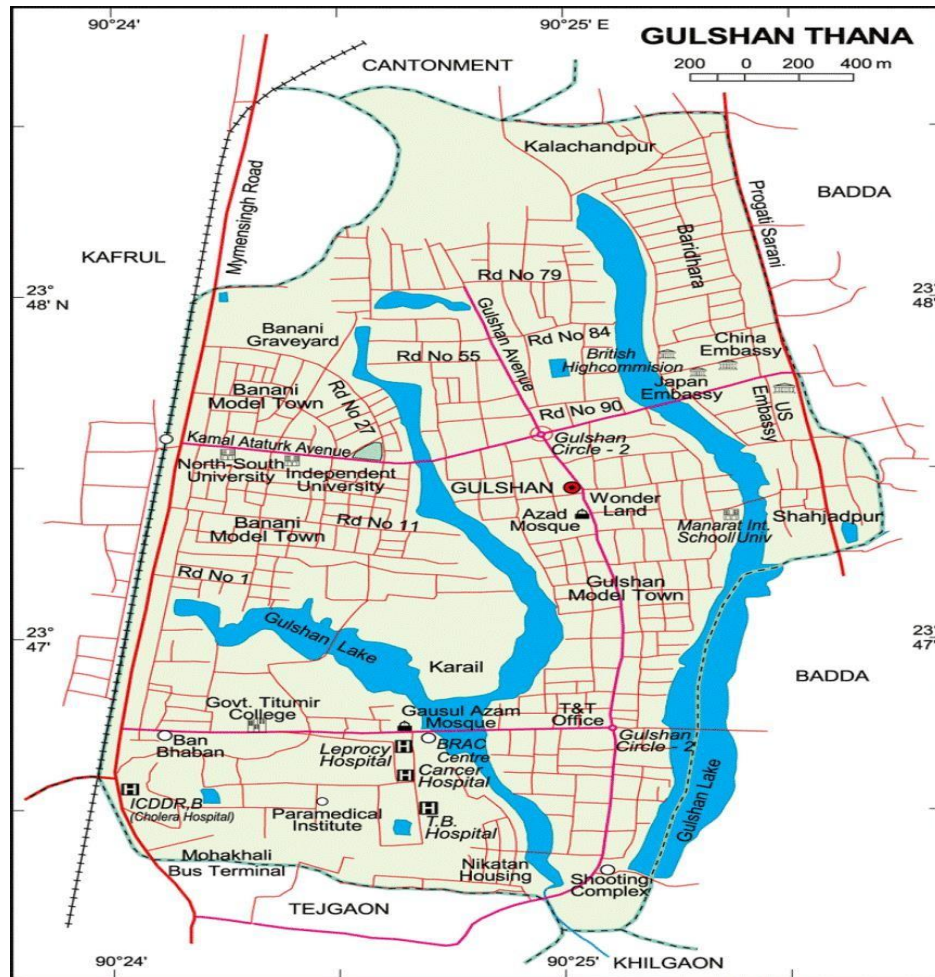


Figure 02: Gulshan Thana (Source: maps-of-bangladesh.blogspot.com)

3.4 Survey Areas Under Cantonment and Gulshan Thana

This study is based on two thana of Dhaka City which are Cantonment and Gulshan thana. But this study doesn't cover up the whole Cantonment and Gulshan thana. Some areas under these two thanas are selected for this survey. Under Cantonment thana, this study survey covers up the Baunia, Mirpur Dohs, Ecb Circle and Kalshi areas which are pointed in the Figure 3 with purple colored circle points. Again, under Gulshan thana, this survey covers up the Kalachandpur, Shahzapur and Gulshan Avenue areas which are shown in the figure 3 with red colored point. So the participants of this survey study reside in these pointed places.

Cantonment and Gulshan Survey Area

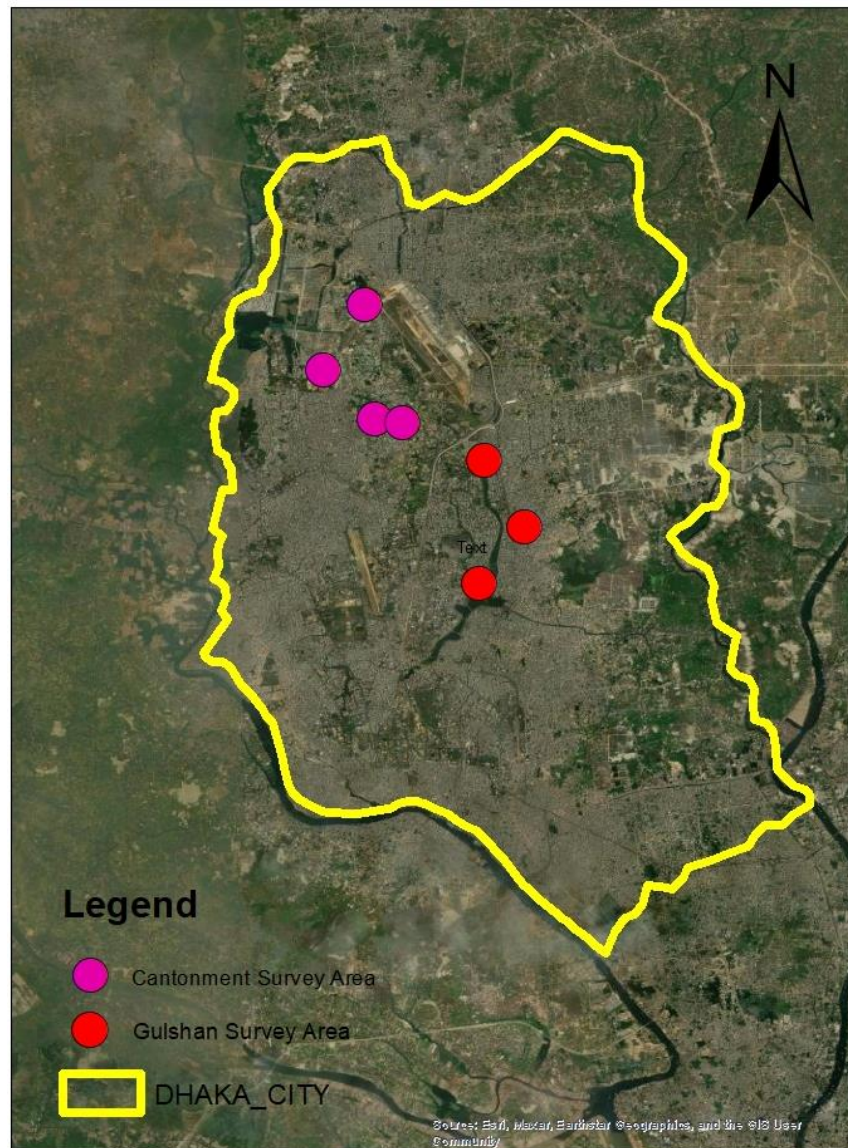


Figure 03: Survey Areas under Cantonment and Gulshan Thana (Source: authors, 2023)

4. Methodology

The methodology of a study research or project includes the steps of gathering data and also the stages of developing systematic guidelines, etc (Al Zaman, 2020). In this study work, a number of different data sources and methodological approaches are utilized. The approach of an investigation is what determines whether or not it is successful. The results of the research are dependent on the works of systematic analysis as well as

critical evaluation. The systemic surveying, the research design, and the methodologies that were used for collecting and analyzing data are the primary topics that will be discussed in this chapter's in-depth look at the research process.

5. Data And Methods:

5.1 Data:

Socio-demographic Information of the Participants

Total 20 participants were conducted the study. The socio-demographic information is shown in the table given below:

Table 1: Socio-demographic Table

Sociodemographic variables	Frequency (n=20)	Percentage
Age		
20-40	9	45%
40-60	11	55%
Educational Status		
Graduate	10	50%
Intermediate	7	35%
High School	3	15%
Professional status		
Job Holder	6	30%
Housewife	14	70%
Family Status		
Nuclear	17	85%
Extended	1	5%
Joint	3	15%
Socio-economic Status		
Higher Class	10	50%
Middle Class	10	50%
BMI (kg/m²)		
Underweight	1	5%
Normal weight	9	45%
Over weight	7	35%
Obese	3	15%

(Source: authors, 2023)

5.2 Methods

There were elements of both qualitative and quantitative research procedures incorporated into the study, making it a mixed-methods investigation. The research was quantitative in nature, and its purpose was to quantify the data that was gathered and to

generalize the findings from a sample to the entire population. In addition, it was qualitative since the research endeavored to derive more profound interpretations from the findings by employing qualitative methods such as conducting in-depth interviews. The majority of the processing and evaluation of the information that was received from the Google Forms questions was done through the use of electronic methods. All of the information that was obtained from the surveys was manually entered into the spreadsheet software that was provided by Google Excel. Also, the program gave the researchers the ability to select a large number of fields and construct a variety of charts, which allowed them to investigate the correlations between a number of different variables.

Calculating BMI

All participants in this survey were required to complete out two weights: one for "before COVID- 19 lockdown" and the other for "during COVID-19 lockdown." According to the WHO expert consultation, the score for Asian people are: underweight (BMI: >18.5 kg/m²), normal weight (BMI: 18.5-24.9 kg/m²), overweight (BMI: 25-29.9 kg/m²), and obesity (BMI > 29.5 kg/m²). Each participant's BMI was calculated from the ratio of their weight (kg)/height (m²) Mohiuddin (2020).

Using formula for BMI:

The BMI is computed by multiplying the height in meters squared by the body weight in kilograms.

Formula:

$$BMI = weight(kg)/height(meter)^2$$

6. Findings and Result

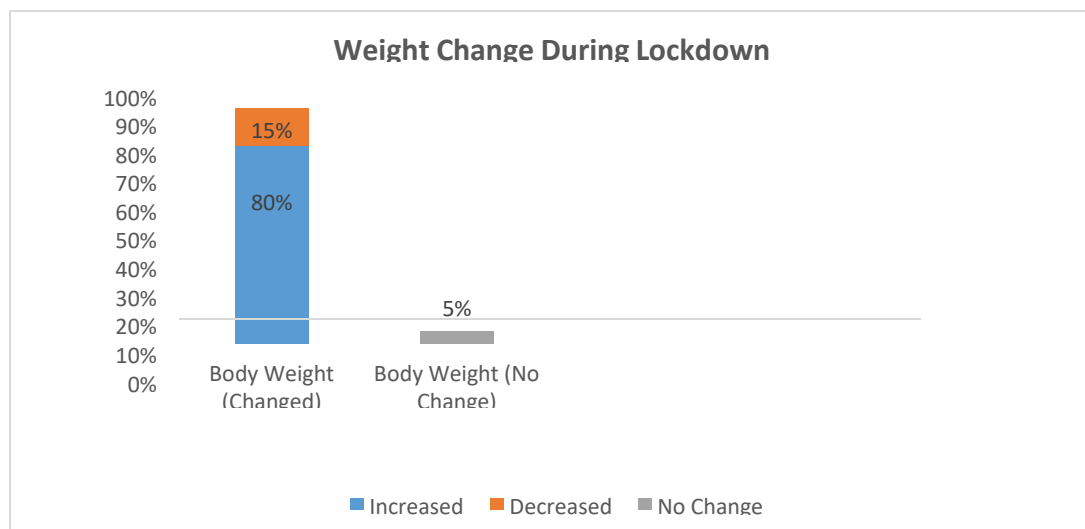
6.1 Change of Body Weight

During the lockdown period, most females gained body weight in their home confinement. We have surveyed total 20 female's information about body weight, physical and other activities who were married and non-pregnant. We have conducted the survey by asking some questions through questionnaire in which information like previous body weight, body weight during Covid 19 lockdown period, their height, other physical activities etc. Among 20 female, 85% women (17 female) gained weight and 15% women (3 female) loosed weight during the lockdown period. We have conducted the survey of women whose age are from 20-60 years. About 85% women gained weight but the rest 15% women who loosed weight, their age is above 40years old. Women who gained weight, their body weight increased from at least 2.70% to maximum 7.27%. On the other hand, women who loosed their weight, their body weight decreased 3.64% to 6.58%.

Table 2: Change of Body Weight

study ID	Age	Previous Body Weight(kg)	Body Weight during Lockdown (kg)	Weight Increased (In %)	Weight decreased (in %)
1.	48 Years	65	67	3.08%	-
2.	32 Years	60	62	3.33%	-
3.	26 Years	65	67	3.08%	-
4.	38 Years	68	73	7.35%	-
5.	56 Years	70	72	2.86%	-
6.	45 Years	74	76	2.70%	-
7.	60 Years	58	60	3.45%	-
8.	44Years	62	65	4.84%	-
9.	49 Years	85	91	7.06%	-
10.	46 Years	58	58	-	-
11.	54 Years	76	71	-	6.58%
12.	46 Years	56	58	3.57%	-
13.	25 Years	61	63	3.28%	-
14.	28 Years	56	58	3.57%	-
15.	25 Years	57	61	7.02%	-
16.	25 Years	45	48	6.67%	-
17.	41 Years	55	53	-	3.64%
18.	50 Years	59	56	-	5.08%
19.	33 Years	60	63	5%	-
20.	50Years	55	59	7.27%	-

(Source: authors, 2023)

**Figure 4: Weight Change during lockdown** (Source: authors, 2023)

Weight Change during lockdown:

Among the 20 participants, 5% women had no change in body weight and 95% women had change in their body weight during lockdown. Among 95% women who had change in weight during lockdown, 80% women's weight increased and 15% women's weight decreased. (Showing in figure 4)

Comparison of "Before" and "During" Covid 19 lockdown Body Mass Index:

Among the 20 participants, 5% women (1 woman) had underweight, 45% women (9 women) had normal weight, 35% women (7 women) had overweight, and 15% women (3 women) had obese according to their previous BMI. Among total 20 women, BMI of 30% women (6 women) had changed. On the other hand, the rest 70% women gained weight but their BMI didn't changed. 30% women whose BMI had changed, among them 66% women (4 women) gained over weight from normal weight, 1 women got obese from overweight and another 1 woman gained normal weight from underweight during the Covid 19 lockdown. So we can see that among the 20 participants, most of them gained weight significantly but, the change of BMI didn't come up significantly from 'before' to 'during' Covid 19 lockdown.

Table 3: Comparison of BMI changing

Participants	Previous BMI	Following BMI	BMI changed?
1	27 (overweight)	28.3 (overweight)	No
2	24.3(normal weight)	25.2 (overweight)	Yes
3	24.28(normal weight)	25.5 (overweight)	Yes
4	24.4(normal weight)	26.2 (overweight)	Yes
5	30.3 (obese)	31.3 (obese)	No
6	28.2 (overweight)	29 (overweight)	No
7	25.1 (overweight)	26 (overweight)	No
8	26.8 (overweight)	28.1 (overweight)	No
9	31.2 (obese)	33.4(overweight)	No
10	24.1(normal weight)	24.1(normal weight)	No
11	33.8 (obese)	31.6 (obese)	No
12	21.9(normal weight)	22.7(normal weight)	No
13	24.7(normal Weight)	25.6 (overweight)	Yes
14	22.9(normal weight)	24.1 (normal weight)	No
15	28.4 (overweight)	30.6 (obese)	Yes
16	17.6(underweight)	18.8(normal weight)	Yes
17	23.8(normal weight)	22.9(normal weight)	No
18	26.6 (overweight)	25.2 (overweight)	No
19	26 (overweight)	27.3 (overweight)	No
20	23.8(normal weight)	25.5 (overweight)	Yes

(Source: authors, 2023)

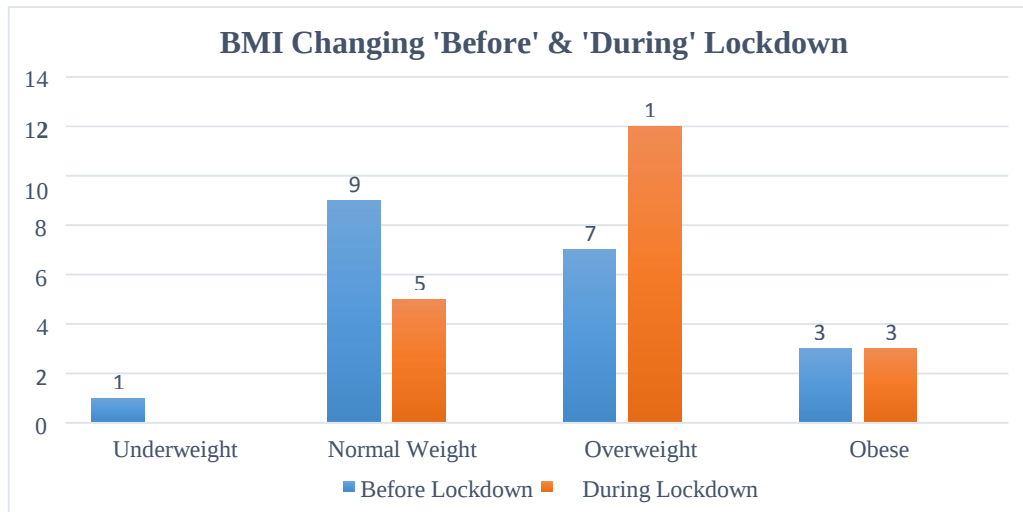


Figure 5: BMI Changing 'Before' & 'During' Lockdown (Source: authors, 2023)

BMI Changing 'Before' & 'During' Lockdown

Figure 2 is showing BMI Changing 'Before' & 'During' Lockdown. It is shown that before lockdown the number of underweight woman was 1. But during lockdown there was no underweight person. That means that 1 underweight woman had gained weight. Before lockdown, the number of normal weight women was 9 whereas during lockdown this number was 5. That means during lockdown women of normal weight has decreased. Again, before lockdown, the number of overweight women was 7. But during lockdown the number increased into 12. That means during lockdown, most women gained overweight and their BMI increased. At last it is shown in the figure that before and during lockdown the number of obese women was same. So this is how BMI changed before and during lockdown shown in the figure 5.

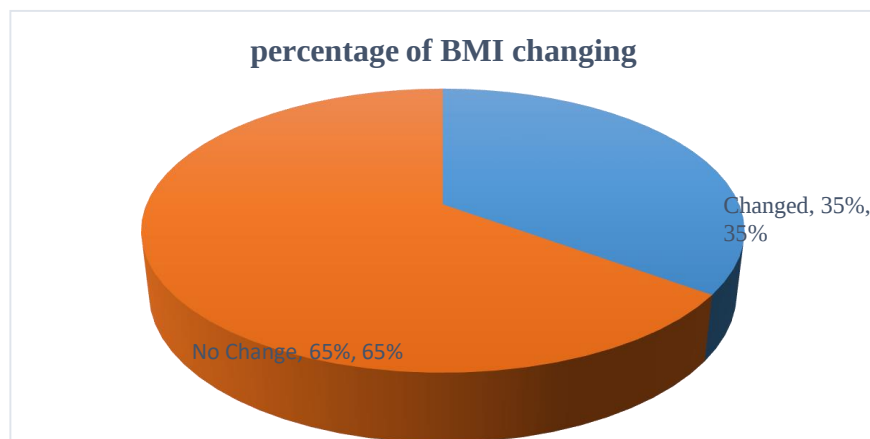


Figure 6: Percentage of BMI Changing (Source: authors, 2023)

Percentage of BMI Changing

Figure 6 is showing the percentage of BMI changing. It is shown that about 65% women had no change in their BMI before and during lockdown. On the other hand, 35% women had change in their BMI as some of them had increase and some had decrease in their BMI.

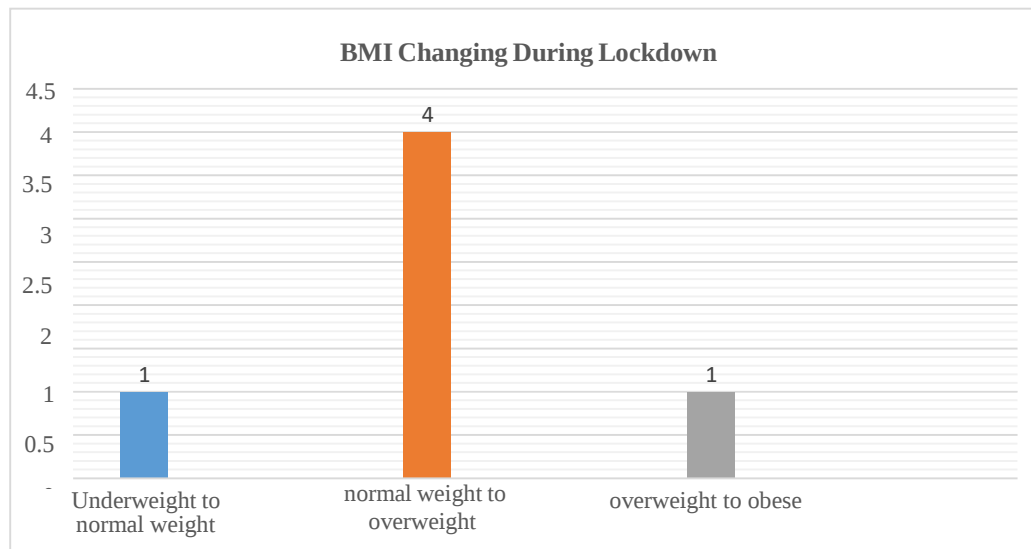


Figure 7: BMI Changing During Lockdown (Source: authors, 2023)

BMI Changing During Lockdown

Figure 7 is showing the BMI changing during lockdown. It is shown that 1 woman's BMI had changed from underweight to normal weight. 4 women's BMI had changed from normal weight to overweight and 1 woman's BMI had changed from overweight to obese.

6.2 Change in Eating Habit

The participants provided information about their eating patterns and weight both during and before the lockdowns using a multiple-choice format. The findings revealed a marked rise in the consumption of unhealthy items like confectionery and chocolate. Additionally, a major weight gain was noticed. The eating of unhealthy snacks was strongly connected with this weight gain.

The participants generally stated that they ate more when confined. About half of them increased their intake of comfort foods like dairy products, chocolate, and sweets as well as salty snacks, which contributed to their weight gain. It's noted that about 21% of the participants said they had increased their intake of organic vegetables and fresh fruits. During quarantine, they consumed several meals and snacks, which contributed to their

increasing weight. Additionally, connections between BMI and the frequency of consuming particular food items (such as fast food, meat, legumes, dairy, and coffee) during quarantine were found to be favorable. In comparison to other weight categories, obese people consumed fast food the most frequently and fruits, vegetables, and legumes the least frequently.

Additionally, study indicate that consumers spent more time cooking their own food at home and that the consumption of home-based recipes and home-processed goods appears to be rising.

Meals Number during Lockdown Period

Participants talked about their meals number during the Covid 19 lockdown.

(Showing figure-8) 55% women consumed 3 meals a day, whereas 15% women consumed more than 3 meals a day and 30% women skipped one of the main meals during the lockdown period. Additionally, 70% women had snacking between meals and 40% women had small afternoon meals which is a significant cause for gaining weight.

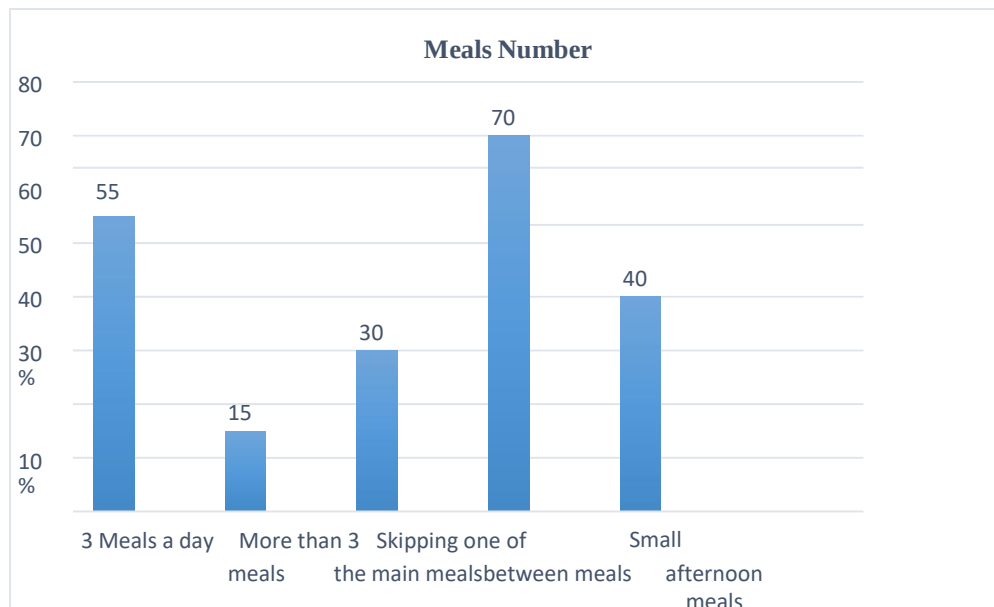


Figure 8: Meals Number during Lockdown (Source: authors, 2023)

Habits Related with Food

Participants explained about different habit related with food. The habits related with foods set as parameters were:

- i. intake of immunity boosting food
- ii. Participation in cooking new/traditional recipes
- iii. Consumption of unhealthy foods when bored or stressed

iv. Intake of sweets, chocolates, and sugar- sweetened beverages

Among 20 participants, (showing figure-9) 75% women took immunity boosting foods like lemon, turmeric, garlic, citrus foods etc. About 85% women participated in cooking new/traditional recipes. About 20% women consumed unhealthy foods when they were bored or stressed during the Covid 19 lockdown. Besides, around 10% women consumed sweets, chocolates, and sugar-sweetened beverages during the Covid 19 lockdown.

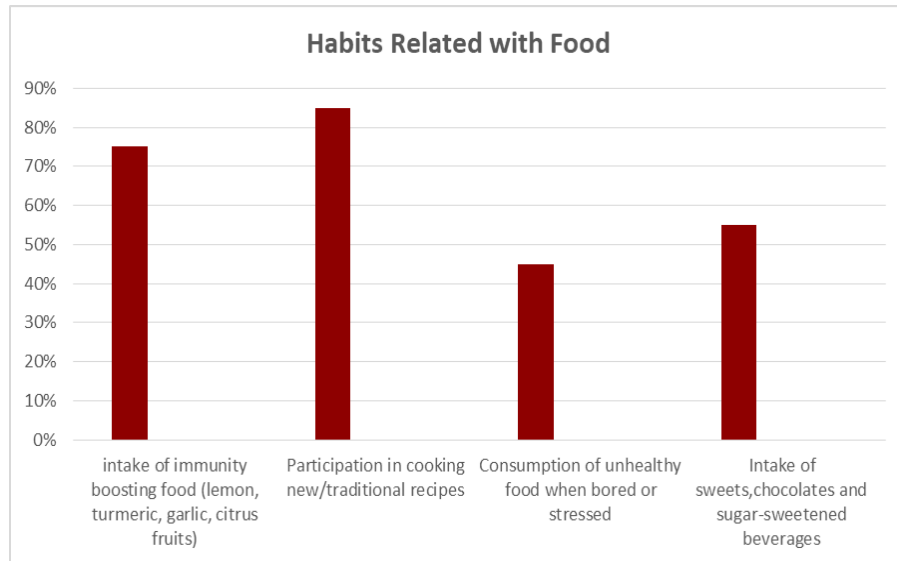


Figure 9: Habits Related with Food (Source: authors, 2023)

6.3 Impact on Lifestyle Changes of Women's Health

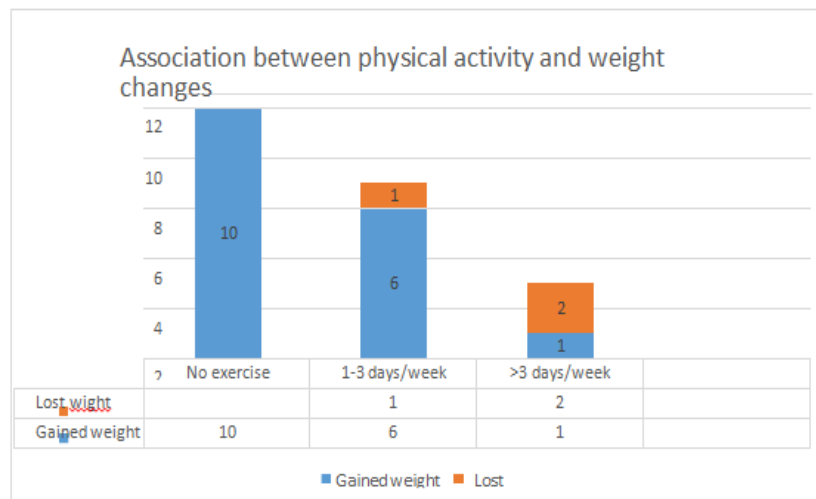


Figure 10: Association between physical activity and weight changes (Source: authors, 2023)

Association between physical activity and weight changes

Figure 10 is showing the association between physical activity and weight changes. It is shown that about 50% participants (10 women) were involved in physical exercise. The rest 50% participants did not participate in any physical exercise. Those who didn't do any physical exercise almost everyone gained weight. Those who did physical exercise 1 to 3 days per week, among them gained weight 6 persons and gained weight 1 person. Besides, who did physical exercise more than 3 days per week, lost weight 2 person and gained weight 1 person.

Engaged in physical exercise

Types of physical exercises participants were involved with:

- i. Walking
- ii. Aerobic Exercise
- iii. High intensity workout with available equipment or substitutes at home
- iv. Yoga

Involvement in household chore

80% participants agreed that their time of involvement in household chores have increased during the lockdown. And the reason of increased load was due to sudden staying in home confinement rather than ever before. 20% of the participants told that the household workload was as before during the lockdown.

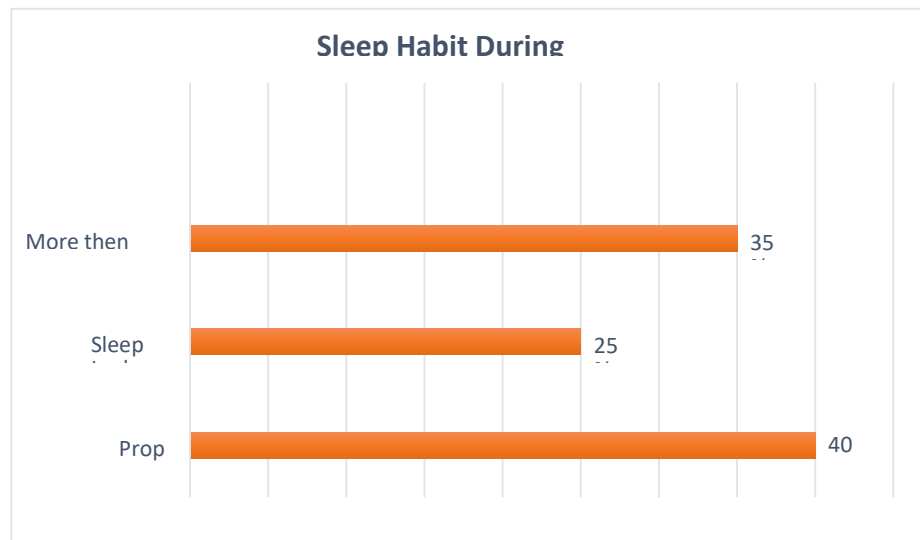


Figure 11: Sleep Habit during Lockdown (Source: authors, 2023)

Sleep Habit during lockdown

Figure 11 showing the sleep habit during lockdown. The sleep habit of the participants had also impacted during the Covid19 lockdown. The sleep habit had been divided into 3 sections. They are: 1. more than enough, 2. Sleep lack, and 3. Proper sleep. As shown in figure, we can see that among the participants, about 35% participants had more than enough sleep, 25% participants had sleep lack and 40% participants had proper sleep.

6.4 Mental Health Deterioration

Covid 19 home confinement had impacted on the mental health on the participants. About 65% participants agreed that their mental health had deteriorated, 15% participants was unsure about that and 20% participants disagreed on that point. Mental health deterioration percentage was high among the lower income and BMI with high value participants.

7. Discussion

The current study intends to investigate the associations between various social demographic, mental, and behavioral activities and BMI changes. It also aims to examine the changes in BMI of Bangladeshi married "before" and "during" the COVID-19 lockdown. The research also sought to determine whether there was a relationship between various sociodemographic traits and eating patterns and physical exercise during the COVID-19 confinement. (Romero-Blanco et. al., 2020) The current study found that before the COVID-19 lockout, the prevalence of underweight, normal weight, overweight, and obesity was 5%, 45%, 35%, and 15%, respectively. Following the protracted COVID-19 rigorous lockdown, these prevalence rates decreased to 0%, 60%, and 15%, respectively. A clear sense of food patterns, the prevalence of inactivity, and a number of other significantly impacting factors were also demonstrated by the current data. However, due to a paucity of data or studies on Bangladeshi married women in comparable situations, making comparisons of these observations may be challenging in the current context.

In this study, it is found that among 20 females, 85% of the females (17 females) gained weight and 15% of the females (3 females) lost weight during the lockdown. Women between the ages of 20 and 60 were the subject of our survey. About 85% of women put on weight, however the remaining 15% of them were over 40 years old and lost weight. Women who gained weight, their body weight increased from at least 2.70% to maximum 7.27%. However, the body weight of women who lost weight declined by 3.64% to 6.58%.

According to their prior BMI, among the 20 participants, 5% of women (1 female) were underweight, 45% of women (9 females) were normal weight, 35% of women (7 females) were overweight, and 15% of women (3 females) were obese. Six women's BMIs, or 30% of the group of 20 women, had changed. However, the remaining 70% of the women put on weight while maintaining the same BMI. During the Covid 19 shutdown, there were 30% of women whose BMI had altered, of them 66% (4 females) gained weight from normal weight, 1 woman became obese from overweight, and 1

woman gained weight from underweight. Therefore, it is clear that among the 20 subjects, the majority of them experienced significant weight gain, but there was little change in BMI between "before" and "during" the Covid 19 lockdown.

The data showed a surge in candy and chocolate consumption. Weight gain was also observed. Unhealthy snacks caused this weight increase. Confined participants ate more. Half of them ate more comfort foods including dairy, chocolate, and sweets, which led to weight gain. 21% of interviewees reported they ate more organic produce. During quarantine, they ate many meals and snacks, gaining weight. During quarantine, BMI was linked to the frequency of eating fast food, meat, legumes, dairy, and caffeine. Obese people ate fast food more than fruits, vegetables, and legumes. Studies show that customers are spending more time cooking at home and consuming more homemade recipes and commodities.

The study showed that the percentage of people that exercised was around 50%. The remaining 50% of participants did not participate in physical activity. All but a small minority of those who did no exercise gained weight. Six people and one person who exercised 1 to 3 days a week gained weight among those who did so. Additionally, among those who exercised more than three days per week, two people lost weight and one person gained weight.

The individuals' sleeping patterns were affected by the Covid 19 shutdown as well. The sleeping pattern has been divided into three parts. They are: (1) more than enough, (2) insufficient sleep, and (3) adequate sleep. Figure 1 illustrates that 35% of participants had more than enough sleep, 25% had insufficient sleep, and 40% had adequate sleep.

Covid 19 home confinement had impacted on the mental health on the participants. About 65% participants agreed that their mental health had deteriorated, 15% participants was unsure about that and 20% participants disagreed on that point. Mental health deterioration percentage was high among the lower income and BMI with high value participants.

8. Recommendations and Conclusions

Some prospective studies may be performed to compare the COVID-19 lockdown's great impact on women's BMI to that of other age groups. Additionally, there are numerous opportunities for the current research to develop and examine new relationships between all advised weight- management practices and health issues, such as female obesity. The results of the recent research can be investigated in the long run to determine the influence on women because the ongoing epidemic may occasionally impose lockdown measures in addition to them (Hossain et. al., 2022). To generate more replicable study findings, the investigation can potentially be enlarged by including more participants with a variety of demographic characteristics. Notably, present research for policy reinforcements must be emphasized and strengthened to actively analyze the obesity influencing elements that may have a strong association with regular physical activity and eating patterns within all of the vulnerable groups, notably women and students.

According to the findings of this investigation, the COVID-19 lockdown has had a significant effect on the body weight, BMI, and various other health-related activities of Bangladeshi women. According to the findings of the study, the participants' body weight changed noticeably over the course of the experiment, although the participants' body mass index (BMI) did not alter noticeably. In addition, being confined to the house had a significant impact on eating patterns, which in turn had an association with both body weight and BMI. In addition to this, it caused women's lifestyles to shift, which in turn had an effect on their health.

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