

# Correlation of Fasting Habits to Testosterone Hormone Levels in UNIDA Gontor Students

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**Abstract.** UNIDA Gontor is a university that has a pesantren system. Students are accustomed to carrying out activities to improve their faith, for example fasting. Fasting is mandatory and sunnah. In Hadith of Bukhari Muslim, it is mentioned that fasting can be used to control libido in men who are not ready to get married, whereas one's libido is controlled by the testosterone hormone. This research purposed to determine the correlation between fasting habits and testosterone hormone levels in UNIDA Gontor students. This study utilized 5 treatments ( $n=2$ ), which were not fasting (control); yaumul bidh fasting (fasting on 13, 14, and 15 Hijri); Monday-Thursday fasting; Dawood fasting; and fasting every day for 37 days. The subjects of this study were male students. Testosterone levels were measured using the ELISA method. Data were analyzed with a one-way ANOVA. The results showed that the average level of testosterone in the fasting group was statistically significantly different ( $P = 0.037$ ). Whereas the Post hoc test used presented that the levels of the testosterone hormone in the Monday-Thursday fasting group were significantly different from other treatments. The fasting habit influences the control of testosterone levels so that it can be applied to control libido as Hadith.

**Keywords:** Fasting habits, Testosterone hormone, UNIDA Gontor students

## 1. Introduction

Darussalam Gontor University (UNIDA Gontor) is a university with a pesantren system where the implementation of the Tridarma is based on the teachings of Islam. Therefore, all academicians in it, including students, are accustomed to carrying out activities to increase faith, for example fasting.

Fasting is mandatory and sunnah. Ramadan fasting is fasting during the month of Ramadan and is one example of fasting that is mandatory (QS Al-Baqoroh 183-185). Whereas fasting that is sunnah, *viz.* Monday-Thursday fasting (HR. An-Nasai no. 2362), yaumul bidh fasting (HR. Abu Daud no. 2449), and Dawood fasting (HR. Bukhari no. 1131).

In addition to being rewarded, fasting is one of the religious rituals that has health benefits for the body. One of them, as in H.R Bukhari Muslim, stated that fasting could be used to control

libido in men who are not ready to get married while libido is controlled by the presence of the hormone testosterone (Muryanti et al., 2006).

According to Batrinos (2012), men who have aggressiveness and high crime rates. He also has high levels of the hormone testosterone. Furthermore, it can be concluded that there is a close relationship between the levels of the hormone testosterone with the level of crime committed by someone. Therefore, if testosterone levels can be controlled, juvenile delinquency levels and crime at the adult level, especially those related to sexual crimes can be reduced.

Several studies on fasting have been carried out. The previous research was done by Marfu'ah (2018a) which showed that yaumul bidh fasting, Monday-Thursday fasting, Dawood fasting and fasting every day were able to increase the total number of spermatozoa and the morphology of normal spermatozoa in Balb / C strain mice. Marfu'ah's research (2018b) explained that Monday-Thursday fasting could reduce cholesterol levels in Balb / C strain mice. Rosyidin's research (2011) and Chusna (2017) stated that Monday-Thursday fasting affected mental health. According to Masitoh's research (2014), Monday-Thursday fasting could be used to increase spiritual intelligence.

Research on the effect of fasting on testosterone hormone levels has been conducted by Marfu'ah and co-worker (2019) using subjects Balb/C strain mice. Based on the results of their research, fasting can increase testosterone levels but not exceed the normal levels. In contrast, the most optimal type of fasting to control testosterone hormone levels is Monday-Thursday fasting. This research is a continuation of the research by taking subjects in humans.

## **2. Method**

The method of research was begun with finding subjects to be used in research. After obtaining volunteer subjects, a letter of willingness was made to be the subject of research and a letter of ethnical clearance. The subjects were then asked to fast from dawn (around 04:30 AM, GMT+7) to sunset (around 06:00 PM, GMT+7) for 37 days.

Blood of volunteers was drawn before and after treatment. This process began with the subject being asked to sit on a chair with a straight arm position. Subjects were asked to clench their fists and placed a  $\pm 10$  cm tourniquet above the elbow folds. The chosen vein was the median cubital vein. The skin on the part that would be drawn off was cleaned using a cotton swab with 70% alcohol then waited till dry.

The vein that has been cleaned with 70% alcohol was pricked with a syringe needle, with a tilt angle between the needle and the skin around 15 degrees. The syringe pump was pulled so that the blood entered the syringe tube. After  $\pm 3$  mL of blood had been taken, the needle was withdrawn and put on a puncture mark 70% alcohol cotton and pressed for  $\pm 2$  minutes then put on a plaster. The tourniquet was removed, and subjects were asked to release their fists.

The collected blood was placed into an Eppendorf bottle and centrifuged using a speed of 3,000 rpm for 20 minutes to obtain the plasma. The collected plasma was stored in a freezer at  $-20^{\circ}\text{C}$ . Measurement of testosterone levels in blood plasma was done using the ELISA method. The data obtained were analyzed using the ANOVA with the significance level of

5%. If the results are significant, then the analysis continues with the Post Hoc test in the form of LSD. Analyzes were performed using the SPSS 16.0 statistical program.

### 3. Results

The results of the study in the form of average testosterone levels before and after treatment was presented in Table 1. Levels of testosterone in the control group, treatment groups of D and E, increased between before treatment and after treatment. While the levels of the hormone testosterone in the treatment groups B and C decreased between before and after treatment.

The results of the average analysis of testosterone levels in subjects after being treated with fasting with one-way ANOVA showed that the significance value was 0.037. This proved that the average testosterone levels in the control group compared with the treatment group were statistically significantly different ( $P < 0.05$ ). Hormone levels in all treatment groups were lower than in the control group. The lowest testosterone levels occurred in the treatment group C, followed by treatment groups B, D and E. While based on the Post hoc test using the LSD method showed that a significance value of  $P < 0.05$  was found in the treatment groups C with B, C with D and C with E showed that testosterone levels in the treatment group C were significantly different from the treatment groups B, D and E.

**Table 1: Average testosterone hormone levels**

<b>Treatment</b>	<b>n</b>	<b>Testosterone hormone levels before treatment (ng/ml)</b>	<b>Testosterone hormone levels after treatment (ng/ml)</b>
A	2	7.58	$8.75 \pm 0,05^a$
B	2	8.76	$8.00 \pm 0,06^b$
C	2	7.36	$6.30 \pm 0,01^{bc}$
D	2	6.88	$8.55 \pm 0,01^b$
E	2	8.52	$8.65 \pm 0,11^b$

Information: a, b,c = significant different at the level of 5%

n = number of experimental volunteer

SD = standar deviasi

A = not fasting (control)

B = yaumul bidh fasting

C = Monday-Thursday fasting

D = Dawood fasting

E = fasting every day for 37 days

### 4. Discussion

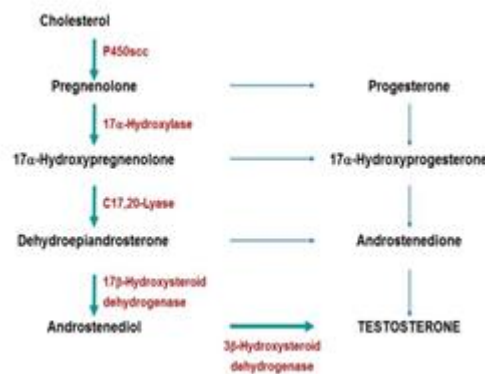
According to the previous study of Marfu'ah (2019), the result showed the effect of fasting on testosterone levels carried out on experimental animals such as Balb/C strain mice were insignificant results. Meanwhile, the research subjects were changed into humans, as in this

study, the results obtained were significant. Testosterone levels in mice Balb / C increased compared with the control group. This result presented that testosterone is strongly influenced by food intake. Based on observations of subjects in the treatment group, it has an increase in appetite, thereby increasing testosterone levels. Although, the rise in testosterone levels that occur does not exceed normal levels. Whereas in this study, the levels of testosterone in the treatment group decreased when compared to the control group even though all levels of the hormone testosterone in the treatment group were normal levels of 2.5 - 9.5 ng/ml (Pathology handbook, 2019).

The results of this study indicated that fasting are activities that can be carried out by animals and humans, but the effect of these activities on metabolism in the body is closely related to the intellect and intentions of the living things that carry it out. Humans as intelligent beings and can do fasting with the aim to show significant results than animals that are not intelligent and cannot do the intention before being fasted. As said, Prophet Rasulallah in H.R Bukhari Muslim, who said that "All charity/deed depends on his intentions." Therefore, if you want to do all activities, humans should start with good intentions then the results are also in the form of goodness.

Based on the fasting applied, the most optimal fasting to reduce testosterone levels was fasting Monday-Thursday. Monday-Thursday fasting is one of the fasts that is highly favored by Prophet Rasulallah (H.R Tirmidzi, Nasai and Ahmad). This fast is sunnah and is applied on Monday and Thursday. The time lag between Monday and Thursday fasting is between 2-3 days. The possibility of this time lag is the most optimal in controlling the process of cholesterol metabolism into the hormone testosterone.

The metabolism of cholesterol into testosterone occurs in the mitochondria of testicular cells. Cholesterol is transferred into the mitochondria using the help of the StAR protein. Cholesterol is converted into the hormone testosterone using the enzyme 3 $\beta$ -hydroxysteroid dehydrogenase, 17 $\alpha$ -hydroxylase / C17-20-lyase, and 17 $\beta$ -hydroxysteroid dehydrogenase. The testosterone biosynthesis process was shown in Figure 1 (McEwan and Brinkmann, 2016).



**Figure 1: Biosynthesis of testosterone hormone.**

## **5. Conclusion**

The results showed that the fasting habits practiced by UNIDA Gontor students affected controlling the level of the hormone testosterone. Furthermore, it could be used to control libido in the words of Prophet Rasulullah in H.R Bukhari Muslim. In contrast, the most optimal type of fasting to monitor testosterone levels is Monday and Thursday fasting.

## **6. Suggestion**

Further research needs to add some parameters, such as the number of research subjects, increasing the length of time of treatment, the change in male subjects who experience testosterone deficiency or excess hormones.

## **7. Acknowledgement**

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