Research Article

Differences in the Effectiveness of Giving Dark Chocolate and Ginger to Reducing Menstrual Pain Intensity in SMAN 1 Cikande Students in 2022

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Abstract

Aims: Menstrual pain (dysmenorrhea) is pain during menstruation that is usually experienced by young women with complaints of aches or cramps in the lower abdomen and pelvis. Menstrual pain (dysmenorrhea) often begins after the first menstruation. Pain decreases after menstruation, but pain can continue to be experienced during menstrual periods in some women so that it has an impact on daily activities, such as school activities and work.

Objective: This study aims to analyze differences in the effectiveness of giving dark chocolate and ginger to reduce the intensity of menstrual pain in female students at SMAN 1 Cikande.

Methods: In this study, the researcher used a Quasi Experimental Pre-Posttest with Control Group design. The population in this study were all female students who experienced menstrual pain during menstruation. 28 female students with a sampling technique using the Non-Probability Sampling technique or Non-Random Sampling with the Purposive Sampling method.

Result: The results of the study were differences in the intensity of menstrual pain reduction with the non-parametric test, namely Wilcoxon in 14 respondents who were given dark chocolate with a p-value of $0.001 < (0.05)$ while 14 other respondents who were given ginger a p-value of $0.001 < (0\ 0.05$ Differences in the effectiveness of dark chocolate and ginger based on the Mann Whitney test p-value $0.299 > (0.05)$.

Conclusions and Suggestions: There was no significant difference in the effectiveness of reducing pain intensity in students of SMAN 1 Cikande Serang Regency between those given dark chocolate and ginger for 3 days of treatment. It is hoped that non-pharmacological interventions can be applied to treat menstrual pain.

Keywords
Menstrual Pain, Dark Chocolate, Ginger

INTRODUCTION

One of the hallmarks of female puberty is menstruation. Menstruation is the periodic discharge of blood and body cells from the vagina from the uterine wall of women (1). However, menstruation experienced by adolescent women can cause problems, one of which is dysmenorrhea or menstrual pain.

Menstrual pain (Dysmenorrhea) is a complaint of pain during menstruation and pain is usually felt pressing down, aches or cramps in the lower abdomen and pelvis. Menstrual pain (Dysmenorrhea) is a problem commonly experienced by young women. According to the World Health Organization (2).

The prevalence of dysmenorrhea ranged from 1.7% to 97% in 106 studies with 125,249 female respondents. The reported prevalence in the UK ranges from 45% to 97%. Research conducted in 2012 in Cairo stated that 93% of women experienced dysmenorrhea. A cross-sectional study of 256 female university students conducted in Asia in 2011 at the University of Hong Kong reported that the prevalence of dysmenorrhea was around 80%. Research conducted in 2011 in India stated that there were 51% of women experiencing dysmenorrhea, even among them there were 22.1% of respondents experiencing limitations in carrying out daily activities. Indonesia is estimated at 55% and around 45-95% among women of reproductive age. Based on Indonesia's health profile data in 2013 the incidence of dysmenorrhea consisted of 54% primary dysmenorrhea and 9.36% secondary dysmenorrhea (3).

Dysmenorrhea has a negative impact on quality of life, mental status and social roles. Someone who is experiencing dysmenorrhea becomes depressed and moody so that it can interfere with social interactions. Some adolescents and women with dysmenorrhea experience a loss of appetite and take time off from school or work.

Several ways to help reduce pain can be done using pharmacological and non-pharmacological methods. One of the non-pharmacological therapies in terms of nutrition that can be used as an alternative to overcome pain during menstruation is dark chocolate. Dark chocolate or dark chocolate is rich in calcium, potassium, sodium, magnesium and vitamins A, B1, C, D, and E. Magnesium is useful for relaxing muscles and can provide a sense of relaxation that can control a moody mood (4). Another non-pharmacological therapy that can be used to reduce dysmenorrhea is by using traditional medicines derived from plant materials, one of which is ginger which is believed to reduce pain.

METHODS

This study employs a quantitative methodology and a "Quasi Experimental Pre-Post test with Control Group" design to examine the effects of dark chocolate and ginger on human subjects. There is no control group in quasi-experimental studies (5). Because of this, it will be easier to gauge the efficacy of a given treatment. The research results will be unbiased thanks to a pre- and post-test for each treatment with dark chocolate and ginger. Primary data were gathered through interviews and participant observation for this study.

RESULTS

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1. **Menstrual Pain Intensity Before and After Giving Dark Chocolate to Students at SMAN 1 Cikande, Serang Regency**

Table 1.
Distribution of frequency based on the intensity of menstrual pain before and after being given dark chocolate to female students at SMAN 1 Cikande, Serang Regency

Category	Pre Day 1		Post Day 1		Pre Day 2		Post Day 2		Pre Day 3		Post Day 3	
	n	%	n	%	n	%	N	%	N	%	n	%
No Pain	0	0	0	0	0	0	0	0	0	0	12	85.7
Mild Pain	0	0	10	71.4	5	35.7	14	100	14	100	2	14.3
Moderate Pain	14	100	4	28.6	9	64.3	0	0	0	0	0	0
Total	4	100	14	100	14	100	14	100	14	100	14	100

Based on table 1, it can be seen the intensity of the decrease in menstrual pain on the first day of giving dark chocolate from 14 female respondents at SMAN 1 Cikande Serang Regency before being given dark chocolate, all respondents experienced moderate pain, namely 14 people (100%) and the intensity of pain after being given dark chocolate was partially decreased to mild pain as many as 10 people (71.4%). The second day of giving dark chocolate from 14 female respondents at SMAN 1 Cikande, Serang Regency before being given dark chocolate, most of them experienced moderate pain as many as 9 people (64.3%) and the intensity of pain after being given dark chocolate all respondents decreased to mild pain as many as 14 people (100%). The third day of giving dark chocolate from 14 female respondents at SMAN 1 Cikande, Serang Regency before being given dark chocolate, all respondents experienced mild pain, namely 14 people (100%) and the intensity of pain after being given dark chocolate mostly decreased to no pain, as many as 12 people (85.7%).

2. **Intensity of Menstrual Pain Before and After Giving Ginger to Students at SMAN 1 Cikande, Serang Regency**

Table 2.
Frequency distribution based on the intensity of menstrual pain before and after being given ginger to female students at SMAN 1 Cikande, Serang Regency

Category	Pre Day 1		Post Day 1		Pre Day 2		Post Day 2		Pre Day 3		Post Day 3	
	n	%	n	%	n	%	n	%	N	%	n	%
No Pain	0	0	0	0	0	0	3	21.4	0	0	2	14.3
Mild Pain	0	0	4	28.6	10	71.4	11	78.6	14	100	12	85.7
Moderate Pain	14	100	10	71.4	4	28.6	0	0	0	0	0	0
Total	14	100	14	100	14	100	14	100	14	100	14	100

Based on table 2 it can be seen the intensity of the decrease in menstrual pain on the first day of giving ginger from 14 female respondents at SMAN 1 Cikande Serang Regency before being given ginger all respondents experienced moderate pain as many as 14 people (100%) and the intensity of pain after being given ginger mostly experienced pain. moderate as many as 10 people (71.4%). The second day of giving ginger from 14 female respondents at SMAN 1 Cikande, Serang Regency, before being given ginger, most of them experienced mild pain, namely 10 people (71.4%) and the intensity of pain after being given ginger partially became mild pain, namely 11 people (78.6 %). The third day of giving ginger from 14 female respondents at SMAN 1 Cikande Serang Regency before being given ginger all respondents experienced mild pain, namely 14 people (100%) and the intensity of pain after being given ginger mostly became mild pain as many as 12 people (85.7%).

Bivariate Analysis

1. **Differences in Menstrual Pain Intensity Before and After Giving Dark Chocolate to Students at SMAN 1 Cikande, Serang Regency**

Table 3.
Differences in pain intensity on the first day before and after being given dark chocolate to students of SMAN 1 Cikande, Serang Regency

Variable	n	*Mean Rank*	*Z*	*p-value*
Pre DC Pain-Post DC Pain Day 1	14	7.50	-3.397	0,001
Pre DC Pain-Post DC Pain Day 2	14	7.50	-3.494	0,000
Pre DC Pain-Post DC Pain Day 3	14	7.50	-3.442	0,001

Based on table 3, it can be seen that on the first day before and after being given dark chocolate, the mean rank of the respondent's menstrual pain scale was 7.50. Based on the non-parametric test, namely Wilcoxon, a p-value of $0.001 < (0.05)$. This shows that there is a significant difference in the intensity of menstrual pain on the first day before and after being given dark chocolate to students of SMAN 1 Cikande, Serang Regency.

The second day before and after being given dark chocolate, the mean rank of the respondent's menstrual pain scale was 7.50. Based on the non-parametric test, namely Wilcoxon, the p-value is $0.000 < (0.05)$. This shows that there is a significant difference in the intensity of menstrual pain on the second day before and after being given dark chocolate to students at SMAN 1 Cikande, Serang Regency.

The third day before and after being given dark chocolate, the mean rank of the respondent's menstrual pain scale was 7.50. Based on the non-parametric test, namely Wilcoxon, a p-value of $0.001 < (0.05)$. This shows that there is a significant difference in the intensity of menstrual pain on the third day before and after being given dark chocolate to students at SMAN 1 Cikande, Serang Regency. So it can be concluded that dark chocolate is effective in reducing menstrual pain in students of SMAN 1 Cikande, Serang Regency.

2. **Differences in Menstrual Pain Intensity Before and After Giving Ginger to Students at SMAN 1 Cikande, Serang Regency**

Table 4.
Differences in pain intensity before and after giving ginger to students of SMAN 1 Cikande, Serang Regency

Variable	n	Mean Rank	Z	p-value
Pre KA Pain-Post KA Pain Day 1	14	6.50	-3.464	0,001
Pre KA Pain-Post KA Pain Day 2	14	7.50	-3.442	0,001
Pre KA Pain-Post KA Pain Day 3	14	6.00	-3.317	0.001

Based on table 4, it can be seen that the intensity of menstrual pain on the first day before and after being given ginger, the mean rank of the respondent's menstrual pain scale was 6.50. Based on the non-parametric test, namely Wilcoxon, a p-value of 0.001 < (0.05). This shows that there is a significant difference in the intensity of menstrual pain on the first day before and after being given ginger to students at SMAN 1 Cikande, Serang Regency.

The intensity of menstrual pain on the second day before and after being given ginger, the mean rank of the respondent's menstrual pain scale was 7.50. Based on the non-parametric test, namely Wilcoxon, a p-value of 0.001 < (0.05). This shows that there is a significant difference in the intensity of menstrual pain on the second day before and after being given ginger to students at SMAN 1 Cikande, Serang Regency.

The intensity of menstrual pain on the third day before and after being given ginger, the mean rank of the respondent's menstrual pain scale was 6.00. Based on the non-parametric test, namely Wilcoxon, a p-value of 0.001 < (0.05). This shows that there is a significant difference in the intensity of menstrual pain on the third day before and after being given ginger to students at SMAN 1 Cikande, Serang Regency. So it can be concluded that ginger is effective in reducing menstrual pain in students of SMAN 1 Cikande, Serang Regency.

3. **Differences in the Effectiveness of Dark Chocolate and Ginger on Reducing Menstrual Pain Intensity in Students at SMAN 1 Cikande, Serang Regency**

Table 5.
Differences in the effectiveness of dark chocolate and ginger on decreasing the intensity of menstrual pain in female students of SMAN 1 Cikande Serang Regency

Variable	Group	N	Mean Rank	Z	p-value
Menstrual Pain Intensity Day 1	Dark Chocolate	14	8.50	-1.275	0,202
	Jahe	14	6.75		
Menstrual Pain Intensity Day 2	Dark Chocolate	14	6.33	-687	0,492
	Jahe	14	7.82		
Menstrual Pain Intensity Day 3	Dark Chocolate	14	8.50	-1.039	0,299

Based on table 5, it can be seen that on the first 14 respondents who were given dark chocolate, the mean post-test rank was 8.50, while the other 14 respondents who were given ginger had a mean post-test rank of 6.75. Based on the Mann Whitney test, the p-value was 0.202. Because the p-value is 0.202 > (0.05), it can be concluded that there is no significant difference in decreasing the intensity of menstrual pain in female students of SMAN 1 Cikande Serang Regency on the first day between those given dark chocolate and ginger.

The second day of the 14 respondents who were given dark chocolate, the mean post-test rank was 6.33, while the other 14 respondents who were given ginger had a mean post-test rank of 7.82. Based on the Mann Whitney test, a p-value of 0.492 was obtained. Because the p-value is 0.492 > (0.05), it can be concluded that there is no significant difference in the decrease in the intensity of menstrual pain in female students of SM SMAN 1 Cikande Serang Regency on the second day between those given dark chocolate and ginger.

On the third day of the 14 respondents who were given dark chocolate, the mean post-test rank was 8.50, while the other 14 respondents who were given ginger had a mean post-test rank of 6.55. Based on the Mann Whitney test, the p-value was 0.299. Because the p-value is 0.299 > (0.05), it can be concluded that there is no significant difference in the effectiveness of reducing the intensity of menstrual pain in students of SMAN 1 Cikande Serang Regency on the third day between those given dark chocolate and ginger.

DISCUSSION

Univariate Analysis

1. **Description of Menstrual Pain Intensity Before Giving Dark Chocolate and Before Giving Ginger to Students at SMAN 1 Cikande, Serang Regency**

Pain is a condition that is more than a single sensation caused by a particular stimulus. Pain is subjective and individual. Pain stimuli can be physical and/or mental stimuli, while damage can occur in the actual tissue or in the ego function of an individual (Potter and Perry, 2010).

Menstrual pain usually begins 24 hours before your period comes and lasts up to the first 12 hours of your period. The degree of pain varies, including mild (lasts a while and can still carry on with daily activities), moderate (because the pain requires medication to relieve pain, but can still continue his work). If the pain is mild, you can still move, it means it's still normal. But if the pain that occurs to interfere with activities, then it is included in the disorder. Pain can be felt in the lower abdomen, waist and even back.

In the results of research that has been carried out, menstrual pain felt by students of SMAN 1 Cikande Serang Regency is the highest on a moderate pain scale. This happened because before being given dark chocolate and ginger, menstrual pain went naturally and normally. Menstrual pain is felt because during the menstrual phase, prostaglandins cause contractions, besides that it has a function to make the uterine wall contract and the surrounding blood vessels to be squeezed (constriction) which causes tissue ischemia. In addition, prostaglandins also stimulate pain nerves in the uterus, thereby increasing the intensity of pain. Prostaglandins increase the stimulating hormone oxytocin. And the hormone oxytocin also has the property of increasing uterine contractions (6).

2. **Description of Menstrual Pain Intensity After Giving Dark Chocolate and After Giving Ginger to Students at SMAN 1 Cikande, Serang Regency**

Pain is a condition that is more than a single sensation caused by a particular stimulus. Pain is subjective and individual. Pain stimuli can be physical and/or mental stimuli, while damage can occur in the

actual tissue or in the ego function of an individual (7).

The menstrual cycle is the menstrual cycle experienced by women every month, starting from the first day of menstruation or menstruation, until the first day of menstruation in the following month. The menstrual cycle is said to be normal, approximately 24-35 days, not less than 24 days and not exceeding 35 days (Sarwono, 2010).

Giving dark chocolate and ginger are some of the interventions of the many relaxation techniques interventions during menstruation to reduce the intensity of menstrual pain. This relaxation technique can reduce pressure and symptoms in women who have menstrual problems by consuming foods that stimulate the release of endorphins and serotonin (6).

In the results of research that has been carried out, menstrual pain felt by students of SMAN 1 Cikande Serang Regency is the highest on a painless scale after being given dark chocolate and mild pain after being given ginger on the third day. This happens because before being given dark chocolate menstrual pain goes naturally and normally. Menstrual pain is felt because during the menstrual phase, prostaglandins cause contractions, besides that it has a function to make the uterine wall contract and the surrounding blood vessels to be squeezed (constriction) which causes tissue ischemia. In addition, prostaglandins also stimulate pain nerves in the uterus, thereby increasing the intensity of pain. Prostaglandins increase which stimulates the hormone oxytocin and the hormone oxytocin also has the property of increasing uterine contractions.

While the menstrual pain that is felt is the highest on the mild pain scale after being given ginger on the third day the menstrual pain is felt because in the menstrual phase prostaglandins cause contractions, besides that it has a function to make the uterine wall contract and the surrounding blood vessels are pinched (constriction) which

causes tissue ischemia. . So by giving dark chocolate and ginger can stimulate the release of endorphins and serotonin so that pain signals can be inhibited so that they produce endorphins so that they can reduce menstrual pain.

Bivariate Analysis

1. Differences in Menstrual Pain Intensity Before and After Giving Dark Chocolate to Students of SMAN 1 Cikande Serang Regency

In this study, researchers gave chocolate because chocolate gave a comfortable feeling and changed a person's feelings and mood for the better so that the pain experienced by respondents was reduced. Another thing that is also important in dealing with menstrual pain is self-preparation and is more associated with psychological factors. All pain depends on the relationship of the central nervous system, especially the thalamus and cortex. The degree of suffering experienced due to pain stimulation itself can depend on the educational background of the patient, educational factors and psychological factors are very influential. Pain can be caused or magnified by the psychological state of the sufferer of menstrual pain.

Dark chocolate is the quality of chocolate, one of which is judged by the percentage of high solid chocolate content and low sugar content. The United States government sets a minimum of 35% chocolate paste content for dark chocolate while European standards set a minimum of 43%. High-quality dark chocolate has a very low sugar content compared to other types of chocolate and therefore tastes more bitter (8).

Consuming dark chocolate has serotonin which acts as an anti-depressant, this can cause feelings of pleasure and alertness and can help reduce aches and pains experienced, including pain during menstruation. Consuming dark chocolate (dark chocolate) can also make blood pressure normal. Dark chocolate also

contains caffeine, which is a central nervous stimulant, and theobromine, as well as a smooth muscle stimulant. Smooth muscle includes blood vessels and uterus (9).

2. Differences in the intensity of menstrual pain before and after ginger was given to students at SMAN 1 Cikande, Serang Regency

Red ginger plant or Zingiber Officinale Roxb. var. Rubra is a type of plant that includes herbal plants that have pseudo-green stems with a height of approximately 40-50 cm shaped like a rhizome containing 2-3% essential oils consisting of zingiberin, chemferia, limonene, borneol, cineol, zingiberal, linalool, geraniol, kavikol, zingiberol, gingerol, and shogaol (10,11). The results of Utari's research (12) stated that the ginger concoction given to adolescents who were experiencing menstruation could help reduce menstrual pain. Juliana's research (13) states that sour ginger spice drinks can help reduce menstrual pain in nursing students.

Women who are experiencing dysmenorrhea have prostaglandin levels 10 times higher than those who do not experience dysmenorrhea. Prostaglandins can increase uterine contractions and in excessive levels will activate the large intestine. This dysmenorrhea can occur due to an increase in prostaglandin (PG) F2-alfa which is a cyclooxygenase (COX2) which can cause hypertonus and vasoconstriction in the myometrium, causing ischemia and pain during menstruation (14). Ginger is believed to be able to overcome pain during menstruation as an anti-inflammatory by its way of working, namely by inhibiting the work of enzymes in the COX cycle so that it can inhibit the release of these enzymes to prostaglandins that cause inflammation. In addition, red ginger can also inhibit uterine contractions which can cause pain during menstruation.

3. Differences in the Effectiveness of Dark Chocolate and Ginger on

Menstrual Pain Intensity in Students at SMAN 1 Cikande, Serang Regency

Pain is a condition that is more than a single sensation caused by a particular stimulus. Pain is subjective and individual. Pain stimuli can be physical and/or mental stimuli, while damage can occur in the actual tissue or in the ego function of an individual (15). Menstrual pain usually begins 24 hours before your period comes and lasts up to the first 12 hours of your period. The degree of pain varies, including mild (lasts for a while and can still carry on with daily activities), moderate (because the pain requires medication to relieve pain, but can still continue to work), severe (the pain is so severe that it requires rest and medication to relieve pain). relieve pain). If the pain is mild, you can still move, it means it's still normal. However, if the pain is so severe that it interferes with activities or is unable to carry out activities, it is considered a disorder. Pain can be felt in the lower abdomen, waist and even back.

Pain scores on a numeric rating scale or other similar scale that helps explain the intensity of menstrual pain. Pain that is asked on this scale is before and after the intervention to evaluate the effectiveness of the intervention. If the client understands the use of the scale and can answer it and the images expressed or shown are carefully selected, each of these instruments can be valid and reliable (16).

There are several factors that influence pain according to (15), including age, gender, culture, meaning of pain, attention, anxiety, fatigue, previous experiences, coping styles and family and social support. Age is an important variable that affects pain, especially in adolescents. The developmental differences found between these groups may influence how adolescents react to pain.

The experience of pain and the way a person adapts to pain. It is also closely related to the cultural background of the individual. Individuals will perceive pain in different ways if the pain gives the

impression of a threat, a loss, punishment and challenge. Another factor that significantly influences pain response is the presence of those closest to the client and their attitude towards the client. Individuals from different socio-cultural groups have different expectations about the people to whom they express their complaints about pain. Even if pain is felt, the presence of someone who is meaningful to the client will minimize loneliness and fear. If there is no family, often the experience of pain makes the client more depressed, on the contrary the availability of someone who provides support is very useful because it will make a person feel more comfortable. The presence of parents is very happy for children who are experiencing pain.

Dark chocolate (with cocoa content of more than 70%) is very effective in relieving menstrual pain. Consuming it can make muscles feel more relaxed and reduce pain. Dark chocolate is rich in calcium, potassium, sodium, magnesium and vitamins A, B1, C, D and E. Magnesium is useful for providing a sense of relaxation that can control a gloomy mood. Magnesium regulates protein synthesis, the contraction properties of muscles are caused by the presence of protein. Magnesium functions in helping muscle relaxation, transmitting nerve signals, reducing migraines, as a natural sedative and enlarges blood vessels so that magnesium can relieve dysmenorrhea or menstrual pain (17).

Ginger in Latin is Zingiber officinale is a rhizome plant that is well-known as a spice and medicinal ingredient. Ginger has been famous since ancient times until now. Ginger has a characteristic with a sharp aroma. Ginger is one of the herbal therapies that can be used, easy to obtain, cheap and affordable. Ginger is as effective in reducing pain as the analgesic drugs mefenamic acid and ibuprofen (18).

Both of these techniques are non-pharmacological methods that have non-invasive, simple, inexpensive, simple/easy to use effects, are effective, quickly available and without harmful side effects compared to pharmacological methods. Apart from being without side effects, non-pharmacological treatment also does not cause systemic allergic reactions. serves to reduce menstrual pain without side effects.

CONCLUSION

Based on the results of the analysis and discussion of the research, it is concluded that "Differences in the Effectiveness of Giving Dark Chocolate and Ginger to Reducing Menstrual Pain Intensity in Students at SMAN 1 Cikande, Serang Regency" as follows :

1. All students of SMAN 1 Cikande Serang Regency before being given dark chocolate experienced mild pain, as many as 14 people (100%). Most of the students of SMAN 1 Cikande Serang Regency experienced a decrease in menstrual pain after being given dark chocolate to no pain, as many as 12 people (85.7%).
2. All students of SMAN 1 Cikande Serang Regency before being given ginger experienced mild pain, as many as 14 people (100%). Most of the students of SMAN 1 Cikande Serang Regency experienced a decrease in menstrual pain after being given ginger to mild pain, as many as 12 people (85.7%).
3. Based on the non-parametric test, namely Wilcoxon, the p-value is $0.001 < (0.05)$ on the first day, the p-value is $0.000 < (0.05)$ on the second day, and the p-value is $0.001 < (0.05)$ on the third day. This shows that there is a significant difference in the intensity of menstrual pain before and after being given dark chocolate to students of SMAN 1 Cikande Serang Regency for 3 days given dark chocolate.
4. Based on the non-parametric test, namely Wilcoxon, the p-value is $0.001 < (0.05)$ on the first day, the p-value is $0.001 < (0.05)$ on the second day, and the p-value is $0.001 < (0.05)$ on the third day. This shows that there is a

significant difference in the intensity of menstrual pain before and after being given ginger to students of SMAN 1 Cikande Serang Regency for 3 days of treatment.

5. Based on the Mann Whitney test, obtained p-value 0.202 > (0.05) on the first day, p-value 0.492 > (0.05) on the second day, and p-value 0.299 > (0 0.05) on the third day. It can be concluded that there is no significant difference in the effectiveness of reducing pain intensity in students of SMAN 1 Cikande Serang Regency between those given dark chocolate and ginger for 3 days of treatment.

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