

## Multilevel Analysis on the Contextual Effect of Posyandu on Exclusive Breastfeeding in Sleman, Yogyakarta

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### ABSTRACT

**Background:** There is an increasing evidence that exclusive breastfeeding (EBF) up to six-month of age has important consequences on health and nutritional outcomes of children. However, studies on the contextual effect of integrated health post (posyandu) on EBF are scarce. The purpose of this study was to examine the contextual effect of posyandu on exclusive breastfeeding using multilevel analysis.

**Subjects and Method:** A cross-sectional study was conducted in Sleman, Yogyakarta, from November to December 2018. A sample of 200 lactating mothers was selected by simple random sampling. The dependent variable was exclusive breastfeeding. The independent variables were knowledge, education, age, parity, birth spacing, employment, and family support. The data were collected by a multilevel logistic regression.

**Results:** Exclusive breastfeeding increased with good knowledge ( $b= 2.66$ ; 95% CI= 0.85 to 4.47;  $p= 0.004$ ), high education ( $b= 2.10$ ; 95% CI= 0.29 to 3.91;  $p= 0.023$ ), maternal age 20-35 years ( $b= 3.35$ ; 95% CI= 1.46 to 5.24;  $p<0.001$ ), multiparous ( $b= 2.90$ ; 95% CI= 0.41 to 3.39;  $p= 0.012$ ), birth spacing  $\geq 2$  years ( $b= 2.91$ ; 95% CI= 0.92 to 4.89;  $p= 0.004$ ), unemployed mother ( $b= 4.53$ ; 95% CI= 2.39 to 6.67;  $p<0.001$ ), strong family support ( $b= 2.88$ ; 95% CI= 1.04 to 4.72;  $p= 0.002$ ). Integrated health post had substantial contextual effect on exclusive breastfeeding with ICC= 29.2%.

**Conclusion:** Exclusive breastfeeding increases with high knowledge, high education, maternal age 20-35 years, multiparous, birth spacing, unemployed mother, strong family support. Integrated health post has substantial contextual effect on exclusive breastfeeding.

**Keywords:** exclusive breastfeeding, integrated health post, multilevel analysis

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### BACKGROUND

The United Nation Childrens Fund (UNICEF) and the World Health Organization (WHO) in order to reduce child morbidity and mortality, sets a gold standard for feeding infants and toddlers. The policy includes initiating breastfeeding in the first 1 hour after birth and breastfeeding children or only given breast milk for at least six months (PAS Implementation Guidelines, 2017). Exclusive breast milk based on Government Regulation No. 33 of 2012 is

breast milk given to babies from birth for six months, without adding and or replacing with other foods or drinks (except drugs, vitamins and minerals) (RI health profile, 2016).

Exclusive breastfeeding has benefits and an important role for growth and resistance in children. Children who are given exclusive breastfeeding will grow and develop optimally and not easily get sick. The global study The Lancet Breastfeeding Series, 2016 has proven that exclusive

breastfeeding reduces infection deaths by 88% in infants younger than 3 months. There are 31.36% (82%) of 37.94% of children who are sick, because they do not receive Exclusive breastfeeding. Investment in prevention of LBW, stunting and increasing IMD and Exclusive Breastfeeding contribute to reducing the risk of obesity and chronic diseases (The Lancet, 2016).

Many factors cause mothers not to consider it important and reluctant to give breastmilk to their babies, in general, there are 2 factors namely internal factors such as knowledge, education, behavior, age and external factors such as work and family support (Arriadna, 2013). The success of Exclusive breastfeeding requires many sectors to participate. One who needs to participate is the posyandu, where posyandu is a container that is often used in socializing maternal and child health programs including exclusive breastfeeding (Diyah, 2015).

According to the Basic Health Research (Riskesdas) (2013), the percentage of breastfeeding only in the last 24 hours and without a history of prelacteal food at 6 months of age was 30.2% (Indonesian Ministry of Health, 2016). Based on the results of Nutrition Status Monitoring (PSG) in 2016, referring to the 2016 strategic plan target of 42%, then the coverage of exclusive breastfeeding for infants under the age of six months was 54.0%, reaching the target. According to 34 provinces in Indonesia the highest coverage of exclusive breastfeeding for infants aged 0-5 months is East Nusa Tenggara (NTT) 79.9% and the lowest is Gorontalo, which is 32.3%, while in Yogyakarta province is around 70.9% (Ministry of Health RI, 2017).

Infants who get exclusive breastfeeding in 2017 in Yogyakarta province the highest coverage is Sleman regency at 82.62% and the lowest coverage is in GunungKidul regency which is 66.75% (DI

Yogyakarta Health Profile, 2018). The highest exclusive breastfeeding coverage was in Godean I public health center, namely 93.73% and the lowest was in Gamping II health center, which was 56.59% (Sleman District Health Office, 2018).

Based on the background above, the researchers want to know the contextual influence of posyandu strata and maternal factors on exclusive breastfeeding in Sleman Yogyakarta 2018.

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## SUBJECTS AND METHOD

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### 1. Study Design

This was an analytic observational study with a cross sectional design. This study was conducted at Godean I Community Health Center by considering the high level of exclusive breastfeeding coverage and Gamping II Health Center considering the low coverage of exclusive breastfeeding in the region. This was conducted from November 22 to December 20, 2018.

### 2. Population and Samples

The source population in this study was infants aged 7-12 months in the work area of Godean I Health Center and the working area of Gamping II Health Center. The number of samples selected was 200 subjects with consideration of the sample being more representative and the sampling technique used was stratified random sampling at the posyandu level. This technique was chosen because the researcher divided the population into strata according to certain characteristics that are considered important, namely posyandu strata including middle, full, and independent. Furthermore, the sample technique chosen was simple random sampling at the individual level. This technique was chosen because the researcher will select samples at each posyandu in a simple random manner. Samples were selected from 25 posyandu units

spread across all strata and 8 subjects were selected from each posyandu.

### 3. Study Variables

The independent variables in this study were knowledge, education, age, parity, distance, work and family support. The dependent variable is exclusive breastfeeding.

### 4. Operational Definition of Variables

Knowledge is the mother's ability to understand and answer questions about exclusive breastfeeding. Low knowledge is coded 0 and high knowledge is coded 1.

Education is the level owned by mothers through formal education used by the government and authorized by the education department. Low education is coded 0 and higher education is coded 1.

Age is the age of nursing mothers when giving exclusive breastfeeding. 1 for <20 or >35 years old and 0 for 20 - 35 years old.

Parity is the status of women in relation to the number of children who have been born. Primiparous parity was coded 0, multiparas were coded 1 and grandemultipara was coded 2.

Birth distance is the difference between babies born with the distance of children born before. Distance <2 years is coded 0 and  $\geq 2$  years are coded 1.

Occupation is a type of work activity carried out by mothers when breastfeeding for example Civil Servants (PNS), traders, tailors, laborers and others. Not working is a mother who only functions as a housewife without being bound by work. Work coded 0 and not working coded 1.

Family support is the existence of support from the family (nuclear or extended family) to the mother during lactation in the form of information, social and emotional support. Support is less coded 0 and support is well coded 1.

Exclusive breastfeeding is a mother who only gives breast milk to her baby from

0-6 months without additional drinks or other foods such as water, formula milk, honey and others. No exclusive breastfeeding is coded 0 and exclusive breastfeeding is coded 1.

### 5. Study Instruments

The research instruments used in this study were questionnaires and notes from the health center. The validity test in the questionnaire of this study was carried out on mothers who had babies aged 7-12 months consisting of 30 respondents. Reliability testing was done by measuring variables using the SPSS 22 statistical program that can calculate total item correlation and Cronbach alpha.

### 6. Data Analysis

The sample characteristics of data on knowledge, education, age, parity, distance of birth, work and family support are described in n and%. Bivariate analysis was done using Chi-square test. Multivariate analysis was conducted by multilevel analysis.

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## RESULTS

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There was an effect of maternal knowledge on exclusive breastfeeding. Mothers who have high knowledge on exclusive breastfeeding have a logit to give exclusive breastfeeding by 2.67 units higher than mothers with lack of knowledge ( $b = 2.66$ ;  $CI\ 95\% = 0.85$  to  $4.47$ ;  $p = 0.004$ ). There was an effect of maternal education on exclusive breastfeeding. Highly-educated mothers have a logit to give exclusive breastfeeding by 2.10 units higher than low-educated mothers ( $b = 2.10$ ;  $CI\ 95\% = 0.29$  to  $3.91$ ;  $p = 0.023$ ). There was an effect of maternal age on exclusive breastfeeding.

Mothers who were in the age of healthy reproduction have a logit to give exclusive breastfeeding by 3.35 units higher than mothers who were not in healthy

reproductive age ( $b=3.35$ ; CI 95%= 1.46 to 5.24;  $p<0.001$ ).

**Table 1. Description of researcher variables**

Variable	Characteristics	N	%
<b>Knowledge</b>	Low	44	22
	High	156	78
<b>Education</b>	Low	51	25.5
	High	149	74.5
<b>Age</b>	<20 or >35 years old	50	25
	20-35 years old	150	75
<b>Parity</b>	Primiparous	53	26.5
	Multiparous	147	73.5
<b>Distance</b>	<2 years	57	28.5
	$\geq 2$ years	143	71.5
<b>Occupation</b>	Working	29	14.5
	Not working	171	85.5
<b>Family Support</b>	Weak	43	21.5
	Strong	157	78.5

There was an effect of maternal parity on exclusive breastfeeding. Mothers who have multiparous parity and grandemulti-para have a logit to give exclusive breastfeeding by 1.90 units higher than primipara ( $b=2.90$ ; CI 95%= 0.41 to 3.39;  $p= 0.012$ ). There was an effect of maternal pregnancy gap on exclusive breastfeeding. Mothers who have a pregnancy distance of  $\geq 2$  years have a logit to give exclusive breastfeeding by 2.91 units higher than <2 years ( $b=2.91$ ; CI 95% 0.92 to 4.89;  $p=0.004$ ).

There was an effect of maternal employment on exclusive breastfeeding. Mothers who did not work have a logit to provide exclusive breastfeeding 4.53 units

higher than working mothers ( $b=4.53$ ; CI 95%= 2.39 to 6.67;  $p<0.001$ ). There was an effect of family support on exclusive breastfeeding.

Mothers who received family support about giving exclusive breastfeeding had a logit of 2.89 units higher than those who did not get family support ( $b=2.88$ ; CI 95%= 1.04 to 4.72;  $p=0.002$ ).

In table 3, the results showed that there was a contextual effect of health center on exclusive breastfeeding. ICC = 29.2% mean that 29.2% of the variation in exclusive breastfeeding was determined at the health center level.

**Table 2. The results of Chi-square test**

Variable	Category	Exclusive breastfeeding				OR	CI(95%)		p
		No		Yes			Lower Level	Upper Level	
		n	%	n	%				
Knowledge	Low	19	43.2	25	56.8	7.85	2,26	27.28	0.001
	High	21	13.5	135	86.5				
Education	Low	20	39.2	31	60.8	4.75	1.27	17.67	0.020
	High	20	13.4	129	86.6				
Age (years)	<20 or >35	23	46	27	54	15.08	4.0	57	<0.001
	20-35	17	11.3	133	88.7				
Parity	Primiparous	23	43.4	30	56.6	5.0	1.43	16.75	0.011
	Multiparous	17	11.6	130	88.4				
Distance	<2 years	22	38.6	35	61.4	9.37	2.35	37.32	0.002
	$\geq 2$ years	18	12.6	125	87.4				
Occupation	Working	17	58.6	12	41.4	49.03	9.77	245.96	<0.001
	Not working	23	13.5	148	86.5				
Family Support	Low	18	41.9	25	58.1	11.26	2.84	44.52	0.001
	High	22	14	135	86				

**Table 3. The Result of Multilevel Analysis**

Independent Variables	b	(CI 95%)		p
		Lower limit	Upper limit	
<b>Fixed effect</b>				
Knowledge	2.66	0.85	4.47	0.004
Education	2.10	0.29	3.91	0.023
Age	3.35	1.46	5.24	<0.001
Parity	1.90	0.41	3.39	0.012
Distance	2.91	0.92	4.89	0.004
Employment	4.53	2.39	6.67	<0.001
Family support	2.88	1.04	4.72	0.002
<b>Random effect</b>				
Health center				
Var (constants)	1.35			
ICC=29,2%				
Likelihood Ratio Test p=	-39,40			

## DISCUSSIONS

### 1. The effect of maternal knowledge on exclusive breastfeeding

There was an effect of maternal knowledge on exclusive breastfeeding. Mothers who have high knowledge on exclusive breastfeeding have a logit to give exclusive breastfeeding by 2.67 units higher than mothers with lack of knowledge (b= 2.66; CI 95% 0.85 to 4.47; p=0.004).

Based on a study by Emilda (2011) it was stated that there was a significant relationship of maternal knowledge and exclusive breastfeeding which can be seen from the score of CI 95%= 1.29-4.07. Mothers who have high knowledge on exclusive breastfeeding have a logit to give exclusive breastfeeding by 2,29 units higher than mothers with lack of knowledge.

The result of this study was in line with a study done by Mogre V et al. (2016) about the knowledge, attitudes and determinants of exclusive breastfeeding practices in nursing mothers in the village of Ghanaian, the results showed that mothers who had high knowledge had a chance of 5.9 times (95% CI 2.6-13.3) to give exclusive breastfeeding to their babies.

A previous study by Rachmaniah (2014) about the relationship between the

level of knowledge of mothers about breast milk and exclusive breastfeeding. The results of this study indicated that there was a significant relationship between the level of maternal knowledge about breastfeeding with exclusive breastfeeding. From the results of the chi square test, the score of p = 0.008.

In this study, most of the mothers who gave exclusive breastfeeding to their babies were highly knowledgeable. This proved that knowledge was very important because it can give effect to changes in a person's behavior.

Knowledge was one of the important factors in the success of exclusive breastfeeding. A mother who has low knowledge of exclusive breastfeeding can be the cause of failure of exclusive breastfeeding. A mother must received intensive information about both the content, the benefits of breastfeeding, breastfeeding techniques and their disadvantages if a mother did not give exclusive breastfeeding to her baby (Wahyuningsih, 2012).

### 2. The effect of maternal education on exclusive breastfeeding

There was an effect of maternal education on exclusive breastfeeding. Highly-educated mothers have a logit to give exclusive

breastfeeding by 2,10 units higher than low-educated mothers ( $b= 2.10$ ; CI 95% 0.29 to 3.91;  $p=0.023$ ).

The result of this study was in line with a study by Kristiansen et al. (2010) about factors related to exclusive breastfeeding and breastmilk in Norway, the results showed that mothers who had higher education had a chance of 3.87 times (95% CI 1.83-8.17) to give breast milk for up to 6 months to their babies.

A study by Hartini (2014) also showed that there was a significant relationship between maternal educational level and the success of exclusive breastfeeding.

In this study, most of the mothers who gave exclusive breastfeeding were highly educated mothers. Education was very influential on someone's knowledge, the higher the person's education, the more knowledge that she/he would have so that it can change a person's behavior.

Education was very influential on exclusive breastfeeding because the higher a person's education, the easier it would be to get information so that more knowledge was expected to be obtained, on the contrary, the lower a person's education, the lower the information that she/he got including exclusive breastfeeding (Wahyuningsih, 2012).

Education was any effort that is planned to influence other people, individuals, groups or communities so that they did what was expected by education actors (Haryani, 2014).

### **3. The effect of maternal age on exclusive breastfeeding**

There was an effect of maternal age on exclusive breastfeeding. Mothers who were in the age of healthy reproduction have a logit to give exclusive breastfeeding by 3.35 units higher than mothers who were not in healthy reproductive age ( $b=3.35$ ; CI 95% 1.46 to 5.24;  $p<0.001$ ).

The result of this study was in line with a study by Untari (2017) which stated that there was an effect of maternal age on exclusive breastfeeding. The results of the analysis showed that there was a significant effect of maternal age on the provision of exclusive breastfeeding. Looking at the percentage comparison of research results, mothers of reproductive age were less likely to give exclusive breastfeeding, and women with high risk were more likely to succeed in exclusive breastfeeding. The results of this study found that the oldest age for giving exclusive breastfeeding was in the age range of 20-35 years old by (74.1%) compared to those who were  $<20$  or  $> 35$  years old.

In this study most of the mothers who gave exclusive breastfeeding were mothers in the age range of 20-35 years old because that was an ideal reproductive age for a woman.

Age was an important variable in the cycle of human life. The best age for healthy reproductive was in the range of 20-35 years old. At this age, it was considered as a golden period to reproduce because the functions of the reproductive organs were considered mature so they were ready for pregnancy, childbirth, and breastfeeding (Septiani, 2017).

Breastfeeding was influenced by age. Age less than 20 years old was a period of growth including the reproductive organs (breasts), the younger the mother's age, the smaller the breastfeeding for infants due to social demands, maternal psychology and social pressure that can affect breast milk production. The age of 20-35 years old was the ideal age to produce optimal breast milk and physical and spiritual maturity in the mother has been formed. At the age of more than 35 years old, the reproductive organs were weak and not optimal in giving exclusive breastfeeding (Hidajati, 2012).

#### **4. The effect of parity on exclusive breastfeeding**

There was an effect of maternal parity on exclusive breastfeeding. Mothers who have multiparous parity and grandemultipara have a logit to give exclusive breastfeeding by 1.90 units higher than primipara ( $b=2,90$ ; CI 95% 0,41 up to 3,39;  $p=0,012$ ).

The result of this study was in line with a study by Untari (2017) For parity, the majority of mothers who provide exclusive breastfeeding were multiparas by 23 people (57.5%). Mothers who have 1-2 children were more likely to provide exclusive breastfeeding by 10 times compared to mothers who did not have the number of children.

The result of this study was supported by a study by Sinta (2017) which showed that there was an effect of parity on exclusive breastfeeding and it was statistically significant. Multiparous mothers increased the likelihood of exclusive breastfeeding than primiparous mothers ( $b= 1.72$ ; 95% CI= 0.57 to 2.86;  $p= 0.003$ ). The results of this study were also supported by previous research (Draman et al., 2017), which stated that mothers with more than 1 parity were 29.13 units more likely to give exclusive breastfeeding than mothers with less than 1 parity (OR= 29.13; 95% CI= 9.63 to 88.12). Mothers who have more than 1 child have had previous breastfeeding experience so they tend to be better at giving exclusive breastfeeding to their babies.

Parity was very influential on someone's acceptance of knowledge, the more the experiences a mother has, the easier the acceptance of knowledge. Something experienced by someone would increase the knowledge gained. Experience as a source of knowledge was a way to obtain the truth of knowledge by repeating the knowledge gained in solving the problems in the past (Mabud, 2014).

#### **5. The effect of labor distance on exclusive breastfeeding**

There was an effect of maternal pregnancy gap on exclusive breastfeeding. Mothers who have a pregnancy distance of  $\geq 2$  years have a logit to give exclusive breastfeeding by 2.91 units higher than  $< 2$  years ( $b=2,91$ ; CI 95% 0,92 up to 4,89;  $p=0,004$ ).

The result of this study was not in line with a study done by Untari (2017) which stated that for birth spacing with the last child, most mothers did not provide exclusive breastfeeding which was  $> 1$  year distance from the last child by 27 people (67.5%). For statistical analysis, there was no significant relationship between distance of birth and exclusive breastfeeding.

In this study, most of the study subjects had labor distance for  $\geq 2$  years. Birth distance  $\geq 2$  years was the ideal distance for the mother to plan the next pregnancy, because in addition to the system of reproductive organs that have recovered, she can also focus on taking care of her baby first, especially in terms of breastfeeding.

Labor distance was the period between two consecutive live births of a woman (BKKBN, 2011). Meanwhile, according to the United States Agency (USAID) the optimal labor distance was the time limit between births which resulted in the best health effects for pregnancy, mother, newborn, and the whole family. The difference between the results of the analysis with the theory of was due to the existence of socio-cultural factors, lack of knowledge of pregnant women, families and communities on the importance of breastfeeding, as well as the ranks of health who have not fully supported.

#### **6. The effect of maternal employment on exclusive breastfeeding**

There was an effect of maternal employment on exclusive breastfeeding. Mothers

who did not work have a logit to provide exclusive breastfeeding 4.53 units higher than working mothers ( $b=4,53$ ; CI 95% 2,39 up to 6,67;  $p=0,000$ ).

The result of this study was in line with a study done by Sari TK (2015) about the factors related to failure of Exclusive Breastfeeding which stated that there was a significant relationship between maternal employment and the failure of Exclusive breastfeeding in the working area of the Pringapus Community Health Center in Semarang Regency with the score of  $p=0,000$  and the score of  $OR=6,714$  which mean that working mothers were 6 times more likely to have failure of exclusive breastfeeding compared to mothers who did not work.

The result of this study was in line with a study done by Sinta et al (2017) which stated that there was an effect of work on exclusive breastfeeding and it was statistically significant. Mothers who work reduce the possibility of exclusive breastfeeding than mothers who did not work ( $b=-2,94$ ; CI 95% = -3.99 to -1.88;  $p=0,001$ ).

In this study, most of the research subjects did not work so they had a lot of free time to give breast milk to their babies. Mothers who did not work have more opportunities to give exclusive breastfeeding than mothers who work. The cause of working mothers cannot give exclusive breastfeeding was due the regulation of day off was limited so the mother must provide a substitute for breast milk.

Work was an economic activity that aimed to generate income to fulfill the needs. This did not only happen to men or husbands, but it can also be done by women or a mother. Working mothers have a potential of 3.5 times lower in giving exclusive breastfeeding to their babies (Tan, 2011).

## **7. The effect of family support on exclusive breastfeeding**

There was an effect of family support on exclusive breastfeeding. Mothers who received family support about giving exclusive breastfeeding had a logit of 2.89 units higher than those who did not get family support ( $b=2,88$ ; CI 95% 1,04 up to 4,72;  $p=0,002$ ).

The result of this study was supported by a study by Emilda (2011) about the influence of family support in exclusive breastfeeding on working mothers in Langsa City which showed that there was a significant relationship between family support and exclusive breastfeeding, this can be seen from the  $p$  score = 0,000 and 95% CI = 1,92-6,02 where opportunities respondents who received the support of 30 families were 3.4 times more likely to give exclusive breastfeeding compared to those who did not get family support.

In this study, family support especially husband's support was very influential in achieving the success of exclusive breastfeeding because the family was the closest people who can influence the psychological conditions and maternal attitudes towards exclusive breastfeeding.

According to Sudiharto (2007), family support was support for motivating mothers to give breast milk to their babies until the age of 6 months old including providing psychological support to mothers and preparing balanced nutrition to mothers. Friedman in Sudiharto (2007) stated that basic family functions include effective functions, which were the internal function of the family to fulfill psychosocial needs, nurture each other, provide love, accept and support each other. Husbands and families can play an active role in breastfeeding by providing emotional support or other practical assistance (Roesli, 2007)

### **8. The effect of health center on exclusive breastfeeding**

That there was a contextual effect of health center on exclusive breastfeeding. ICC = 29.2% mean that 29.2% of the variation in exclusive breastfeeding was determined at the health center level.

The result of this study was in line with a study done bySinta (2017). The results of multilevel analysis were shown by ICC = 28.87%. The indicator showed that the health center condition in each strata has a contextual influence on the variation of exclusive breastfeeding by 28.87%.

In this study, health center has a contextual effect on exclusive breastfeeding. This was because health center was a place where all forms of information about maternal and child health were given, including exclusive breastfeeding.

Health center was one form of human resource health efforts that were managed and organized from, by, for and with the community in the implementation of health development. To empower the community and provide convenience to the community in obtaining basic health services. The most important thing was to accelerate the reduction of maternal and infant mortality (Ministry of Health, 2010).

Health center was one of the health services in the village to help people to know or check their health, especially for pregnant women and toddlers. The family activeness in each health center would certainly affect the nutritional status of their children because one of the objectives of the health center was to monitor the improvement of the nutritional status of the community, especially toddlers and pregnant women (Adisasmito, 2007).

According to the Indonesian Ministry of Health (2011), the development of each health center was not the same. Therefore, the training carried out for each health

center was also different. To find out the level of development of the health center, a method and tool for the development of health center has been developed, known as the Health Center Self-Reliance Study, which aimed to determine the level of development of health center.

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