

## HANDLING AND STORAGE OF EXPRESSED BREAST MILK: KNOWLEDGE AND PRACTICE AMONG WORKING LACTATING MOTHERS AT A SELECTED PRIVATE WOMEN & CHILDREN'S HOSPITAL

Nabilah Nordin<sup>1</sup>, Zaima Mat Yusuf<sup>2</sup>, Yee Bit-Lian<sup>1\*</sup>

<sup>1</sup>Open University Malaysia, Faculty of Technology and Allied  
Sciences

<sup>2</sup>King Abdul Aziz Medical City, Riyadh, Ministry of National  
Guard Health Affairs

### ABSTRACT

*Breastfeeding offers many benefits for both the mother and the child. The first step toward healthy nutrition is a successful breastfeeding start. Breastfeeding is a natural stage following delivery and a unique gift from a mother to her child. In neonatal facilities and many homes, particularly among working women who must return to work shortly after birth, the use of expressed breast milk has been promoted as an efficient method of storing expressed breast milk for any significant length of time if necessary. The goal of the research was to evaluate working women's knowledge, attitudes, and practices regarding breast milk expression and preservation at Hospital D. A cross-sectional study of 120 working women at Hospital D was conducted. To determine knowledge and practice, a structured questionnaire with open and closed-ended questions was utilised, while a Likert scale was used to examine mothers' views regarding breast milk expression and storage. The study revealed knowledge gaps in the expression and storage of breastmilk that need to be addressed to enable the mothers to fully*

*utilize the lactation and breastfeeding experience even though they have a busy work-life schedule.*

**Keywords:** *Working women, workplace, breastfeeding, breast milk storage, breast milk expression.*

**Corresponding author:** Yee Bit-Lian can be contacted at [yeebitlian5448@gmail.com](mailto:yeebitlian5448@gmail.com)

## **1. INTRODUCTION**

Exclusive breastfeeding as defined by the World Health Organization (WHO), is the practice of giving an infant breast milk only, without additional food or drink. Every infant is suggested to receive breast milk via breastfeeding exclusively starting from child's birth until six months old followed by continued breastfeeding with suitable complementary food for up to two years beyond (WHO, 2019). Malaysia is one of the countries that promotes and supports breastfeeding through various strategies including the Baby-Friendly Hospital Initiative since 1992, training of health staff and 90 days of maternity leave for women working in the government sector (Ismail et al., 2012).

Not all women are fortunate enough to send their infant to the caretaker who is in the workplace, which is easier for them to breastfeed their infants in between working time. Alternatively, expression of breast milk will allow them to give their breast milk continuously to their infants by giving it to the others referred to care taker for feeding her infants while their infant is in care taker's home (Labiner-Wolfe et al., 2008). For those mothers who are expressing their breast milk when they have been separated from their infant, usually they will usually have

felt that their infant is with them even realistically their infants are not with them. Lack of milk production or limited production of breast milk are the common reasons given by working lactating mothers for not to breastfeed her infant (Arora et al., 2000).

There are still many women, especially career women who are not really knowledgeable and competent on handling and storage of breast milk. They are not well- informed regarding breast milk expression procedure. There was a study conducted among women working at a university of Kelantan, and Malaysia already found out that there is a lack of knowledge regarding storage and use of expressed breast milk (Ismail Tengku Alina, Zaharah, 2012). Apart from that, a study conducted in the state of Selangor, Malaysia has shown that the provision of a refrigerator at the workplace was important for continuation of breastfeeding (Amin et al., 2011).

Generally, expressed breast milk can be kept for certain durations but it depends on how the breast milk is stored. Breast milk can be left for 4 hours in a room with temperature about 25 degree Celsius and 37 degree Celsius, whereas if it is stored in a deep freezer, it can be stored for up to six months (Ministry of Health, 2009; Muiz, 2016). The correct way of storing breast milk may allow infants to get clean, nutritious milk, free of contamination and allow infants to get enough supply of milk stock in a longer period.

Physiologically, during direct breastfeeding, infants sucking directly from the mother's breast and this action has lower risk of milk contamination. On the other hand, expressed breast milk is differ from direct breastfeeding. Expressed breast milk is not

entirely free of bacterial contamination because it has been expressed and then put in the container. The risk is still there because bacteria can enter into the milk during expression, through the equipment used and also from the skin.

Improved knowledge and practices regarding handling and storage of breast milk among working lactating mothers may help to build a high confidence level of a breastfed mother to continue giving her infant breast milk instead of formula milk. Ironically, there are still a lot of women, especially working lactating mothers, who are not adequately enriched with the knowledge of breast milk expression especially when it comes to the way of handling and storage of breast milk. There is one study conducted in Selangor, a refrigerator at the workplace was found to be an important factor in ensuring continuation of breastfeeding (Amin et al., 2011). Expressed breast milk should be kept in the refrigerator for working lactating mothers who expressed their breast milk while in working time. Providing a refrigerator alone at their work place might not be sufficient enough if the women were not convinced of its safety and hygiene.

Workers were not encouraged to store their breast milk in common refrigerators with wide access because of the risk of contamination and tampering (Slusser et al., 2004). However, this situation cannot be an excuse for women to take it lightly because they still can use the common refrigerator. They should know that the milk containers should be properly covered, clearly labeled with their infant's name, date and time of expression. Furthermore, it is really crucial for them to get good support from their colleagues so that the hygiene and

temperature setting of the refrigerator could be maintained at their maximum. The objective of this study is to determine the knowledge and practice regarding handling and storage of expressed breast milk among working lactating mothers at Hospital D Women and Children.

## **2. REVIEW OF LITERATURE**

Breast milk has been accepted as a superfood that is really beneficial for an infant. It is the best source of nutrition for an infant by virtue of the uniqueness of its biological composition. Breastfeeding is a well-known best method of feeding for an infant and it really contributes to the well development of an infant. Not all functioning lactating mothers who send their new born child at overseer's house are blessed to discover a guardian's home close to their working environment and empower them to breastfeed their baby in the middle of working time (Martin, 2016). Besides that, the outflow of breast milk is probably going to help moms in lessening the instance of breast engorgement, mastitis among breastfeeding moms. As a matter of fact, when the mother is continually discharging their breast by manual breast or breast siphoning gadget, the danger of getting breast engorgement and mastitis is lesser (Vijayalakshmi et al., 2021). This is the very circumstance that will happen to the moms who are giving their new born child breastfeeding straightforwardly.

Breast milk is undeniably more better nourishing contained as thought about than recipe milk. Yet, this truly relies upon how it has been communicated, put away, and defrosted. Breast milk is a characteristic arrangement that is so impressively planned by an individual mother's body for their new born child that can

never be imitated in a plant. As breast milk involves 88% water, it keeps the breastfed newborn child very much hydrated as well. Breast milk is effortlessly processed when contrasted with equation milk, hence decreasing the rate of stomach related problems like colic, looseness of the bowels, and reflux particularly in untimely infants (Martin, 2016).

Busy or mothers with working responsibilities who are also lactating moms these days actually can be seen rehearsing a breast milk articulation for their baby. In any case, information and practice towards dealing with and capacity of breast milk actually need to be precluded further. Also, despite the fact that the elite breastfeeding rates have been low across the globe in spite of its advantages, the circumstance has gotten deteriorated over the most recent couple of a very long time because of expanding cooperation of nursing moms in everyday work and the pervasive insufficient help for breastfeeding at the work environment (Brown et al., 2014).

A choice made by a functioning lactating mother to communicate breast milk is viewed as dependent on a couple of components. As a rule, factors that seem, by all accounts, to be related with ladies' choice to communicate breast milk as a choice have been accounted for in certain papers. A portion of the components are ladies who are confronting troubles in building up breastfeeding and are bound to communicate and moms with untimely or low birth weight babies, moms who are unwell, and the individuals who have not beforehand breastfed are additionally bound to communicate (Stuebe, 2020).

Aside from that, there have been some encouraging variables that upheld working lactating moms to breastfeeding at work

like admittance to isolated rooms, adaptable chance to breastfeed and breastfeeding breaks, manager's help, and social demeanour towards breastfeeding. In any case, there are likewise a few issues that have been found to disturb a mother's breastfeeding plan at work. Usually, distinguished issues incorporate absence of work environment breastfeeding offices, absence of family support, moms' insufficient information about breastfeeding and sensation of humiliation, just as absence of security for breastfeeding, spot to store breast milk (cooler), restricted paid maternity leave, and dread over work uncertainty (Brown et al., 2014).

A lot of literature reviews have been found in issues related to breastfeeding but not many literature reviews can be found related to expression of breast milk. Apart from that, literature reviews that are available are not really related and focus on the handling and storage of EBM as interested by a researcher.

### **3. METHODOLOGY**

#### **3.1 Study Design**

A cross-sectional quantitative method was chosen for this particular study with approaches that determined the knowledge and practices ((Pilot & Beck, 2014) regarding handling and storage of expressed breast milk among working lactating mothers at Hospital D.

In this study, the research was conducted at Hospital D. This is one of the referred hospitals in Putrajaya, Malaysia. This hospital comprises licenced beds to accommodate patients for hospitalization. The reason this hospital was chosen because it able to receive and manage many types of cases units of paediatric, obstetrics and gynaecology. This study will be

involving inpatient and outpatient areas at this hospital. All working lactating mothers at this hospital were enrolled as participants.

### **3.2 Population and sample**

For the purpose of this study, the target population was working lactating mothers who were in Hospital D, and this selection is not focused on any occupation and position. All working lactating mothers who were in D Hospital during the period of data collection and volunteered to take part in the survey will be selected.

Inclusion criteria were the criteria for including a person in a study. In this study, a woman who was practicing expressing breast milk and at the same time played a role as an employee will be included in this study. Thus, women who were in Hospital D during the period of data collection were accepted in this study. Women who did not consent to this study were excluded from this study.

### **3.3 Sampling, Sample size and Instrument**

In this research study, a convenience sampling was chosen by a researcher to distribute the questionnaire. The researchers obtained a sample size of 108 working lactating mothers who were eligible for this study. The figure was decided based on Krejcie and Morgan (1970) table-used.

Self-administered with a close and open-ended questionnaire using a Likert-type scale consisting of five-points has been used as an instrument in this study. The instrument used to consist of two sections that focused on knowledge and practice on handling and storage of expressed breast milk among working lactating mothers. The questionnaires were distributed to



selected working lactating mothers at D Hospital. The first part of the questionnaire is a demographic data which asks about age, highest qualification level, marital status, years of marriage, total number of children in the family, occupation and average income per month. Second part in these questionnaires aimed to identify knowledge and practice of handling and storage of expressed breast milk among working lactating mothers.

### **3.4 Reliability and Validity**

Reliability is one of important things to the researcher as it will ensure the quality of the instrument used for the study (In, 2017). Cronbach Alpha more than .65 is acceptable for this study (Pilot & Beck, 2014). In this study, in order to determine the content validity of the study, there are expert's suggestions and opinions such as lactation nurse, nurse educator, maternity nurse manager.

## **4. DATA ANALYSIS**

In this study, researchers used a set of questionnaires to obtain information regarding working lactating mother's knowledge and practices on handling and storage of expressed breast milk, after sought ethical considerations from OUM and D Hospital.

This data was collected only once from each working lactating mother in order to allow larger sample size for the study. This study is involving all areas (in-patient and outpatient), departments and units in D Hospital. The questionnaire was given to the all working lactating mother in D Hospital. A letter with information sheet outlining the study, and self- reporting questionnaire were distributed to all working lactating mothers in D Hospital by hand. This is to ensure confidentiality of the

answers and participant's identity will not be disclosed in the reports.

Table 1. Frequency and percentages demographic data (N=122)

		Frequency	Percentage
Age	18-30	53	42.62
	31-40	59	48.36
	41-50	11	9.02
Educational Qualification	Certificate	20	16.4
	Degree	31	25.4
	Diploma	55	45.1
	Master	16	13.1
Married Duration	<1 year	19	15.57
	1-5 years	58	47.54
	>5 years	45	40.18
Number of children	1	63	50.8
	2	36	29.5
	3	9	7.4
	4	7	5.7
	5	5	4.1
	6	2	1.6
	7	1	.8
Occupation	Professional	47	38.5
	Non-Professional	75	61.5
Income group	>RM4000	21	17.2
	RM1001-2500	47	38.5
	RM2501-4000	48	39.3
	RM500-1000	6	4.9

Table 2. Knowledge and practice of handling and storage of expressed breast milk among working lactating mothers. (N=122)

	Frequency	Percentage
Q1: Breast milk can be stored at room temperature for?		
4 hours	102	83.6
8 hours	11	9.0
12 hours	6	4.9
48 hours	3	2.5
Q2: Breast milk can be stored in refrigerator for less than 8 days.		
No	47	38.5
Yes	75	61.5
Q3: How long breast milk that is stored in the freezer compartment inside the refrigerator (one-door fridge) can be kept?		
a) 2 Week	41	33.6
b) 3 Month	53	43.4
c) 6 Month	25	20.5
d) 12 Month	3	2.5
Q4: Breast milk that has been expressed can be stored in the clean and close containers.		
No	4	3.3
Yes	118	96.7
Q5: Breast milk that has been expressed should be labelled with infant's name, date and time of expression each time you store your breast milk?		
No	1	.8
Yes	121	99.2
Q6: Breast milk need to be arranged in order according to the principle of FIFO (first in, first out).		
No	3	2.5
Yes	119	97.5
Q7: Breast milk that has been expressed at workplace should be kept in the refrigerator first while waiting time for bring it back home using a cooler bag/ box.		
No	5	4.1
Yes	117	95.9
Q8: Do you perform hand hygiene prior to expressing breast milk procedure?		
(1) Never	4	3.3
(2) Seldom	1	.8
(3) Sometimes	4	3.3
(4) Frequently	12	9.8
(5) Always	101	82.8
Q9: Do you store your expressed breast milk in a clean and close container?		
(1) Never	4	3.3

(4) Frequently	4	3.3
(5) Always	114	93.4
Q10: Do you defrost your breast milk in a luke warm water prior giving the milk to your infant?		
(1) Never	8	6.6
(2) Seldom	1	.8
(3) Sometimes	3	2.5
(4) Frequently	14	11.5
(5) Always	96	78.7
Q11: If yes, do you store it back in the refrigerator?		
(1) Never	96	78.7
(2) Seldom	10	8.2
(3) Sometimes	7	5.7
(4) Frequently	3	2.5
(5) Always	6	4.9
Q12: Breast milk that has already been given to your infant and still has remainder/balance, do you still give it to your infant if it has already exceeded more than one hour?		
(1) Never	91	74.6
(2) Seldom	13	10.7
(3) Sometimes	11	9.0
(4) Frequently	3	2.5
(5) Always	4	3.3
Q13: If you decided to thaw your expressed breast milk that has been kept in the freezer, do you shift it to the chiller compartment first then bring it out and thaw at room temperature for about 10-15 minutes before placing it in the lukewarm water?		
(1) Never	17	13.9
(2) Seldom	8	6.6
(3) Sometimes	14	11.5
(4) Frequently	26	21.3
(5) Always	57	46.7
Q14: Do you always practice labelling your expressed breast milk container with your infant's name, date and time of expression?		
(1) Never	4	3.3
(2) Seldom	0	0
(3) Sometimes	1	.8
(4) Frequently	15	12.3
(5) Always	102	83.6
Q15: If yes, do you arrange it in order as according to FIFO principle?		
(1) Never	4	3.3
(2) Seldom	2	1.6
(3) Sometimes	5	4.1
(4) Frequently	12	9.8
(5) Always	99	81.1
Q16: If you decided to express your breast milk at your own workplace, do you store it in the refrigerator while waiting time to bring it back home and bring it back		

using a cooler bag/box?		
(1) Never	7	5.7
(3) Sometimes	6	4.9
(4) Frequently	10	8.2
(5) Always	99	81.1

## 5. DISCUSSION

Age is one of the important variables that has been asked in this study. Table 1.1 shows the summary statistics of Age variable. Age is significantly influenced by working lactating mother's knowledge and competencies on handling and storage of expressed breast milk. In this study, it was found that 48.36% is the highest percentage in this study that represents the age of 31-40 years old. 31-40 can be categorized as a middle age. Most of the respondents that have participated in this study came from this group of ages. 42.62% which represents the age group of 18-30 years working lactating mothers participated in this study. These two age-groups which are 31-40 and 18-30 age groups are known to be in productive age groups for women. Only 9.02% which represents the age group of 41-50 years old working lactating mothers participated in this study.

Qualification level of working lactating mother is one of the variables that has been asked in this study. Working lactating mother's qualification level is known to be an influencer variable for assessing a knowledge and practice of working lactating mother on handling and storage of expressed breast milk. In this study, we have found out that most of the respondents are diploma holders which accounts for about 45.10% from total respondents. Besides that, 25.40% is the second highest percentage in this study which represents a degree holder. The most least in this study was a master holder which represents

13.1% from the total population. Besides that, marital status will not be discussed in depth because all the respondents are married women.

Years of marriage as in Table 3 for working lactating mothers are also known to be a significant variable in this study. 47.54% from the total population which represents 1-5 years of marriage is the largest percentage in this study. 47.54% which accounts for about 58 respondents out of 112 (112 is the total respondents). Apart from that, the lowest least in this study was 15.57% which represents 19 respondents out of 122 totals of respondents. 19 respondents also represent a one-year period of marriage. Years of marrying may influence working lactating mother experiences on handling and storage of expressed breast milk. Next, 46.72% from total respondents which means 57 out of 112 of total respondents have 2-5 children in their family. Besides that, 50.8% of working lactating mothers have one child in their family.

Type of working lactating mother occupation is also the main influencer in this study. In this study, occupation is divided into two categories which is a professional job and non-professional jobs/odd jobs. 61.50% of working lactating mothers who participated in this study worked in a professional job category. Besides that, 38.50% of working lactating mothers work in a non-professional job category. Working time, and a convenient working place are the factors that also influenced working lactating mothers to practice expressing breast milk and thus get an experience and knowledge on handling and storage of breast milk.

Lastly, we have found out 39.30% of working lactating mothers in Hospital D Women & Children gained RM 2501-4000 per month for their salary. 17.20% of them gained more than RM 4000 per month. Besides that, 38.50% of working lactating mothers gained around RM 1001-2500 per month. The lowest percentage in this study is 4.90% which represents a salary around RM 500-1000 per month.

### **5.1 Knowledge and practice on handling of expressed breast milk**

In this study, it is revealed that almost all respondents who participated in this study are capable of handling expressed breast milk correctly. They have demonstrated a good understanding on how to handle expressed breast milk. For example, 96.70% of respondents agreed with the statement that breast milk that has been expressed can be stored in the clean and close containers. The same goes with the statement that breast milk that has been expressed should be labelled with the infant's name, date and time of expression each time you store your breast milk. Around 99,2% of respondents have agreed with it. Apart from that, consistently more than 95% of working lactating mothers had shown a good understanding and capability of handling deep freezer breast milk. It is supported by Ajusi (1989) that mentioned that breast milk that has been stored in the freezer should be shifted in the refrigerator first then placed in the lukewarm water.

### **5.2 Knowledge and practice on storage of expressed breast milk**

In this study, it is revealed that almost all respondents who participated in this study have a good understanding which means they will at least have 80% of understanding regarding storage of expressed breast milk and capable of storing their expressed breast milk in the correct place and temperature. For example, they have demonstrated a good understanding on storage of fresh express breast milk at room temperature correctly. 83.60% of total respondents have agreed that it is about 4 hours for fresh express breast milk to be kept at room temperature. It is correlated with what has been suggested by the Ministry of Health, 2009 that breast milk can be left for 4 hours at room temperature about 25 degree Celsius and 37 degree Celsius. Apart from that, 33.6% from total amount of respondents have been demonstrated a good knowledge on correct duration of storing express breast milk in the freezer compartment inside refrigerator (one-door fridge) which their answered is 2 weeks Around 53 of them (43.4%) answered that breast milk can be stored for 3 months.

### **5.3 Finding of competencies of working lactating mother on handling and storage of expressed breast milk**

Milk that has been expressed by the mother needs to be handled and stored properly to keep the milk's quality, potency and hygiene. As we already know, the use of express breast milk whether it is frozen or fresh, significantly provides both nutritional and immunological benefits especially if their nutritional value is really preserved. In this study, an overall finding has been shown that working lactating mothers who are



participating in this study have competence on handling and storage of express breast milk. For example, 92.60% from the total number of respondents have agreed that hand hygiene is needed prior to expressing breast milk. This is significantly shown that they are aware of the importance of hygienic practices on handling and storage of express breast milk. Poor hygienic practice is one of the possible sources of transmission of bacteria and viruses.

Apart from that, 90.20% of the total number of respondents have shown a good level of understanding and competency on proper technique of defrost express breast milk. This is correlated with the guidelines that prior to administering EBM to the baby, it should be thawed by placing express breast milk in lukewarm water. In addition, if express breasts are in the deep freezer, they need to be shifted to the refrigerator first and then placed in lukewarm water (Rai, 2017).

#### **5.4 Implication to nursing practice**

Poor hygienic practices and lack of knowledge regarding the importance of proper handling and storage of express breast milk have also been one of the contributing factors to milk contamination. It can be possible sources of transmission of bacteria and viruses. Bacterial colonization in breast milk such as colonization of *Cronobacter sazakii* may cause severe systemic infection and meningitis. Therefore, knowledge and high level of competencies of handling and storage of express breast milk are needed in order to prevent the colonization of bacteria and viruses in breast milk. Nurse who is one of the important healthcare staff that is closest to the mother, especially who works in a special care nursery and neonatal

intensive care unit in which these two units will be more prone to handle EBM.

Apart from that, continuation of breastfeeding also can be supported by enhancing knowledge and practice of handling and storage of express breast milk. This is because a proper way of managing express breast milk could be one of the factors that can be a factor that motivates one to continue breastfeeding by expressing their breast milk even though they are separated with their infant for quite some time especially in working time. This will be correlated with World Health Organization encouragement for mothers to breastfeed their infant until 2 years old.

Last but not least, malpractice of handling and storage of express breast milk among nurses especially who are working in special care nursery, neonatal intensive care unit, paediatric ward and maternity ward can be lessened if nurses' knowledge is upgraded. This is one of the good implications to nursing practice if all the nurses are knowledgeable and competent on handling and storage of express breast milk. Upgrading a nurse's knowledge and skills are really crucial as they are the front lines and one of the health educators that plays a role in educating patients and the public. Public will be depending on what has been told and shown by healthcare staff. Therefore, a nurse should always upgrade their knowledge and skills on handling and storage of express breast milk as they will be an educator for their patient and public.

## **6. CONCLUSION, LIMITATIONS & RECOMMENDATIONS FOR FUTURE STUDIES**

In a nutshell, working lactating mother's knowledge and practice on handling and storage of express breast milk are really crucial to be emphasized and upgraded. A lot of advantages can be obtained from correct practicing of handling and storage of breast milk. Apart from that, with the correct and adequate knowledge regarding handling and storage of express breast milk among working lactating mothers will help them to feel more confident and motivate them for continuation of breastfeeding. To continue breastfeeding their infant exclusively up to 2 years old is a challenge for working lactating mothers. Enrich working lactating mothers with adequate knowledge regarding handling and storage of express breast milk is really important and bring a good implication to the healthcare field.

However, this study was not without limitations. Firstly, our findings did not extend the relationship between demographic variables with the working lactating mother's knowledge and practice on handling and storage of express breast milk. Hence, the results cannot be generalised to other states in Malaysia. Secondly, due to the nature of cross-sectional study design; hence, a causal relationship could not be inferred. Finally, our study did not capture other predictors of motivation and hindering factors among the working lactating mother's knowledge and practice on handling and storage of express breast milk. Therefore, we reckon future studies may thus conducting qualitative in-depth interviews to accurately reflect

the feelings of the working mothers on handling and storage of express breast milk.

The recommended ideas are to carry out this research topic to focus on specific groups of the population according to their occupation. For instance, to carry out this research on healthcare staff who are working lactating mothers. Thus, a narrower specific data can be obtained. Apart from that, it is really beneficial for certain organizations if they are able to carry out this kind of specific research. In fact, for the nursing field, this kind of research will be more valuable if it is carried out in a specific ward/unit/department. For example, if this research is done in the paediatric department, it will give feedback to nursing organizations in that hospital setting whether the campaign or health education given previously to the maternal mother is effective. Thus, more enhancement can be made from the results and findings that have been obtained.

Apart from that, a researcher intends to highlight the importance of organization support such as in the hospital, offices, schools, colleges in terms of supporting working lactating mothers for continuation of breastfeeding their child. This can be done by providing a refrigerator for them to keep their EBM in the fridge while waiting time to bring it back. An organization can also provide a special room for their working lactating mother workers to feel comfortable to express their breast milk. This kind of effort will be so helpful in supporting their workers for the continuation of breastfeeding.

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