



RESEARCH ARTICLE

KNOWLEDGE, ATTITUDE AND PREVELANCE OF ALGINATE STORAGE AMONG DENTAL PRACTITIONERS IN CHENNAI

***Mohamad Haikal Bin Zakaria, Dr. Dhanraj, M. and Dr. Sangeetha**

Department of Prosthodontics, Saveetha Dental College, Chennai, Tamilnadu, India

ARTICLE INFO

Article History:

Received 17th February, 2017
Received in revised form
30th March, 2017
Accepted 26th April, 2017
Published online 23rd May, 2017

Key words:

Alginate storage,
Dimensional stability,
Environment,
Dental practitioners,
Awareness.

ABSTRACT

The survey is conducted to assess the knowledge, awareness and practice of alginate storage among the dental practitioners. The aim of the current study was to use representative survey data to examine in the knowledge, awareness and practice of alginate storage among dental practitioners which have different major. The study is a cross-sectional survey. A self-structured, pre-tested questionnaire was used for this survey. Total samples of 50 subjects were included in this study. The result of this study showed that the knowledge, awareness and practice of alginate storage among dental practitioners are quite high.(80%) Generally we can assume that most of the dental practitioners with prosthodontics background have greater awareness and knowledge on hypertension compared to other dental practitioners with different background studies. Moreover, still there is a few numbers of subjects that still do not aware on the proper condition and environment in storing the alginate. Therefore dental practitioners have to work on together in providing a good knowledge, awareness and practice of alginate storage that cannot be looked down. From the result collected, generally we can see that most of dental practitioners have great knowledge and awareness as they know the complications and significances of providing proper condition for alginate storage.

Conclusion: Looking at current study results, they showed a large number of potent and incredible dental practitioners which are aware and have a good knowledge on alginate storage.

Copyright©2017, Mohamad Haikal Bin Zakaria et al. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Citation: Mohamad Haikal Bin Zakaria, Dr. Dhanraj, M. and Dr. Sangeetha, 2017. "Knowledge, attitude and prevalence of alginate storage among dental practitioners in Chennai", *International Journal of Current Research*, 9, (05), 50394-50399.

INTRODUCTION

Alginate impression material is widely used for recording accurate impressions to fabricate various oral appliances such as crowns, bridges, partial dentures and complete dentures. Alginate impressions are dimensionally unstable and hence it should be poured immediately to form exact cast. The impressions are sometimes sent to the nearby laboratories for making cast and models. For maximum dimensional stability, the cast should be poured immediately or it can be stored in lower concentration NaCl or K₂SO₄ solutions during transport to distant laboratories. (Jayaprakash *et al.*, 2014) Time, temperature and humidity can influence the stability of alginate systems. Therefore proper environment and condition should be provided to avoid any complications to happen. This present study was conducted in order to find out the awareness, knowledge and practice of alginate storage among dental practitioners. As with any hydrocolloid, alginates are approximately 85% water (Cook, 1986) and are prone to distortion caused by expansion associated with imbibition (absorption of moisture) or shrinkage due to moisture loss.

(Giordano, 2000; Powers and Sakaguchi, 2006) In addition to water evaporation, impression shrinkage is related to syneresis and associated water exudation onto the impression surface caused by continuing contraction of the colloidal skeletal network even in 100% humidity. (Nallamuthu *et al.*, 2006) Consequently, alginate impressions are not dimensionally stable, leading to decreased dimensional accuracy over time.

MATERIALS AND METHODS

Dental practitioners from various backgrounds are the subjects of this study. Therefore, four dental colleges in Chennai were selected in this survey such as:

- Saveetha Dental College
- Sri Ramachandra Dental College
- MeenaksiAmmal Dental College
- Ragas Dental College

These places were approached due there are so much of dental practitioners from various backgrounds of specialty. The survey has been done from 11th December 2016 till 4th January 2017 in other words, the duration for this survey is 24 days. A self-structured, pre-tested questionnaire was used for this

*Corresponding author: Mohamad Haikal Bin Zakaria,
Department of Prosthodontics, Saveetha Dental College, Chennai, Tamilnadu, India.

survey. Fourteen (14) questions excluded general information was used in the questionnaire. All fourteen (18) closed-ended type questions were included in this questionnaire. A total sample of fifty (50) subjects from various backgrounds of specialty and irrespective of sex was included in this study. Those dental practitioners are approached randomly. All the subjects were approached with a questionnaire and the answers were recorded through an oral interactive session. Hence proper assessment regarding subjects' knowledge on the subject was made and explanation was given to them in case they were unaware. The questionnaires were given as below:

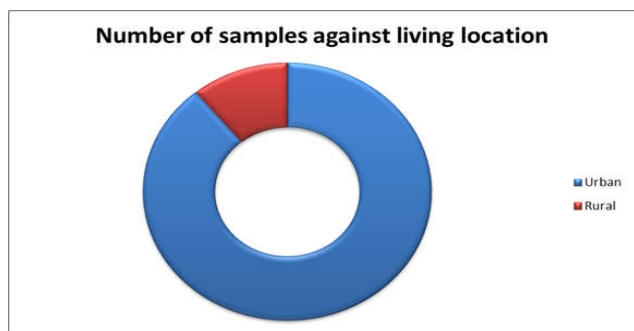
RESULTS

The results of the survey conducted are being illustrated in tables, graphs and charts as shown below. The answers selected by the 50 subjects were analysed for every question. Below are the tables of items selected by all 50 subjects and the analysis was stated below of each table.

Living location

Table 1

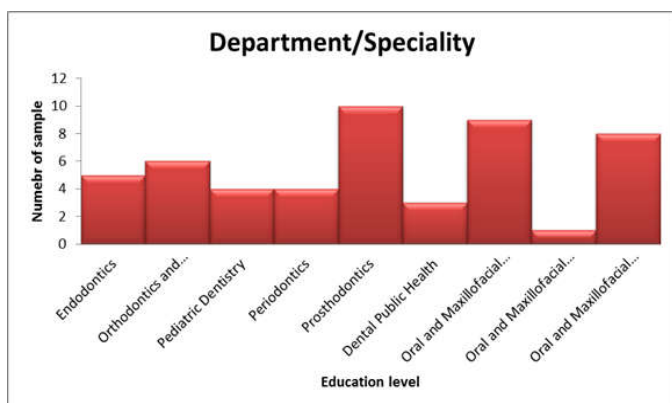
Items	Frequency	Percentage
Urban	45 subjects	90.0%
Rural	5 subjects	10.0%



Department/ Specialist

Table 2

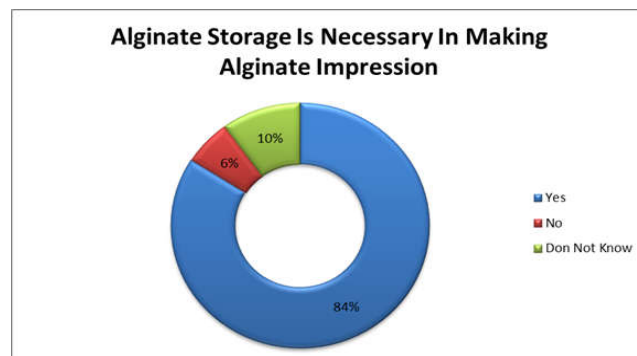
Department/ Specialist	Frequency	Percentage
Endodontics	5 subjects	10.0%
Orthodontics	6 subjects	12.0%
Pediatric	4 subjects	8.0%
Periodontics	4 subjects	8.0%
Prosthodontics	10 subjects	20.0%
Dental Public Health	3 subjects	6.0%
OMFSurgery	9 subjects	18.0%
OMF Radiology	1 subject	2.0%
OMF Pathology	8 subjects	16.0%



Do you think alginate storage is necessary in making alginate impression?

Table 3

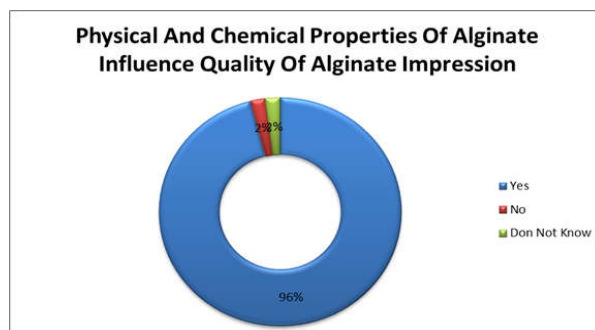
Items	Frequency	Percentage
Yes	42 subjects	84.0%
No	3 subjects	6.0%
Do not know	5 subjects	10.0%



Are you aware that physical and chemical properties can affect the quality of the impression surface while in storage?

Table 4

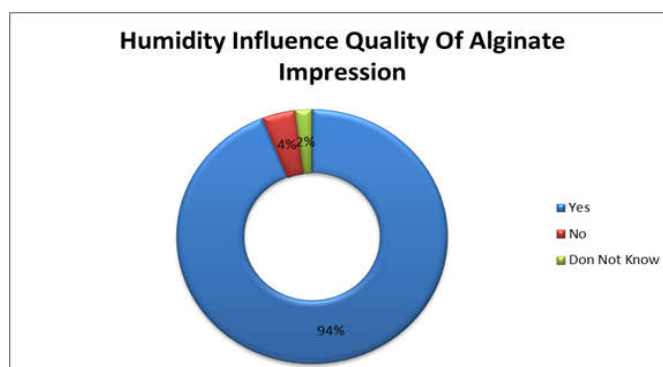
Items	Frequency	Percentage
Yes	48 subjects	96.0%
No	1 subject	2.0%
Do not know	1 subject	2.0%



Do you know humidity can affect the alginate impression?

Table 5

Items	Frequency	Percentage
Yes	47 subjects	94.0%
No	2 subjects	4.0%
Do not know	1 subject	2.0%

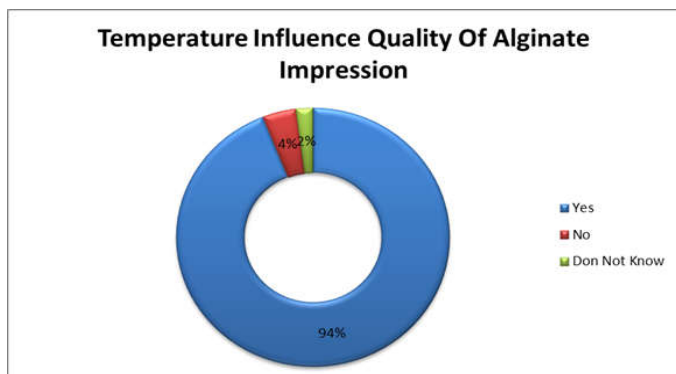


Looking at the results shown in Table 5, there was 94% of the samples were aware that humidity influences the quality of alginate impression while still there is a very few (4%) of them did not aware on that. Only one person did not know about it.

Are you aware that temperature is important in alginate storage environment?

Table 6

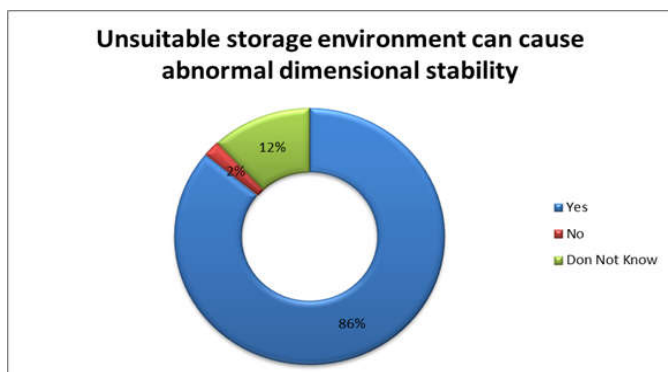
Items	Frequency	Percentage
Yes	47 subjects	94.0%
No	2 subjects	4.0%
Do not know	1 subject	2.0%



Do you know unsuitable storage condition/environment can cause the abnormal dimensional stability of alginate impression ?

Table 7

Items	Frequency	Percentage
Yes	43 subjects	86.0%
No	1 subject	2.0%
Do not know	6 subjects	12.0%



The results shown in Table 7 which are the total of 'yes' or 'no' answer for the question on if they aware on unsuitable storage environment can cause abnormal dimensional stability. There were 86% of the total samples who know about improper storage environment can lead to abnormal dimensional stability while only 2% chose "No" as their answer and the remaining were did not know about it.

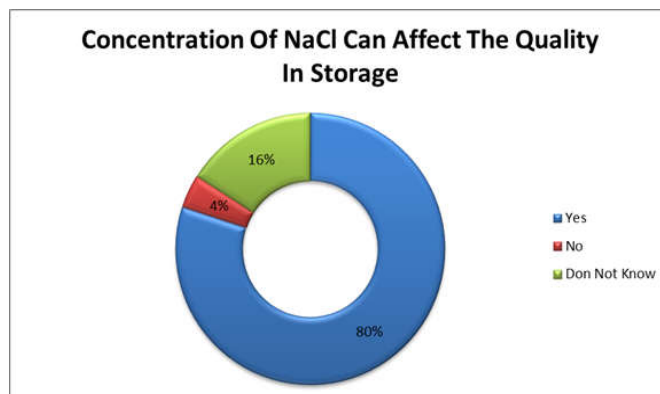
Do you know that concentration of NaCl can affect the alginate quality in storage?

This question's aim was to verify on is concentration of NaCl can affect the quality of impression taken. Looking at the

results shown above, we can see that majority of them which is 80% are aware on it while another 4% and 16% said that being NaCl cannot affect the alginate storage quality and do not even know about it respectively.

Table 8

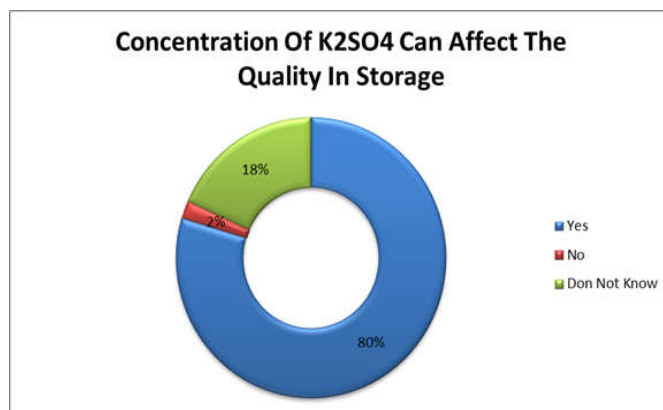
Items	Frequency	Percentage
Yes	40 subjects	80.0%
No	2 subjects	4.0%
Do not know	8 subjects	16.0%



Do you know that concentration of K2SO4 can affect the alginate quality in storage?

Table 9

Items	Frequency	Percentage
Yes	40 subjects	80.0%
No	1 subject	2.0%
Do not know	9 subjects	18.0%

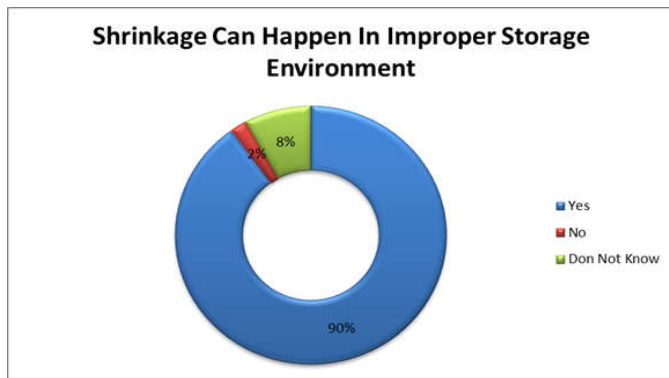


There are 80% were agreed that concentration of K₂SO₄ can affect the quality of impression taken, 2% of 50 samples were did not agree with it. The remaining 18% stated that they did not have idea about it.

Do you know shrinkage of alginate impression can happen in improper storage environment?

Table 10

Items	Frequency	Percentage
Yes	45 subjects	90.0%
No	1 subject	2.0%
Do not know	4 subjects	8.0%

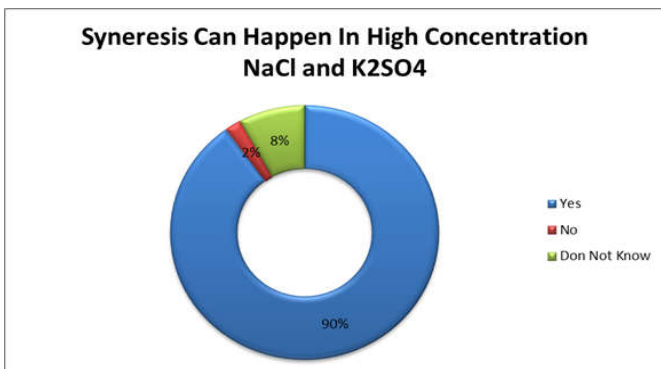


The results obtained showed that the most of them (90%) were aware on shrinkage can happen in improper storage environment.

Do you know more syneresis can occurs in higher concentration of NaCl and K₂SO₄?

Table 11

Items	Frequency	Percentage
Yes	45 subjects	90.0%
No	1 subject	2.0%
Do not know	4 subjects	8.0%



90% of 50 samples were agreed that syneresis can be happened in high concentration of NaCl and K₂SO₄ while another 10% said either alcohol can cause hypertension or did not know about it.

From a scale of 1 to 5, how much do you know about proper method for alginate storage?

Table 12

Scale	Frequency	Percentage
0	0 subject	0.0%
1	0 subjects	0.0%
2	1 subjects	2.0%
3	9 subjects	18.0%
4	22 subjects	44.0%
5	18 subjects	36.0%

Regarding the scale result on how much they know about hypertension shown above, most of them (80%) chose 4 and 5. Only 18% chose 3 which also showed that they still have a moderate knowledge on storing alginate. Unfortunately, although they are small in number but still there is remaining 2% chose scale of 2 over 5. Moreover, not even a single person

chose 0 and 1 which means every 50 samples are aware and have at least have a knowledge on alginate storage.

DISCUSSION

Previous study shows that the storage environment can give such an impact on the dimensional stability of irreversible hydrocolloid alginate impression in dentistry. (Imbery *et al.*, 2010) There are some knowledge on proper environment and condition for alginate storage that should be known and expert especially among dental practitioners which practicing a lot of dental procedures in the treatment. The environment that has a proper humidity, temperature and suitable condition should be applied in maintaining the dimensional stability of alginate impression before pouring the cast. (Hondrum and Fernandez, 1997) Looking at current study results, they showed a large number of potent and incredible dental practitioners which are aware and have a good knowledge on alginate storage. Previous studies also stated that pouring time and storage temperature give effects to the dimensional stability of alginate impression. Several investigations have studied the dimensional stability of alginate-based impression (Hondrum and Fernandez, 1997), and different tests have been developed for analyzing this property (Sawyer *et al.*, 1976). Past studies have shown that these impressions between 0 and 12 minutes are necessary to maintain clinically acceptable accuracy (Jones *et al.*, 1990). Cohen *et al.* (1995) studied the dimensional stability of three different irreversible hydrocolloid impression materials under five different storage conditions. Storing of the impressions was carried out at different times as 10 min, 30 min, one hr and 24 hrs before pouring. They concluded that immediate pouring made the most accurate cast (Cohen *et al.*, 1995). Jamani *et al.* (2002) investigated the best storage condition and time for pouring irreversible hydrocolloid impression material. The impressions were poured at 15 min, 30 min, one hr and three hrs after impression making. The results showed that if the irreversible hydrocolloid was poured within 15 min, it could be used as a final impression material (Jamani, 2002).

If it were safe to store the impressions for up to 30 minutes without clinically significant distortion, this would be an advantage to irreversible hydrocolloid users in the management of their practices. As we can see the data collected, clearly we can see the knowledge, awareness and practice of alginate storage among dental practitioners are quite high. (88%) Generally we can assume that most of the dental practitioners with prosthodontics background have greater awareness and knowledge on hypertension compared to other dental practitioners with different background studies. Moreover, still there is a few numbers of subjects that still do not aware on the proper condition and environment in storing the alginate. Therefore dental practitioners have to work on together in providing a good knowledge, awareness and practice of alginate storage that cannot be looked down. From the result collected, generally we can see that most of dental practitioners have great knowledge and awareness as they know the complications and significances of providing proper condition for alginate storage.

Conclusion

The study showed higher frequency of subjects who were aware about proper alginate storage (80%). However, all 50 subjects were responsive to the explanation given to them and

they understood of the causes and effects of physical and chemical properties can affect the quality of impression during its storage. Most of them tend to realize on how important is to keep a proper environment for storing the alginate impression in order to keep their quality maintained. The study presented a comprehensive overview of awareness and knowledge on alginate storage among dental practitioners in Chennai, different opinion and knowledge regarding the alginate storage was different between each and everyone. Therefore, the study conducted showed the dental practitioners exhibit positive attitude towards alginate storage environment. On the other hand, there is still a few of dental practitioners that still unaware and exhibit negative attitude towards hypertension and proper solutions should be think of in order to build a solid knowledge of alginate storage for them.

REFERENCES

- Cohen BI, Pagnillo M, Deutsch AS, Musikant BL. 1995. Dimensional accuracy of three different alginate impression materials. *J Prosthodont.*, Sep;4(3):195-9.
- Cook, W. 1986. Alginate dental impression materials: chemistry, structure, and properties. *J Biomed Mater Res.*, 20:1-24.
- Giordano 2nd, R. 2000. Impression materials: basic properties. *Gen Dent*, 48:510-512, 514, 516
- Hondrum OS, Fernandez R. 1997. Effects of long term storage on the properties of an alginate impression material. *J Pros Dent*, 77(6): 601-606.
- Imbery TA, Nehring J, Janus C, Moon PC. 2010. Accuracy and dimensional stability of extended-pour and conventional alginate impression materials. *J Am Dent Assoc.*, 141(1):32-9.
- Jamani KD. 2002. The effect of pouring time and storage condition on the accuracy of irreversible hydrocolloid impressions. *Saudi Dent J.*, 14(3):126-30.
- Jayaprakash, Kukhila, and BantarhalliThopegowdaNandish. 2014. "Impact of storage environments on the dimensional stability of irreversible hydrocolloid alginate impression used in dentistry." *International Journal of Health and Rehabilitation Sciences (IJHRS)*, 3.1 24-29.
- Jones ML, Newcombe RG, Bellis H, Bottomley J. 1990. The dimensional stability of self-disinfecting alginate impressions compared to various immersion regimes. *Angle Orthod.*, Summer;60(2):123-8.
- Nallamuthu, N., M. Braden and M. P. Patel, 2006. Dimensional changes of alginate dental impression materials. *J Mater Sci Mater Med.*, 17:1205-1210.
- Powers, J. M. and R. L. Sakaguchi. 2006. Alginate hydrocolloids. In Powers, J. M. and R. L. Sakaguchi .eds. *Craig's Restorative Dental Materials*. St Louis, Mo Mosby Elsevier.
- Sawyer HF, Sandrik JL, Neiman R. 1976. Accuracy of casts produced from alginate and hydrocolloid impression materials. *J Am Dent Assoc.*, Oct;93(4):806-8.

Questionnaire

Instruction: Please put a tick next to the answer of your choice or write in the space provided below.

Name: _____
Sex: _____
Age: _____

Hospital/Clinic/College: _____
Nationality: _____
Email (optional): _____

What is the highest level of formal education you have completed?

- a)Diploma
- b)First degree
- c)Post-graduate Diploma
- d)Masters

Which department are you?

- a)Endodontics
- b)Orthodontics and DentofacialOrthopedics
- c)Pediatric Dentistry
- d)Periodontics
- e)Prosthodontics
- f)Dental Public Health
- g)Oral and Maxillofacial Surgery
- h)Oral and Maxillofacial Radiology
- i)Oral and Maxillofacial Pathology

Do you think alginate storage is necessary in making alginate impression?

- a)Yes
- b)No
- c)Do not know

Are you aware that physical and chemical properties can affect the quality of the impression surface while in storage?

- a)Yes
- b)No
- c)Do not know

Do you know it is necessary to take care on physical and chemical properties of alginate while in storage ?

- a)Yes
- b)No
- c)Do not know.

Do you know humidity can affect the alginate impression?

- a)Yes
- b)No
- c)Do not know.

Are you aware that temperature is important in alginate storage environment?

- a)Yes
- b)No
- c)Do not know

Do you know unsuitable storage condition/environment can cause the abnormal dimensional stability of alginate impression ?

- a)Yes
- b)No
- c)Do not know.

Do you know that concentration of NaCl can affect the alginate quality in storage?

- a)Yes
- b)No
- c)Do not know

Do you know that concentration of K_2SO_4 can affect the alginate quality in storage?

- a)Yes
- b)No
- c)Do not know

Do you know shrinkage of alginate impression can happen in improper storage environment?

- a)Yes
- b)No
- c)Do not know.

Do you know more syneresis can occurs in higher concentration of NaCl and K_2SO_4 ?

- a)Yes
- b)No
- c)Do not know.

Are you an aware that dimensional stability of alginate impression can be disrupted if proper methods of alginate storage are not be followed.

- a)Yes
- b)No

Date: _____

Signature:
