



A Survey to Assess the Knowledge, Awareness and Practice About Use of Resilient Denture Liners among Dental Practitioners of Jammu Region

Dr. Reecha Gupta¹, Dr. Rakshita Chowdhary², Dr. Monica Kotwal³, Dr. Aditi Sharma⁴, Dr. Paaras Kotwal⁵ Dr. Aamir Ali⁶

Department of Prosthodontics and Crown & Bridge, Indira Gandhi Govt. Dental College, Jammu

Corresponding author: Dr. Rakshita Chowdhary*

(Received: 27 September 2025 Revised: 05 October 2025 Accepted: 01 November 2025)

KEYWORDS ABSTRACT:

Denture liners,
Resilient liners,
Silicone, Resin,
Knowledge,
Awareness,
Practice

Aim: This Questionnaire study aimed out to assess the knowledge, awareness and practice about use of Resilient denture liners among dental practitioners Jammu region.

Method: The present epidemiological study was conducted in the Postgraduate Department of Prosthodontics and Crown & Bridge, using a self-structured questionnaire survey. The sample comprised of 200 Post graduate dental students and dental practitioners on the basis of Prevalence 57% with margin error of 5% and Type 1 error (α) is 0.05 and Type 2 error (β) is 0.2 by using OpenEpi. The questionnaire form was circulated to assess their knowledge and awareness about the use of Resilient denture liners. The survey was kept open for about 5 months and the responses were collected at the same time.

The questionnaire comprised of 20 close ended questions and were based on general knowledge and awareness regarding Resilient Denture liners.

Result: The results showed that among 200 subjects who participated, 100 % were aware about the existence of resilient denture liners out of which 95 % practicing dentists would prefer silicon based liners over resin based liners. 98 % subjects were aware about the composition & properties of denture liners. 72 % subjects preferred using both type of denture liners (short & long term). 79 % subjects preferred combine technique (direct & indirect). 78 % practitioners are not using resilient denture liners in their clinical practice. Also as per findings only 21% of dental practitioners are using denture liners in their daily clinical practice.

Conclusion: Denture liners have a significant role in dentistry especially in medically compromised patients, patients having highly resorbed ridges etc. From this survey it is concluded that majority of dental practitioners have awareness about the existence of denture liners and many of them have knowledge about composition, indication, contraindication, properties, pros & cons of these materials but still there is need to spread more awareness about their use as it is seen that only few dental practitioners are using denture liners in their daily clinical practice.

Background

Edentulism is an enfeebling and irreversible condition which is described as the “ultimate sign of disease burden for oral health”. Edentulism is one of the major problems among old age people which leads to lot of problems related to mastication, speech and esthetics. Residual ridge resorption is one of the adverse effect of edentulism on the alveolar bone.¹ When comes to treatment planning, resorbed ridge is a concern. Moreover immunocompromised diseases like Diabetes mellitus which is very common now a days accelerate the bone loss and because of these diseases old people

are very prone to denture stomatitis and inflammation of oral cavity and all these problems lead to many difficulties to patient. So to overcome these problems resilient liners are introduced in the field of dentistry.¹

Resilient liners are soft and elastic materials which have depicted exceptional clinical assistance in managing patients with chronic denture soreness. These materials have also found an extensive range of applications in the field of maxillofacial prosthesis.² Several clinical trials over edentulous patients have shown that usage of denture with resilient liners results in better comfort, distinctly improved speech, abridged sensation of pain



& soreness under the denture, enhanced ability to chew, better retention & firmness, psychological comfort and extended denture wearing period.^{1,2,3}

Resilient Denture liners are classified as short term resilient liners (Tissue conditioners) and long term resilient liners. Tissue conditioners are short term liners which are used to manage denture soreness. They are used as temporary relining materials for ill-fitting dentures and immediate dentures to facilitate tissue healing without discarding the use of prosthesis and they are also used for making functional impressions. On the other hand long term liners are used to manage denture soreness & in patients with sharp & atrophied ridges, thin atrophied mucosa viewing less ability to bear load transmitted by the denture and in cases where denture exhibits poor retention causing recurrent sore spots under the denture.⁴ Based on the composition, Long term resilient liners have been categorized into two groups --- Plasticized acrylics and Silicone elastomers. Both are available in auto as well as heat-polymerized form.⁵

Short term resilient liners are tissue conditioners which are used to treat denture soreness. They are used as temporary relining materials for ill fitting dentures are immediate dentures to facilitate tissue healing without discarding the use of prosthesis and they are also used for making functional impressions. The only disadvantage of short term liners are they need to be replaced more often.⁴

Composition & Structure:

Tissue conditioners are auto-polymerised resins available as two components system - powder and liquid systems. The polymer powder generally consists of polyethyl methacrylate (PEM) without any initiator and the liquid contains an ester based plasticizer and ethyl alcohol^{6,7}. The plasticizers commonly used are large molecular size aromatic esters (except dibutyl sebacate which is an aliphatic ester) such as dibutyl phthalate, benzyl benzoate, butyl benzyl phthalate.⁸ Long term resilient liners are commercially accessible as plasticized acrylics or silicone elastomers. They can be either chemically cured (auto-polymerized) or heat cured. They both are supplied as a powder and a liquid form. The powder generally consists of poly (ethyl methacrylate) or poly (butyl methacrylate) along with

some peroxide initiator. The liquid of auto-polymerized acrylic liners contain 2- ethylhexyl methacrylate, tertiary amine and plasticizer while the liquid of heat-polymerized acrylic is a mixture of methyl methacrylate and plasticizer. Heat cured silicone elastomers are supplied as a single paste system consisting of poly-dimethyl siloxane with terminal vinyl group through which cross linking occurs and benzoyl peroxide as initiator. Chemically cured silicone elastomers are supplied in the form of a two-paste cartridge - a base paste and a liquid catalyst. The base paste comprises of polymethyl-hydrosiloxane, as well as divinylpolysiloxane. The catalyst paste comprises of divinylpolysiloxane and a platinum salt. When the two pastes are mixed together, they undergo addition polymerization to yield the elastomer.⁹

Properties, clinical implications and limitations:

The required effects of Resilient liners result from their capability to evenly allocate and absorb the functional forces during mastication because of their viscoelastic behaviour. In cases of unfavourable foundation areas (sharp/uneven/irregular alveolar ridge anatomy), the denture is not able to fit and sit firmly on the foundation. Under masticatory load, these dentures move and slope upon the foundation and thus beneath the denture, the area of support become insignificant. Subsequently, the pressure surpasses several folds greater than the average pain verge of the alveolar mucosa and the patient complains of soreness and uneasiness. Elastic deformation of the lining material beneath the denture base under masticatory load increases the contact surface beneath the denture resulting in even pressure distribution and pain reduction. Viscoelasticity is the property of a material by advantage of which it shows both elastic and viscous behaviour i.e. to say, the application of stress causes elastic deformation in it if stress is quickly removed but it causes a plastic deformation if it is sustained for a prolonged period.¹¹

Microbial colonization of the denture lining material stances a important challenge. The conditions prevailing in the oral cavity under the denture base i.e. high humidity, warm temperature, inaccessibility to self-cleansing action of action promote the growth of micro-organisms.¹⁵ Micro-organisms initially adhere to surface of the liner material and later they also invade into the



structure of the materials. The later phenomenon lessens the efficiency of conventional denture cleansers to limit their growth. All this may predispose the patient to infection and denture induced stomatitis. Bulard et al. in his study on the colonization of *Candida Albicans* and penetration of long term resilient liners noted a high degree of colonization in the region of resin denture base – silicon soft liner interface which may be attributed to the existence of micro-gap in this region due absence of durable and ineffective bond between the denture base and the silicon soft liner. This could be a potential cause for the de-bonding of silicon soft liners in the oral cavity.¹⁶

In the moist environment of the oral cavity, the resilient liners exhibit water sorption, the degree of which depends upon the hydrophilicity of the matrix and the presence of leachable plasticizers or other soluble substances. This phenomenon may appear as modification in mechanical properties of the liners (e.g. loss of viscoelastic behaviour), change in dimensions, microbial growth, discoloration, etc. It also lessens the bond strength of denture base resins by directly damaging bond site by swelling and pressure build up at the bond interface or by altering the visco-elastic properties of the lining material rendering the liner relatively stiff and less yielding, thus transmitting the external load to the bond site. Silicone elastomers are hydrophobic by virtue and they do not contain leachable plasticizers, so water sorption is significantly lower which accounts for their greater dimensional stability, better retention of elastic properties, more color stability and hence prolonged durability.¹⁷

Keeping in view, importance of Resilient Denture Liners in clinical practice, a study was done to assess the knowledge, awareness and practice about use of Resilient Denture Liners among dental practitioners of Jammu Region.

Procedure

The present epidemiological study was conducted in the Postgraduate Department of Prosthodontics and Crown & Bridge, using a self-structured questionnaire survey. The sample comprised of 200 Post graduate dental students and dental practitioners on the basis of Prevalence 57% with margin error of 5% and Type 1 error (α) is 0.05 and Type 2 error (β) is 0.2 by using

OpenEpi. The questionnaire form was circulated among post graduate students and dental practitioners to assess their knowledge and awareness. The survey was kept open for about 5 months and the responses were collected at the same time.

• INCLUSION CRITERIA:

1. Dental Postgraduate Students.
2. Dental Practitioners

• EXCLUSION CRITERIA:

1. Dental Undergraduate Students
2. Dental assistants/ hygienists
3. Postgraduate Students outside Jammu

The questionnaire comprised of 20 close ended questions and was based on general knowledge and awareness regarding Resilient Denture liners. Approval was given by Institutional Ethical committee and the statistical analysis by using IBM SPSS statistics as frequency and percentage and diagrams have been constructed with the help of Microsoft excel software.

A SURVEY TO ASSESS THE KNOWLEDGE, AWARENESS AND PRACTICE ABOUT USE OF RESILIENT DENTURE LINERS AMONG DENTAL PRACTITIONERS OF JAMMU REGION

➤ The questions in the questionnaire are as follow :

1. **You are :**
 - a. Dental practitioner
 - b. PG student
2. **How many years of service do you have?**
 - a. Upto 10 years
 - b. Upto 20 years
 - c. Over 20 years
3. **Are you aware of use of resilient liners ?**
 - a. Yes
 - b. No



4. If yes, what type of resilient liners you prefer ?

- a. Silicon based liners
- b. Natural rubber
- c. Soft acrylic based liners
- d. Others

5. Are you aware of composition of denture liners ?

- a. Yes
- b. No

6. If yes, what is the composition?

- a. Polyethyl – methacrylate
- b. Butylphthyl butylglycolate
- c. Polymethymrthacrylate
- d. Aromatic ester
- e. ethyl alcohol
- f. all of the above
- g. none of the above

7. Are you aware about the properties of resilient liners?

- a. Yes
- b. No

8. If yes , what are the properties of these liners you aware of :

- a. Flow under constant force
- b. Resilient at higher rates of deformation
- c. Remain viscous for several days
- d. Adhesion to aid retention to denture base
- e. Permanent resiliency
- f. Dimensional stability
- g. Color stability

- h. Inertness to fungus and bacteria
- i. Biocompatibility
- j. Odor , taste , toxicity
- k. All of the above
- l. Others

9. What are the indications of denture liners?

- a. Tissue treatment
- b. Baseplate stabilization
- c. Liners in surgical splints
- d. To maintain fit of denture
- e. Temporary obturator
- f. As a functional impression material
- g. Trial denture base
- h. All of the above
- i. none of the above

10. According to you, what are the contraindication of resilient liners ?

- a. Relief areas
- b. Denture opposing natural dentition
- c. Xerostomia
- d. Obturators to enhance retention
- e. All of the above
- f. None of the above

11. Are you aware about the problems associated with denture liners ?

- a. Yes
- b. No



12. If yes, what are the complications associated with them ?

Ans.....
.....
.....

13. What type of resilient denture lining material you use in your clinical practice ?

- a. Short – term (3-6 Months)
- b. Long- term (more than 6 months)
- c. Both
- d. None

14. What technique you prefer to use?

- a. Direct lining in room (chairside)
- b. Combined (both direct and indirect)
- c. Indirect lining (labortorary)

15. Do you use resilient liners in your daily clinical practice?

- a. Yes
- b. No

16. If you have used both silicon based liners and acrylic based liners , what do you think according to you are the best liners among them?

- a. Silicon based
- b. Soft acrylic based
- c. Both are same

17. In what cases do you recommend resilient denture lining materials to your patients?

- a. Severely retentive alveolar ridges
- b. Severely atrophied alveolar ridges
- c. Hard adhering dentures due to reduced salivation
- d. Presence of exostosis

e. Presence of painful neurologic points

f. In the course of implant prosthetic treatment

g. In relation to the wearing of an obturator or a maxillofacial prosthesis

h. Other clinical cases

.....
....

18. After what period of time have you replaced the resilient liners in your patients?

- a. 1-2 months
- b. 4-6 months
- c. 1 year
- d. 2 years
- e. Others

.....

f. never

19. What kind of instructions do you give to your patients for the maintenance of soft lined dentures?

a. To soak the dentures in a denture cleaning solution for a short time and wash with tooth brush and soap

b. To soak the denture in denture cleaning solution for 24 hrs

c. To wash the denture with the soft brush and soap

d. Not to use a toothbrush, just soak the dentures in denture cleaning solution for 15 – 20 mins.

e. To soak the denture in denture cleaning solution for 15-20 mins. and clean with a soft toothbrush only the area of hard resin and teeth

f. Others

.....
.....
.....



.....

20. What do you think according to your experience of using liners , are they really beneficial to patients and in clinical practice ?

- a. Yes
- b. No

Results:

1.YouareDentalpractitionerorPGstudent:		
Options	Frequency(n)	Percent(%)
Dentalpractitioner	160	80.0
PGstudent	40	20
Total	200	100.0

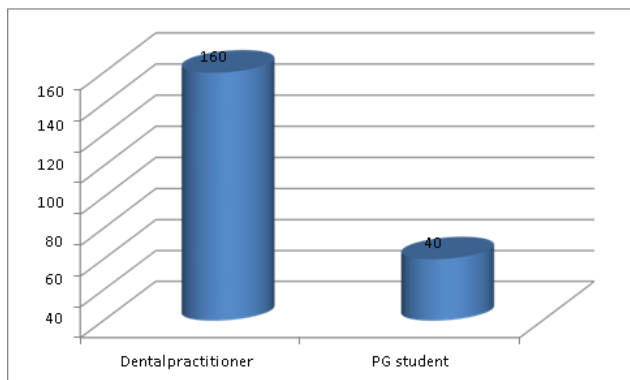


FIGURE:1

2.Howmany yearsof servicedoyou have?		
Options	Frequency(n)	Percent(%)
Blank	3	1.5
over20years	22	11.0
upto10 years	111	55.5
upto20 years	64	32.0
Total	200	100.0

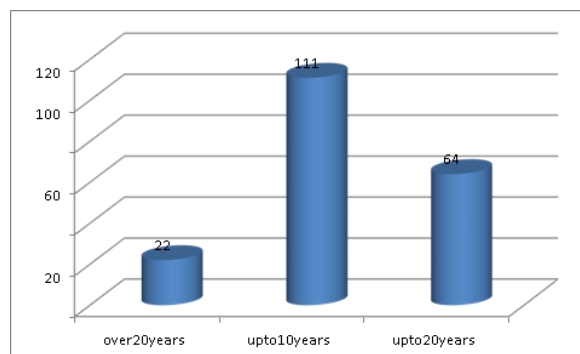


FIGURE : 2

3.Are youaware of useofresilient liners ?		
Options	Frequency(n)	Percent(%)
Yes	200	100.0
No	0	0
Total	200	100.0

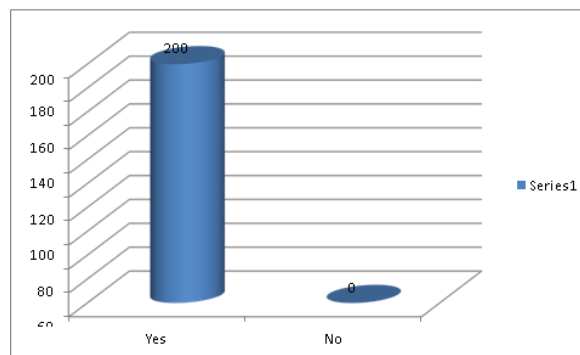


FIGURE : 3

4.If yes,what typeofresilientliners youprefer ?		
Options	Frequency(n)	Percent(%)
Siliconbasedliners	190	95.0
Softacrylicbased liners	10	5.0
Total	200	100.0

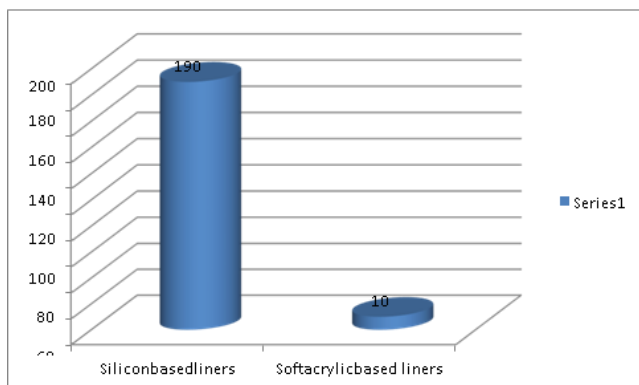


FIGURE:4

5.Are youaware of compositionofdentureliners ?

Options	Frequency(n)	Percent(%)
Blank	4	2.0
Yes	196	98.0
No	0	0
Total	200	100.0

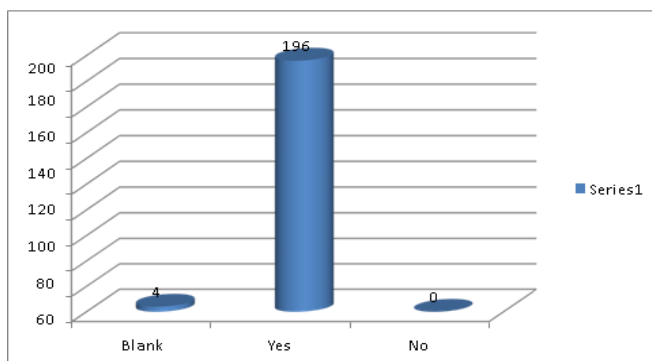


FIGURE : 5

6.Ifyes, whatisthe composition?

Options	Frequency(n)	Percent(%)
Alloftheabove	123	61.5
Pmethylmethacrylat e	1	.5
Polyethyl methacrylate	76	38.0
Total	200	100.0

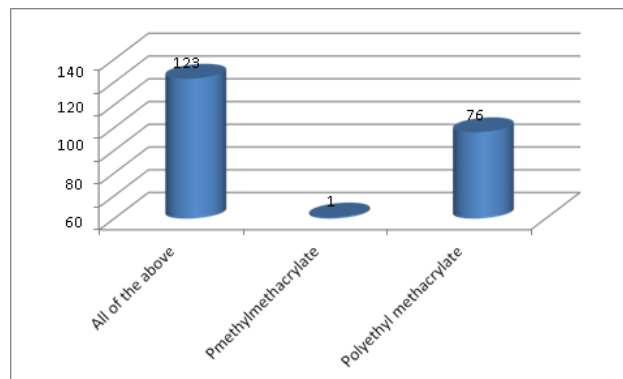


FIGURE : 6

7.Areyouawareabout thepropertiesofresilient liners?

Options	Frequency(n)	Percent(%)
Blank	4	2.0
Yes	196	98.0
No	0	0
Total	200	100.0

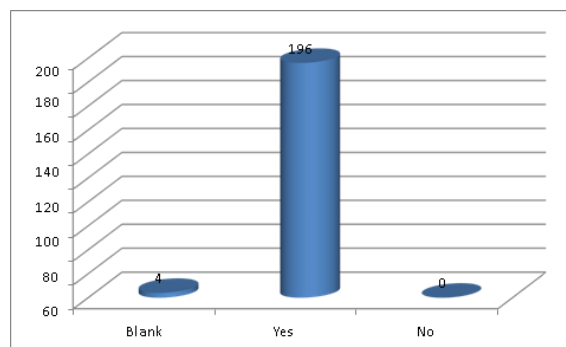


FIGURE : 7

8.Ifyes ,whatare thepropertiesof theselinersyouawareof :

Options	Frequency(n)	Percent(%)
Adhesion to aid retentiontodenture base	10	5.0
Alloftheabove	188	94.0
Flowunderconsta nt force	1	.5
Remainviscousfor several days	1	.5
Total	200	100.0

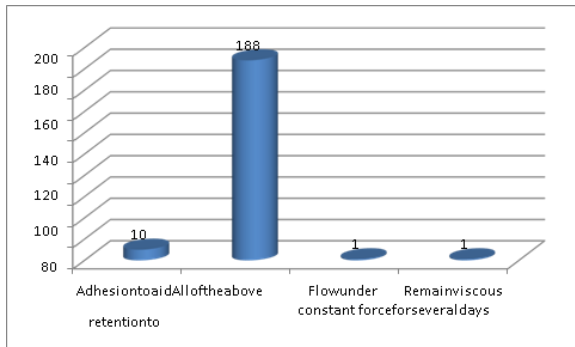


FIGURE : 8

9. What are the indications of denture liners?

Options	Frequency(n)	Percent(%)
Blank	1	0.5
All of the above	189	94.5
Baseplate stabilization	2	1.0
None of the above	1	0.5
Tissue treatment	7	3.5
Total	200	100.0

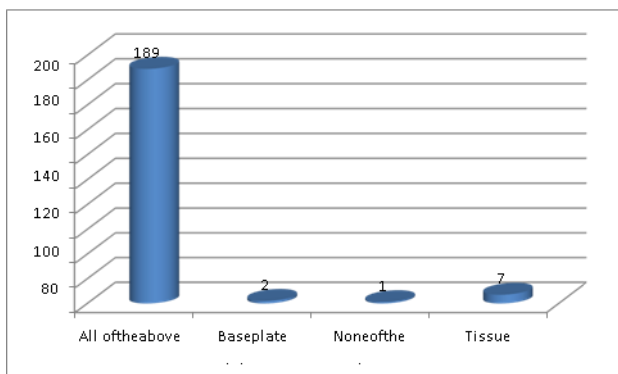


FIGURE: 9

10. According to you, what are the contraindications of resilient liners?

Options	Frequency(n)	Percent(%)
All of the above	142	71.0
None of the above	1	0.5
Obturator to enhance retention	12	6.0
Xerostomia	45	22.5
Total	200	100.0

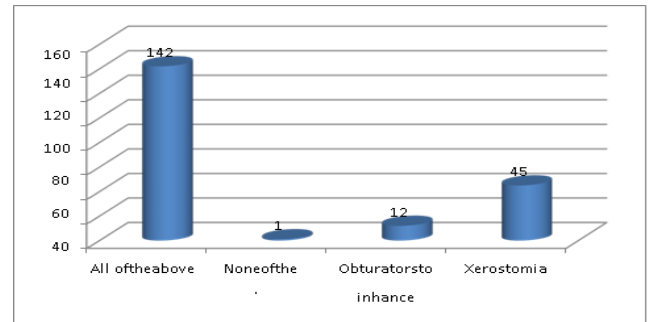


FIGURE : 10

11. Are you aware about the problems associated with denture liners?

Options	Frequency(n)	Percent(%)
Blank	1	0.5
No	19	9.5
Yes	180	90.0
Total	200	100.0

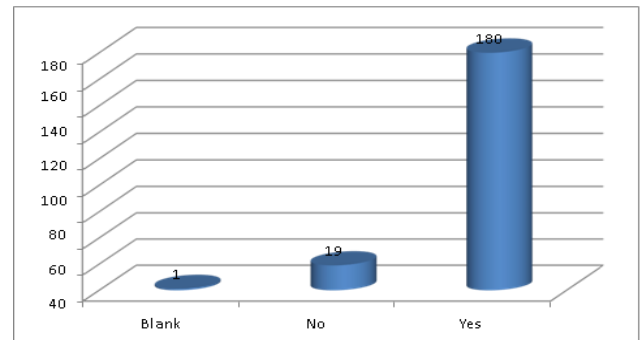


FIGURE : 11

12. If yes, what are the complications associated with them?

Options	Frequency (n)	Percent(%)
BACTERIAL AND FUNGAL GROWTH	10	5.0
BACTERIAL AND FUNGAL GROWTH	1	0.5
BACTERIAL AND FUNGAL GROWTH	117	58.5
BACTERIAL AND FUNGAL GROWTH, FOUL SMELL	1	0.5
BACTERIAL AND FUNGAL	1	0.5



GROWTH,LOSS OFTEXTURE		
BACTERIALAND GUNGAL GROWTH	2	1.0
BACTERIALANF FUNGAL GROWTH	1	.5
FUNGALAND BACTERIAL GROWTH	9	4.5
FUNGAL AND BACTERIAL GROWTH , FOUL SMELL,LOSSOF TEXTURE	1	.5
FUNGAL GROWTH	42	21.0
FUNGAL GROWTH, POROSITY	1	.5
GROWTH OF MICROORGANISM S	1	.5
LOSS OF RESILIENCY, COLOR INSTABILITY FUNGAL GROWTH	1	.5
LOSS OF TEXTURE, FUNGAL GROWTH	1	.5
NO	10	5
POROSITY , FUNGAL GROWTH,FOUL SMELL	1	.5
Total	200	100.0

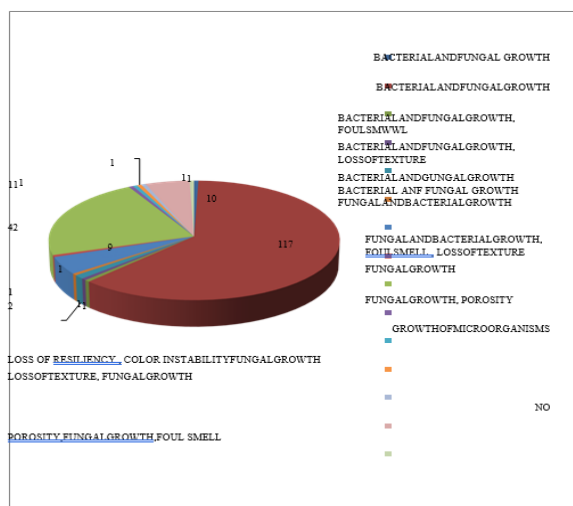


FIGURE : 12

13. Whattypofresilientdentureliningmaterialyouse in your clinical practice ?

Options	Frequency(n)	Percent(%)
Both	144	72.0
Long-term(more than 6 months)	27	13.5
None	3	1.5
Short-term(3-6 months)	26	13.0
Total	200	100.0

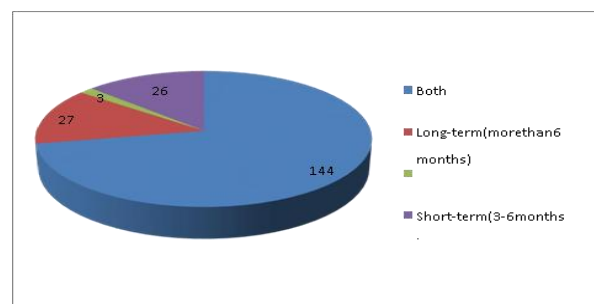


FIGURE : 13

14. What techniqueyou prefertouse?

Options	Frequency(n)	Percent(%)
Combined (both directandindirect)	158	79.0
Direct lining in room(chairside)	36	18.0
Indirectlining(laboratory)	6	3.0
Total	200	100.0

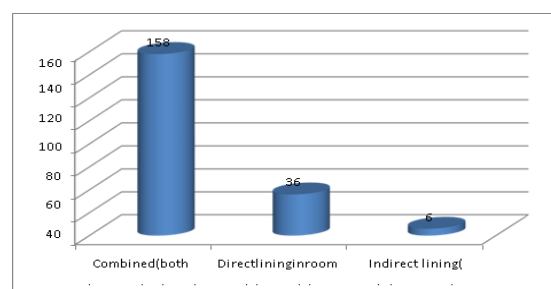


FIGURE : 14



15. Do you use resilient liners in your daily clinical practice?		
Options	Frequency(n)	Percent(%)
Blank	1	.5
No	156	78.0
Yes	43	21.5
Total	200	100.0

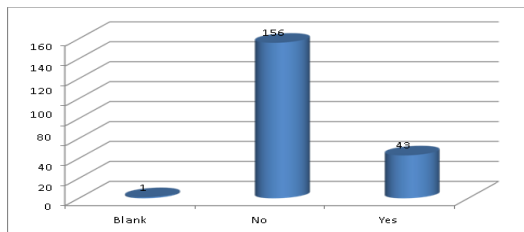


FIGURE : 15

16. If you have used both silicon based liners and acrylic based liners, what do you think according to you are the best liners among them?

Options	Frequency(n)	Percent(%)
Blank	1	.5
both are same	14	7.0
Silicon based	184	92.0
Soft acrylic based	1	.5
Total	200	100.0

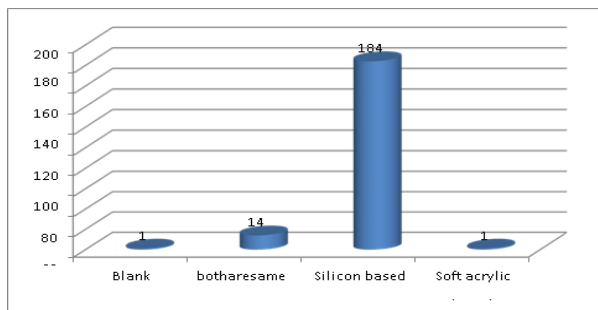


FIGURE : 16

17. In what cases do you recommend resilient denture lining materials to your patients?

Options	Frequency(n)	Percent(%)
Hard adhering dentures due to reduced saliva	14	7.0

Presence of painful neurologic points	3	1.5
Severely atrophied alveolar ridges	182	91.0
Severely retentive alveolar ridges	1	.5
Total	200	100.0

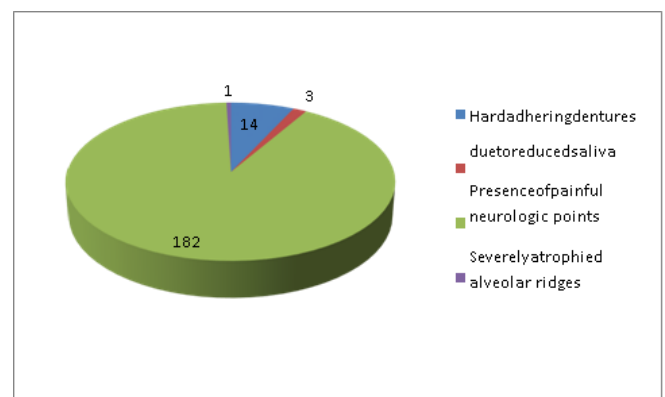


FIGURE : 17

18. After what period of time have you replaced the resilient liners in your patients?

Options	Frequency(n)	Percent(%)
1 year	122	61.0
1-2 months	6	3.0
2 years	1	.5
4-6 months	66	33.0
Never	5	2.5
Total	200	100.0

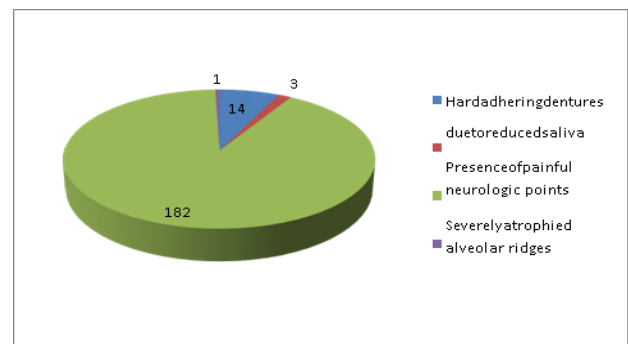


FIGURE : 18



19. What kind of instructions do you give to your patients for the maintenance of soft lined dentures?

Options	Frequency(n)	Percent(%)
Not to use a toothbrush , just soak the dentures in denture cleaning solution for 15 - 20 mins	1	.5
To soak the denture in denture cleaning solution for 15 - 20 mins and clean with a soft toothbrush only the area of hard resin and teeth	132	66.0
To soak the dentures in a denture cleaning solution for a short time and wash with toothbrush and soap	66	33.0
To wash the denture with soft brush and soap	1	.5
Total	200	100.0

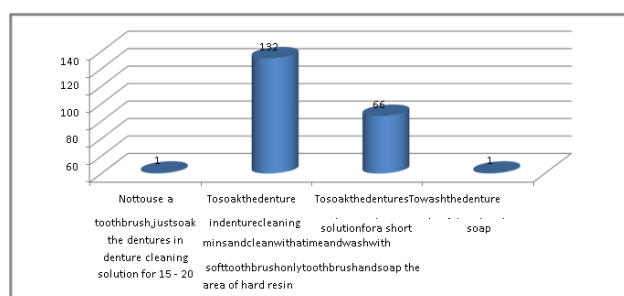


FIGURE : 19

20. What do you think according to your experience of using liners , are they really beneficial to patients and in clinical practice ?

Options	Frequency(n)	Percent(%)
Yes	200	100.0
No	0	0
Total	200	100.0

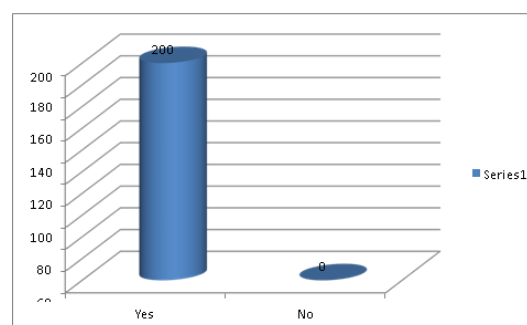


FIGURE : 20

Discussion:

A resilient lining material may be defined as an elastic or a viscoelastic material applied to the fitting surface of the denture for the purpose of reducing and for more evenly distributing occlusal loads on the underlying oral tissues. It reduces the masticatory forces transmitted by prosthesis to the underlying tissues. Resilient liners also acts as a shock absorbent. Thus use of resilient liners play an important role in dentistry.²² So in order to know that how much dental practitioners are aware about these material, a study was conducted to assess the knowledge , awareness and practice of resilient denture liners among dental practitioners of Jammu Region.

This study describes knowledge , awareness and practice of resilient denture liners among dental practitioners of Jammu Region . Findings from this study indicated that how many dental practitioners are aware about these materials and their properties and how many of them are using these material in their clinical practice. The results in this study , a total of 200 subjects were taken into consideration and the following information was obtained.

Among 200 subjects who responded 80% were dental practitioners and 20 % were Postgraduate students from Jammu Region. (Graph 1)

Among them 55 % were in service upto 10 years , 32% were in service upto 20 years and 11% of them were in service for over 20 years which shows that the newer dental practitioners know more about the resilient liners. Although each responder was aware about the existence of the material but in practice 55 % who were practicing for 10 years 0r less were using it. (Graph 2).



Among all the responders, each responder was aware about the existence of Resilient Denture Liners i.e. 100% of them respond yes.(Graph 3). 100 % response signifies that there is awareness about this material among Dental practitioners.

When questioned about their preference about the type of resilient liner, 95% of them would prefer silicon based liners and only 5% of them would prefer resin based liners (Graph 4). This response showed that the 5% of the dentist who would prefer resin based liners were mostly old practitioners who were there in clinical practice for over 20 years, which reflects that silicon based liners are more popular for last 10 years or so and may have better properties than resin based liners.

Regarding composition of resilient denture liners, 98% subjects were aware about the composition of these material. (Graph 5) and upon questioning about the composition, 61.5% were aware of all the components i.e. Polyethyl – methacrylate, Butylphthyl butylglycolate, Polymethmethacrylate, Aromatic ester, ethyl alcohol. 38% of them responded only polyethy-methacrylate as a composition of denture liners and 0.5% responded polymethmethacrylate as a composition of denture liners. The actual composition of denture liners are all of the mentioned components in different proportions so, this answer indicates that most of the doctors who are using the liners are aware about the whole composition of denture liners. The main constituent of soft liners is polyethy-methacrylate, and most of the responders were aware about this constituent.⁸ (Graph 6)

Regarding the properties of denture liners, 98% subjects responded yes, that they were aware about the properties of these materials. (Graph 7), When questioned about their properties, 94% were aware of all of the properties i.e. : Flow under constant force, Resilient at higher rates of deformation, Remain viscous for several days, Adhesion to aid retention to denture base, Permanent resiliency, Dimensional stability, Color stability, Inertness to fungus and bacteria, Biocompatibility, Odor, taste and toxicity, which was very satisfying that most of the dental practitioners have knowledge about all the properties of resilient liners. 5% of them were only aware about their adhesion property, 0.5% were aware only about their flowing

property and 0.5% were only aware about their viscous property.¹² (Graph 8). Resilient liners have viscoelastic properties, they distribute and absorb the functional forces during mastication by means of viscoelastic behavior. One of the important property of denture liners is that they have no natural adhesion to denture base, they depend on an adhesive or bonding agent for adherence of lining to the denture base. Dimensional stability is an important physical property to ensure that denture can maintain its shape over a period of time. Shrinkage can occur during polymerization and cooling, whereas expansion can occur when exposed to an increase temperature.¹³

The subjects were questioned about the indications of using denture liners, 94.5% subject answered all of the above i.e. the following were the indication of these material: Tissue treatment, Baseplate stabilization, Liners in surgical splints, To maintain fit of denture, Temporary obturator, As a functional impression material, Trial denture base. In general these all are the indications of these material but some percentage of subjects were not aware of all the indications, 3.5% of subjects know only that these material are used for tissue treatment, 1% subjects know that they are indicated for baseplate stabilization, only 1% of the dental practitioners were unaware of when and where to use the denture liners.⁵ (Graph 9).

There are some contraindications of denture liners, one should know about the contraindication of these materials before using them in their clinics, so regarding the contraindications, 71% of subjects were aware of the contraindications. Relief areas, Denture opposing natural dentition, Xerostomia, Obturators to enhance retention are the common contraindications of these materials. 22.5% answered xerostomia only and 12% answered obturators to aid retention as its contraindication. 1% subjects were unaware about their contraindications at all. (Graph 10)

Denture liners have an inherent property of: fungal and bacterial growth on their surface which will lead to local infections and foul smell. Another problem with denture liners is loss of texture with time. When questioned about this, 90% of dental practitioners answered that they were aware about the problems associated with them, when questioned that what are the problems, 89 % answered about bacterial and



fungal growth , only 1% of practitioners also know about loss of texture of denture liners. 10% subjects were unaware of their problems . Although the most important and common problem with resilient liners is the fungal and bacterial growth, about which 90% of responders are aware. Knowing about this problem is important for dentist so that if they are using these resilient soft liners on their patients they can tell them about this problem and hence making them more aware about the cleanliness of their prosthesis in order to prevent fungal growth and hence reducing infections. Patients also need to be aware about the recall visits.²⁰ (Graph 11 and 12)

Participants were questioned about what type of resilient denture liners they would use in their clinic practice , 13.5 % preferred using long term denture liners , 13% preferred using short term denture liners and 72% preferred using both types of denture liners. (Graph 13). There are two types of denture liners : long term and short term denture liners . Long term resilient liners which are used to prevent denture soreness and are recommended as a preventive measure in edentulous patients with sharp and atrophied alveolar ridges, patients with thin atrophied mucosa exhibiting low tolerance to load transmitted by the prosthesis, patients who experience pain at nerve ending locations and in cases where denture exhibits poor retention causing recurrent sore spots under the denture . Short term resilient liners are tissue conditioners which are used to treat denture soreness. They are used as temporary relining materials for ill fitting dentures or immediate dentures to facilitate tissue healing without discarding the use of prosthesis and they are also used for making functional impressions. The only disadvantage of short term liners are they need to be replaced more often.⁶ When asked about what type of resilient denture liners they would use in their clinic practice , 13.5 % preferred using long term denture liners , 13% preferred using short term denture liners and 72% preferred using both types of denture liners. (Graph 13).

There are different techniques used for denture liners . these techniques are : Direct lining in room (chairside) , Indirect lining (laboratory), Combined (both direct and indirect). 18% subjects preferred direct lining technique , 3% subjects preferred indirect lining technique and 79% subjects preferred combined technique. (Graph 14)

The participants were questioned , do they use resilient liners in their daily clinical practice , 78% answered no and only 21.5 % answered yes, which implies that subjects are aware about the resilient liners but when it comes to their routine use in clinics they are not using it . This is probably due to high cost of resilient liners and patients were not willing to pay high cost or may be they are not very confident about their usage or they may be concerned about their short span.¹⁰ So it is important to make people more aware about these materials , their use and benefits to them.(Graph 15)

Regarding which type of resilient liner is best , Subjects were questioned, If they have used both silicon based liners and acrylic based liners , what do they think according to them are the best liners , 92% subjects answered silicon based liners are better than resin based liners , 0.5 answered acrylic based are better and 7% answered both are same. (Graph 16). Both type of liners have their own advantages and disadvantages. Silicon based liners have better properties than acrylic based liners as acrylic based liners quickly deteriorate their properties. They tend to absorb water and change their composition. But on the other hand silicon based liners also have disadvantage that they harbor the fungal and bacterial growth .^{20,21} Advantage of Silicon based liners are that they have better durability and they act as a cushion and provide an even distribution of functional load onto stress bearing mucosa.

Participants were questioned : In what cases do they recommend resilient denture lining materials to their patients, 91% subjects answered in case of severely atrophied ridges , 1.5% answered in presence of painful neurologic points, 7% answered in case of hard adhering denture due to reduced saliva. (Graph 17)

It is recommended that resilient liners should be replaced after some period of time. So regarding this , the question was asked :After what period of time have they replaced the resilient liners in their patients, 61% answered after 1 year , 33% answered after 4-6 months , 3% answered after 1-2 months. (Graph 18). The time period of replacing the resilient liners is different depending upon what type of soft liner the clinician is using i.e. short term or long term liners. For short term it is recommended to replace it after 3-4 months and for long term it should be replaced after 1 year but patient should be kept on regular recall visits.^{6,16}



Maintenance of soft lined dentures is very important for the oral hygiene of the patients, so instruction should be given by dentist to their patients that how it should be maintained. The question is asked regarding this , 66% answered, To soak the denture in denture cleaning solution for 15 - 20 mins and clean with a soft toothbrush only the area of hard resin and teeth , 33% answered, to soak the dentures in a denture cleaning solution for a short time and wash with tooth brush and soap. (Graph19).

Subjects were questioned:What do they think according to their experience of using liners , are they really beneficial to patients and in clinical practice, 100% of them said yes they are beneficial. (Graph 20)

The study revealed that Dental practitioners are aware about resilient soft liners, their use , composition , indication , contraindications , advantages and disadvantages. However inspite of knowing all the benefits of using resilient liners , only certain percent of dental practitioners have incorporated it in their clinical practice.

It was noticed that its usage has increased among the doctors who are in practice for last 10 years, the reason can be the growing requirement of its usage owing to increased cases of residual ridge resorption or more resorption related underlying medical problems like diabetes , osteoporosis etc.

Conclusion

The findings of my research demonstrate that Dental Practitioners and Post graduate students have a sufficient understanding of resilient denture liners, specially about the composition, properties, indications , contraindications , advantages and disadvantages of these material but still there is need to educate dental practitioners and post graduate students about the benefits and need of these materials in their dental clinics . As per the results of the study, there are very less dental practitioners who are using these materials in their clinics. This is possibly due to lack of knowledge about the need of resilient denture liners and may be due to their expensive cost. Taking this into consideration there is need to educate about these materials , for this there is need to educate them more about the clinical use of these material as there are many diseases causing residual ridge resorption like

diabetis mellitus , osteoporosis and other immunocompromised diseases. Educating the dentists about these diseases and how they are affecting alveolar ridge and hence compromising the denture retention and how these resilient liners will be beneficial to these patients. Dentist should also be up skill about the problems associated with these materials i.e. fungal and bacterial growth on their surfaces so that they can educate their patients about this and hence making them more aware about the cleanliness of their prosthesis in order to prevent fungal growth and hence reducing infections. This will help to upgrade the standards of dental treatment. Patients should also be educated about option of relining , the use of resilient liners, and their benefits to avoid frequent refabrication of dentures.

References:

1. Dr. Shraddha Rathi , Dr. Ankit Verma , Resilient liners in prosthetic dentistry : An update, International Journal of Applied Dental Sciences,2018; 4(3)
2. Pisani MX, Malheiros-Segundo Ade L, Balbino KL, de Souza RF, Paranhos Hde F, da Silva CH. Oral health related quality of life of edentulous patients after denture relining with a silicone-based soft liner. Gerodontology. 2012; 29(2):474-80.
3. Kimoto S, Kimoto K, Gunji A, Kawai Y, Murakami H, Tanaka K. et al. Effects of resilient denture liner in mandibular complete denture on the satisfaction ratings of patients at the first appointment following denture delivery. Nihon Hotetsu Shika Gakkai Zasshi. 2008; 52(2):160-6.
4. Kimoto S, Kimoto K, Gunji A, Kawai Y, Murakami H, Tanaka K, et al. Clinical effects of acrylic resilient denture liners applied to mandibular complete dentures on the alveolar ridge. J Oral Rehabil. 2007; 34(11):862-9.
5. Mack PJ. Denture soft lining materials: clinical indications. Aust Dent J. 1989; 34(5):454-8
6. Chladek G, Żmudzki J, Kasperski J. Long-Term Soft Denture Lining Materials.Materials (Basel). 2014; 7(8):5816-5842.



7. Jones DW, Hall GC, Sutow EJ, Langman MF, Robertson KN. Chemical and molecular weight analyses of prosthodontic soft polymers. *J Dent Res.* 1991; 70(5):874-9.
8. Braden M. Tissue conditioners I Composition and structure. *J Dent Res.* 1970; 49(1):145-8.
9. Jones DW, Sutow EJ, Hall GC, Tobin WM, Graham BS. Dental soft polymers: plasticizer composite and leachability. *Dent Mater.* 1988; 4(1):1-7.
10. Rawls HR. Prosthetic polymers and resins In Phillips' Science of Dental Materials. Anusavice KJ, Shen C, Rawls HR. First South Asia Edition. Reed Elsevier India Private Limited. 524-5.
11. Diwan RR. Materials prescribed in management of edentulous patients In Prosthodontic Treatment for edentulous patients. Zarb GA, Bolender CL. Twelfth edition, Mosby, 199-200.
12. Murata H, Hamada T, Sadamori S. Relationship between viscoelastic properties of soft denture liners and clinical efficacy. *Japanese Dental Science Review*, 2008; 44: 128-132.
13. McCabe JF. A polyvinylsiloxane denture soft lining material. *J Dent.* 1998; 26(5-6):521-6.
14. Murata, H, Taguchi N, Hamada T, McCabe JF. Dynamic viscoelastic properties and the age changes of long-term soft denture liners. *Biomaterials* 2000; 21:1421-1427.
15. Murata H, Taguchi N, Hamada T, Kawamura M, McCabe JF. Dynamic viscoelasticity of soft liners and masticatory function. *J Dent Res.* 2002; 81:123-8.
16. Sarac D, Sarac YS, Basoglu T, Yapici O, Yuzbasioglu E. The evaluation of microleakage and bond strength of a silicone-based resilient liner following denture base surface pretreatment. *J Prosthet Dent.* 2006; 95(2):143-51.
17. Anil N, Hekimoglu C, Büyükbas N, Ercan MT. Microleakage study of various soft denture liners by autoradiography: effect of accelerated aging. *J Prosthet Dent.* 2000; 84(4):394-9.
18. Saraç YS, Başoğlu T, Ceylan GK, Saraç D, Yapici O. Effect of denture base surface pretreatment on microleakage of a silicone-based resilient liner. *J Prosthet Dent.* 2004; 92(3):283-7.
19. Sarac D, Sarac YS, Basoglu T, Yapici O, Yuzbasioglu E. The evaluation of microleakage and bond strength of a silicone-based resilient liner following denture base surface pretreatment. *J Prosthet Dent.* 2006; 95(2):143-51.
20. Tari BF, Nalbant D, Dogruman Al F, Kustimur S. Surface roughness and adherence of *Candida albicans* on soft lining materials as influenced by accelerated aging. *J Contemp Dent Pract.* 2007; 8(5):18-25.
21. Taylor RL, Bulad K, Verran J, McCord JF. Colonization and deterioration of soft denture lining materials in vivo. *Eur J Prosthodont Restor Dent.* 2008; 16(2):50-5
22. Harshinee Chandrasekhar, Dr. Dhanraj, Knowledge, Attitude And Practice Regarding The Use Of Resilient Liners Among Dental Practitioners In Chennai, *international Journal of Innovative Science, Engineering & Technology*, Vol. 4 Issue 3, March 2017