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“Development And Assessment Of Hibiscus Herbal Soaps”

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Abstract:

Herbal soaps, formulated with natural ingredients and medicinal plant extracts, offer a promising avenue for skin care. This study aimed to assess the awareness and preferences of respondents regarding herbal soaps in Ayodhya district, Uttar Pradesh. A total of 120 respondents, comprising 60 males and 60 females, were purposively selected for the study. The methodology involved the preparation of herbal soaps using hibiscus extract and assessing their qualities based on respondent feedback.

Results revealed that herbal soap was the most preferred option among respondents, followed by medicated and homeopathic soaps. Awareness about herbal soaps primarily stemmed from advertisements and personal networks. Preferences for essential oils in soap varied, with coconut, almond, and neem oils being the top choices. The assessment of hibiscus soap formulations indicated varying levels of satisfaction, with most respondents favoring samples with excellent medicinal benefits and moisturizing properties.

Overall, the study underscores the popularity and potential of herbal soaps in providing effective and natural skin care solutions, driven by consumer awareness and preferences. These findings contribute to understanding consumer behavior and preferences in the herbal soap market, guiding future product development and marketing strategies.

Introduction

Medicinal soaps distinguish themselves from standard varieties by incorporating synthetic or natural bioactive substances into the base soap, enhancing the final product with a broad spectrum of biological activities. Although the skin offers a degree of defense against the sun, pollution, and viruses, it remains the body's most susceptible area. Skin disorders such as eczema, warts, acne, rashes, psoriasis, and allergies are prevalent. Effective hand hygiene plays a crucial role in preventing the spread of infectious diseases by safeguarding the skin from microbial infections. This herbal soap or solution enhances the prevention of contagious illness transmission within healthcare environments (**G.Sucharita, 2020**). A natural soap can generally be categorized by its production method, which includes melt-and-pour, hot process, and cold process techniques. The hot process soap is often referred to as transparent or translucent soap. This type of soap is known for its effective cleansing properties, moisturizing effects, long-lasting fragrance, and reduced irritancy. Herbal soaps are created by incorporating various dried herbs, flowers, and stems into a soap base. Herbs, renowned for their medicinal value, affordability, and availability (**Solanki, 2011 & Saikia, 2006**) are utilized in soap formulations due to their effectiveness in treating various diseases and skin issues. Key attributes of herbal soaps include their gentle nature on the skin, ability to produce rich lather, protection against skin disorders like rashes and eczema, treatment of skin infections such as ringworm, and promotion of even skin tone and smoothness (**Getradeghana, 2000**).

Naturally occurring herbs and substances that are better for the skin and less likely to harm it are used to make herbal soaps. According to data from the **World Health Organization**, 80% of people worldwide receive their primary care from traditional medicine. In order to provide the finest skin care, some producers of natural soaps additionally employ aromatherapy and herbal remedies. Herbal soap does not include any of the artificial flavors, colors, fluorides, or other ingredients that are commonly present in conventional soap, according to **Majumdar et al. (2023)**. Herbal soap is a type of medicinal soap that primarily uses plant parts—leaves, stems, roots, and fruits—as an agent to promote health. Herbal soap is a kind of soap manufactured with natural ingredients sourced from a variety of herbs and plants, according to **Majumdar et al. (2023)**. Herbal soap is frequently made with herbs including chamomile, lavender, mint, and rosemary. These herbs have a wealth of vitamins, minerals, and essential oils that are medicinal for the skin. People with sensitive or dry skin often choose herbal soap because of its well-known calming, revitalizing, and healing qualities.

Objectives:

1. To study the awareness of respondents regarding available herbal soaps in the market.
2. To assess the developed herbal soaps by the selected respondent in Ayodhya district.

Review of literature:

The current study focused on the research theme titled "**Development and Evaluation of Herbal Soaps Incorporating Specific Medicinal Plant Extracts.**" Researchers worldwide have conducted investigations on herbal soap formulations using diverse natural herbs and varying conditions, both domestically and internationally.

Tunjungsari et al. (2022) reported that the detergent is an ingredient used to maintain cleanliness. In the manufacture of detergents, an active ingredient in the form of LAS (Linear Alkylbenzene Sulfonate) surfactant is often added to kill bacteria. One of the natural ingredients with antibacterial activity is hibiscus leaves (*Hibiscus tiliaceus* L). The use of hibiscus leaf extract as a substitute for LAS surfactants aims to reduce the impact of environmental pollution. The research method used is experimental research that produces qualitative and quantitative data. Qualitative data include phytochemical tests, organoleptic tests, hard water emulsion stability tests and cleaning power tests and quantitative data includes the characteristics of the liquid detergent produced based on testing pH, specific gravity, antimicrobial test, phenol coefficient and levels of active substances. Based on the study, results showed that hibiscus leaf extract contained secondary metabolites in the form of saponins, triterpenoid/steroidal saponins, flavonoids, and polyphenols. The antibacterial test showed that hibiscus leaf liquid detergent had antibacterial activity 1.67 times more effective than phenol.

Pancholi et al. (2023) reported that the *Hibiscus rosa-scinensis* (Fam. Malvaceae) used for various purposes which include making of drugs, cosmetics and herbal products. The formulation of herbal products such as soaps (Neem soap and Hibiscus soap) and medicated oil was prepared by using combination of some described medicinal plants which herbal benefits. Their antimicrobial and other bio-efficacies such as impact on the skin and hair growth along with physico-chemical characteristics were evaluated. On the basis of physiochemical evaluations and biological experiments the herbal formulations are proved effective and acceptable for public domain.

Adigun et al. (2019) reported that the antioxidants are important bio-regulators and suppressors of oxidation and are useful in enhancing the shelf life of consumer products. Formulated natural herbal soaps contain ingredients with antioxidant activities, but it is unknown how this influences shelf life. Herein, we evaluated whether natural additives or wild berry extracts were effective in improving the quality of natural herbal soaps. Three natural soaps, base bar (BB), forest grove (FG), and hibiscus rosehip (HR), were formulated using several wild berry extracts or natural additives and evaluated against similar commercial brands. The results indicate that natural antioxidants from some Newfoundland wild berries have applications in improving the shelf life of natural herbal soaps, but care must be taken with the choice of berry used in the final soap formulation.

Wijana et al. (2019) reported that the essential oils can be used as alternative natural substances and a transparent agent such as peppermint and lavender oil. Furthermore, peppermint and lavender oil have an antibacterial activity which is beneficial for skin health. Therefore, this study aimed to determine the optimum formula mainly the solubilizer of essential oil to produce transparent soap using natural substances with antibacterial activity, especially *S. aureus* growth. The solubilizers used included ethanol, glycerin, and liquid sugar. The studied responses included transparency, viscosity, pH, and total fatty acids. A Simplex Lattice Design (SLD) method which consisted of 13 formulas was carried out to determine the optimum soap characteristics namely organoleptic, free alkali, specific gravity, foam power, and antibacterial activity. The results showed that the optimum solubilizer formula was 20% liquid sugar, 18% ethanol, and 18% glycerin. The average of transparency, viscosity, pH, and total fatty acids responses were 98,3%, 553,33 cP, 10,04 and

19,85%, respectively. The characteristics of soap were free alkali $0,12 \pm 0,015\%$, specific gravity $1,161 \text{ g/ml}$, foam power $1,05 \pm 0,050 \text{ cm}$, and growth inhibition zone of *S. aureus* $10,17 \pm 2,753 \text{ mm}$.

Ameh et al. (2013) found that the Neem oil and Shea butter oil were mixed in various proportions and used in preparing soaps which were subsequently characterized. The combination of Neem oil to Shea butter oil considered were 100:0, 80:20, 60:40, 50:50, 40:60, 20:80 and 0:100 (wt : wt). The physical properties of the prepared soap including hardness, foamability and pH were analyzed. The antibacterial properties of the prepared soaps in terms of sensitivity, minimum inhibitory concentration and minimum bactericidal concentration (with respect to *Staphylococcus aureus* and *Bacillus subtilis*) indicated that the optimal antibacterial property of the developed soap was obtained with the exclusive use of Shea butter oil.

Majumdar et al. (2023) found that the natural components found in herbal soap possess antibacterial, antifungal, and anti-inflammatory properties, which make them effective in addressing various skin conditions like acne, eczema, and psoriasis. Herbal soap comes in a variety of scents and formulations, making it easy to find one that suits your individual needs. Some of the most commonly used herbs in herbal soap include lavender, chamomile, peppermint, rosemary, lemongrass, hibiscus tea tree, calendula, oatmeal, aloe Vera, clove, Neem, turmeric, sage, and comfrey. Every herb possesses unique properties which is beneficial for the skin and overall health. With the growing concern over synthetic and chemical-laden products, herbal soap is gaining more popularity as a safe and eco-friendly option for personal care.

Methodology:

- 1. Locale of sample:** The present study will be carried out in Ayodhya districts of State Uttar Pradesh because. The area of study is selected on the basis of availability of respondents and reach.
- 2. Selection of Sample Size:** The total sample size of **120** will be selected by purposive for the present study. 60 respondents are male and 60 are female selected for study.
- 3. Variables for standardization of soap:** Soap base, herbal extract, Vitamin E, colour, fragrance agent, and oil will be the variables used in the soap producing process, with the soap base, herbal extract, and oil being optimized and the other factors remaining constant. The variable will be finalized based on statistical data analysis and soap assessment. The soap will be developed utilizing an optimized process.

4. Selection of medicinal plants:

- Hibiscus

5. Preparation of herbal extract: Collect fresh leaves of hibiscus plant. Extract the hibiscus juice from leaves using mixer or mortar and pestle.

S.No	Ingredient for soap	Amount		
		Sample A	Sample B	Sample C
1.	Soap base (in gm).	150gm	100gm	75gm
		75ml	50ml	25ml
2.	Plant extract (in ml).	75ml	50ml	25ml
3.	Oil (in ml)	2.5ml	2ml	1.5ml

6. Optimization & Preparation of herbal soap.

Preparation of soap:

- **Method:** Melt the soap base using gas stove or any medium mix the extracted juice ten to fifteen minutes. With the soap base evenly and add desired colour and essential oil for better appearance and fragrance. After mixing all the materials, pour the mixture into mould for setting. Demould the soap after proper setting.

7. Assessment of Prepared herbal soap. The assessment of developed soap will be done by the selected respondents.

8. Product Development using best selected method .

- The final product will be developed using the best optimal approach, and the product will be priced using the standard way.

Statistical Analysis of data: The data will be tabulated and analyzed with the help of descriptive (frequency, percentage).

Result and Discussion:**Distribution of respondents according to type of soap they prefer (N=120):**

The data present in table shows that majority 39.1% of respondents prefer herbal soap, out of which 36.6% girls and 41.6% boys followed by 37.5% of respondents prefer medicated soap, out of which 40% girls and 35% boys. Homeopathic soap is preferred by 14.1% of respondents, with a slightly higher preference among girls (16.6%) compared to boys (11.6%). Only 11.6% boys prefer other types of soap. Overall, the data highlighting herbal soap as the most favored option, followed by medicated and homeopathic soap.

Soap preference	Girls	Boys	Total
	f (%)	f (%)	f (%)
Herbal	22 (36.6%)	25 (41.6%)	47 (39.1%)
Medicated	24 (40%)	21 (35%)	45 (37.5%)
Homeopathic	10 (16.6%)	7 (11.6%)	17 (14.1%)
Other		7 (11.6%)	7 (9.1%)

Distribution of respondents according to source of awareness of herbal soap:

The data from Table illustrates that the more than fifty percent (56.6%) respondents are aware about herbal soap through advertisement followed by 40.8% through family and friends and only 2.5% are through recommendations by users. Overall, the data underscores that awareness of herbal soap is prevalent among both girls and boys, primarily through advertisements and personal networks.

Awareness of herbal soap	Girls	Boys	Total
	f (%)	f (%)	f (%)
Advertisement	34 (56.6%)	34 (56.6%)	68 (56.6%)
Family & friends	24 (40%)	25 (41.6%)	49 (40.8%)
Others (recommendations by users)	2 (3.3%)	1 (1.6%)	3 (2.5%)

Distribution of respondents according to their preference of essential oil in soap:

The data present in table 4.9 illustrates that the preference for essential oils in soap among girls and boys. Overall, 23.3% of the total respondents prefer coconut oil, followed by 13.3% prefer olive oil and 18.3% prefer neem oil because neem has anti-bacterial properties and 25.8% prefer almond oil. While **Selvamani et al (2022)** in his study studied that the neem oil has anti-bacterial properties and added 1.5 ml neem oil in soap making and Almond oil has antioxidant. only 6.6% prefer tea tree oil followed by 12.5% prefer other options like rosemary and lavender respectively. This suggests varied preferences among respondents regarding the type of essential oil they prefer in their soap formulations.

Preference of essential oil in soap	Girls	Boys	Total
	f (%)	f (%)	f (%)
Coconut	14 (23.3%)	14 (23.3%)	28 (23.3%)
Neem	8 (13.3%)	14 (23.3%)	22 (18.3%)
Tea tree	3 (5%)	5 (8.3%)	8 (6.6%)
Other (rosemary, lavender)	6 (10%)	9 (15%)	15 (12.5%)

Distribution of respondents according to their soap preference among hibiscus soap:

Soap preference among hibiscus soap.	Girls	Boys	Total
1 (extremely unlike)	10 (16.6%)	1 (1.6%)	11(9.1%)
2 (unlike)	12 (20%)	0 (0%)	12(10%)
3 (neutral)	11 (18.3%)	0 (0%)	11(9.1%)
4 (like)	3 (5%)	8 (13.3%)	11(9.1%)
5 (extremely like)	24 (40%)	12 (20%)	36(30%)

Distribution of respondents according to their preference of features in Hibiscus soap:

For sample A:

S.No	Features	Usage rate	Availability	Fragrance	Foamy	Moisturizer	Medicinal benefits
		f (%)	f (%)	f (%)	f (%)	f (%)	f (%)
1.	Excellent	82 (68.3%)	18 (67.5%)	72 (60%)	63 (52.5%)	76 (63.3%)	80 (66.6%)
2.	Very Good	34 (28.3%)	30 (25%)	35 (29.1%)	46 (38.3%)	27 (22.5%)	26 (21.6%)
3.	Good	4 (3.3%)	9 (7.5%)	13 (10.8%)	11 (9.1%)	17 (14.1%)	14 (11.65)
4.	Average	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)
5.	Poor	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)

Usage rate: 68.3% of respondents find the soap's usage rate to be excellent, followed by 28.3%, 3.3% very good and good respectively.

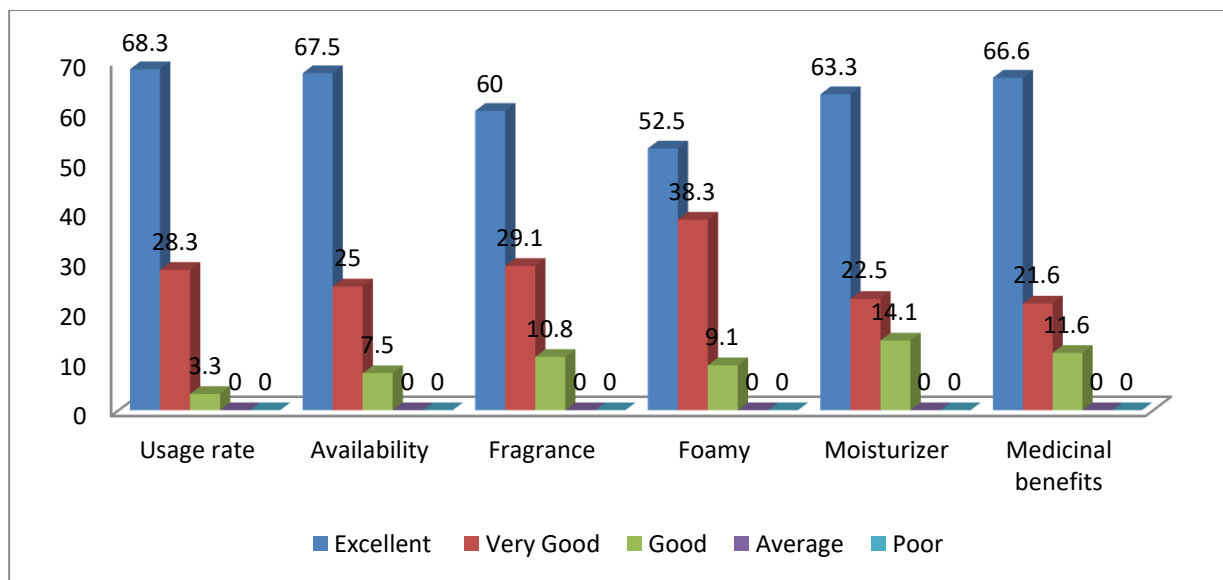
Availability: 67.5% of respondents rate the soap as being excellently available followed by 25%, 7.5% very good and good respectively.

Fragrance: 60% of respondents consider the fragrance of the soap to be excellent, implying a pleasant and appealing scent followed by 29.1%, 10.8% very good and good respectively.

Foamy: 52.5% of respondents find the soap to be excellent in producing foam followed by 38.3%, 9.1% very good and good respectively.

Moisturizer: 63.3% of respondents rate the soap as excellent in moisturizing the skin followed by 22.5%, 14.1% very good and good respectively. While **Saurav et al. (2022)** in study revealed that moisturizer in soap help the skin to become soft.

Medicinal benefits: 66.6% of respondents perceive the soap as having excellent medicinal benefits followed by 21.6%, 11.6% very good and good respectively. It may offer added health benefits such as antibacterial or soothing properties.



For sample B:

S.No	Features	Usage rate	Availability	Fragrance	Foamy	Moisturizer	Medicinal benefits
		f (%)	f (%)	f (%)	f (%)	f (%)	f (%)
1.	Excellent	5 (4.1%)	3 (2.5%)	21 (17.5%)	0 (0%)	25 (20.8%)	83 (69.1%)
2.	Very Good	11 (9.1%)	6 (5%)	51 (42.5%)	8 (6.6%)	58 (48.3%)	28 (23.3%)
3.	Good	49 (40.8%)	39 (32.5%)	42 (35%)	39 (32.5%)	37 (30.8%)	9 (7.5%)
4.	Average	43(28.3%)	51 (42.1%)	6 (5%)	60 (50%)	0 (0%)	0 (0%)
5.	Poor	21 (17.5%)	21 (17.5%)	0 (0)	13 (10.8%)	0 (0%)	0 (0%)

Usage rate: 4.1% of respondents find the soap's usage rate to be excellent followed by 9.1%, 40.8%, 28.3%, and 17.5% very good, good, average and poor respectively.

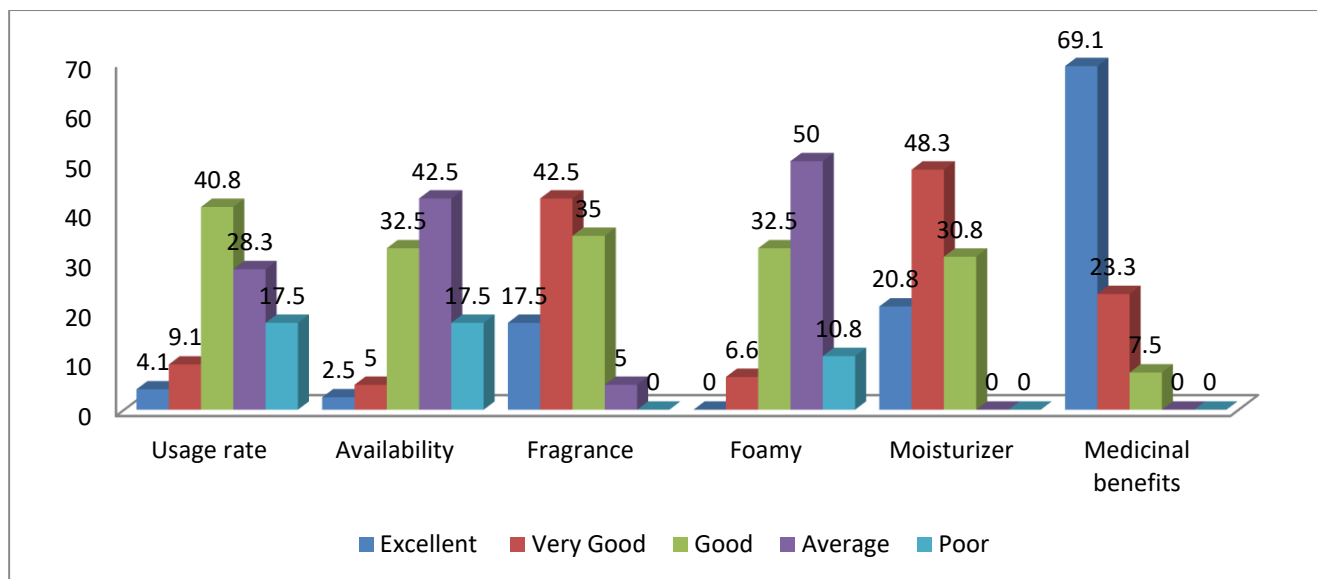
Availability: 2.5% of respondents rate the soap as having excellent availability followed by 5%, 32.5%, 42.1%, and 17.5% very good, good, average and poor respectively.

Fragrance: 17.5% of respondents consider the fragrance of the soap to be excellent followed by 42.5%, , 35%, 5%, very good , good and Average respectively.

Foamy: 6.6% of respondents find the soap to be very good in producing foam followed by 32.5%, 50% and 10.8% very good, good, average and poor respectively.

Moisturizer: 20.8% of respondents rate the soap as excellent in moisturizing the skin followed by 48.3%, 30.8% very good and good respectively. While **Saurav et al. (2022)** in study revealed that moisturizer in soap help the skin to become soft.

Medicinal benefits: 69.1% of respondents perceive the soap as having excellent medicinal benefits followed by 23.3%, and 7.5%, very good and good respectively.



Part -C

S.No	Features	Usage rate	Availability	Fragrance	Foamy	Moisturizer	Medicinal benefits
		f (%)	f (%)	f (%)	f (%)	f (%)	f (%)
1.	Excellent	4 (3.3%)	5 (4.1%)	19 (15.8%)	1 (0.8%)	26 (21.6%)	83 (69.1%)
2.	Very Good	7 (5.8%)	4 (3.3%)	51 (42.5%)	4 (3.3%)	29 (24.1%)	28 (23.3%)
3.	Good	42 (35%)	41 (34.1%)	39 (32.5%)	50 (41.6%)	58 (48.3%)	9 (7.5%)
4.	Average	46 (38.3%)	48 (40%)	9 (7.5%)	55 (45.8%)	7 (5.8%)	0 (0%)
5.	Poor	21 (17.5%)	22 (18.3%)	2 (1.6%)	10 (8.3%)	0 (0%)	0 (0%)

Usage rate: 3.3% of respondents find the soap's usage rate to be excellent followed by 5.8%, 35%, 38.3%, and 17.5% very good, good, average and poor respectively.

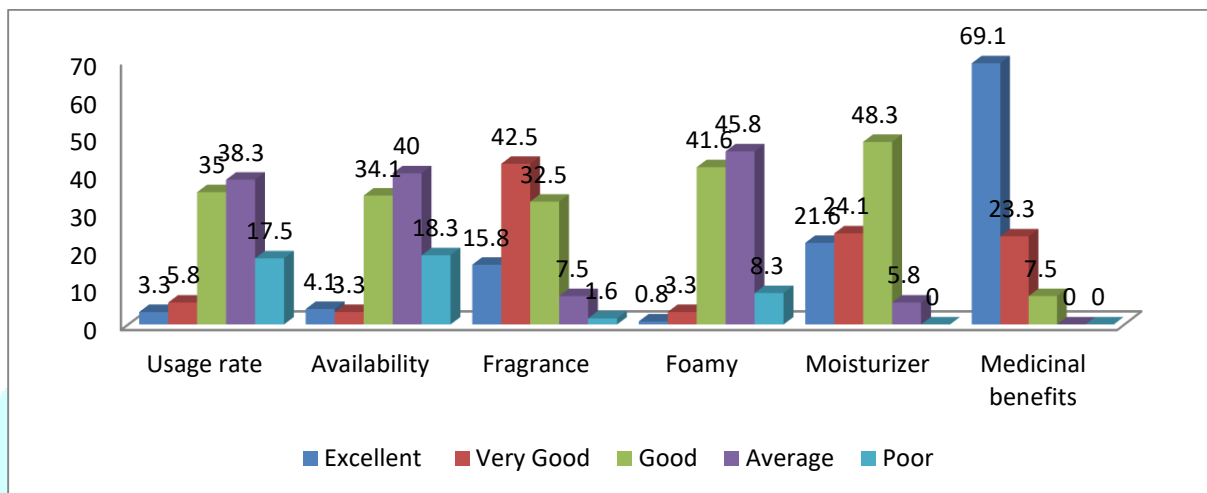
Availability: 4.1% of respondents rate the soap as having excellent availability followed by 3.3%, 34.1%, 40%, and 18.3%, very good, good, average and poor respectively.

Fragrance: 15.8% of respondents consider the fragrance of the soap to be excellent followed by 42.5%, 32.5%, 7.5%, and 1.6% very good, good, average and poor respectively.

Foamy: 0.8% of respondents find the soap to be excellent in producing foam followed by 3.3%, 41.6%, 45.8% and 8.3% very good, good, average and poor respectively.

Moisturizer: 21.6% of respondents rate the soap as excellent in moisturizing the skin followed by 24.1%, 48.3% and 5.8% very good, good and average respectively. While **Saurav et al. (2022)** in study revealed that moisturizer in soap help the skin to become soft.

Medicinal benefits: 69.1% of respondents perceive the soap as having excellent medicinal benefits followed by 23.3%, 7.5% very good, good respectively.



Summary and Conclusion:

The study focuses on the development and evaluation of herbal soaps incorporating specific medicinal plant extracts. It reviews existing literature on herbal soap formulations and their benefits, emphasizing the use of natural ingredients like hibiscus, neem, and essential oils such as lavender and peppermint. The methodology includes the selection of Ayodhya district as the study locale, sample size determination, variables for soap standardization, selection of medicinal plants (e.g., hibiscus), preparation of herbal extract, optimization, soap preparation, assessment, and statistical analysis. Results indicate a preference for herbal soap among respondents, primarily driven by awareness through advertisements and personal networks. Preferences for essential oils vary, with neem oil being favored for its antibacterial properties. The evaluation of hibiscus soap shows high ratings for usage rate, availability, fragrance, foaminess, moisturizing effects, and medicinal benefits.

Conclusion: The study underscores the popularity and potential benefits of herbal soaps among consumers. Awareness through advertisements and personal networks significantly influences consumer choices.

Preferences for essential oils highlight the importance of incorporating ingredients with specific therapeutic properties. The evaluation of hibiscus soap demonstrates its efficacy in meeting consumer expectations regarding usage, availability, fragrance, foaminess, moisturizing effects, and medicinal benefits. These findings suggest a promising market for herbal soaps and emphasize the importance of further research and product development in this domain to meet consumer demands for safe, effective, and environmentally friendly personal care products.

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