



The Sociological Study of the Usage of Nanotechnology in Skincare: A Study of Multan, Pakistan

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Sonia Hayat¹ Madieha Akram² Aamir Hayat³

Abstract: In this paper we review the usage of nanotechnology in skincare. The skincare is excessively commonly used around the world. The researcher narrated beauty and its importance with the help of female and male patients' views about the skincare of nanotechnology. The present study is an attempt to address three aspects in the sampled population; now a day's female and men attraction towards skincare products and marketing, female face impact of using skincare products and socioeconomic, the role of beautiful skin in the context of young females and men it is necessary to female and men are really aware of nanotechnology skin care in their beauty. Their presence and importance in nanotechnology skincare are associated with beauty, environmental, and consumer perception.

Key Words: Socioeconomic, Environmental, Awareness, Consumer Perception, Nanotechnology Skincare

Introduction

Working with materials at the atomic and molecular level, nanotechnology has become relevant from healthcare and electronics to several other sectors, an innovative force in everyday consumer commodities. More recently, it has made a very clear entrance into the skincare sector, offering new concepts promising better product performance and increased consumer security. The Sociological aspects of applying nanotechnology in cosmetics, with a focus on the public view. And the ethical foundations underlying the concerns it raises, the legal hurdles it presents, and its wider scope. Effects on social expectations and practices. Knowing how this growing Technology influences commercial practices, cultural aesthetic norms, and personal decisions. Multan, a town in southern Punjab with a rich background, will be the setting of this study. Pakistan: Multan provides a particular blend of present economic growth with strong historical roots. Contemporary scientific developments and traditional beauty treatments. The city inhabitants range offers a different backdrop for exploring how new technologies influence both rural and metropolitan centres, especially as nanotechnology is adopted and used in everyday life, in skincare routines (Rahim, 2019).

Growing Interest in Nanotechnology in Skincare

Considered among the most significant, nanotechnology solves particle control on a major technical development of this century; micro sales' impact is widespread across many different things. Among disciplines, cosmetics is not an exception. Nanotechnology has developed new possibilities in skincare. Consequently, it significantly enhances the effectiveness of sunscreens, anti-ageing creams, and lotions. As a result, these products target skin issues with growing exactness and efficiency. Yet still, given these advances, using nanotechnology in cosmetics has raised a number of ethical issues. And problems involving society include concerns. Long-term issues abound; awareness has sparked ongoing arguments. Thus, investigating its sociological results, it is imperative to grasp not only how the technology works (Raszewska-Famielec & Flieger, 2022).

¹ M.Phil. Scholar, Department of Sociology, The Women University, Multan, Punjab, Pakistan.
Email: sonamhayat698@gmail.com

² Assistant Professor, Department of Sociology, The Women University, Multan, Punjab, Pakistan.
Email: dr.madieha@gmail.com

³ Assistant Professor, School of Sociology, Minhaj University Lahore, Punjab, Pakistan.
Email: draamir.soc@mul.edu.pk

Sociological Effects of Nanotechnologies in Skincare

Considering nanotechnology from a sociological angle entails travelling beyond its technical and scientific functions. It involves considering this social impact. Evolution: culturally shaped attitudes, perceptions of beauty, and personal grooming habits. Though Renowned for its ability to provide targeted, effective skincare products, nanotechnology also presents significant problems regarding public health, moral concerns, and regulatory oversight from its growing Use. How more generally this technology affects society transforms consumer Areas of Knowledge, Anticipations, and influences sector norms are rather significant investigations, that is, better knowledge of how technical advancements influence not just our everyday beliefs about self-care and looks, as well as the market itself (Mittapally & Afnan, 2019).

Consumer Acceptance of Nanotechnology and Perception

A main concern in the study of nanotechnology is how consumers see and respond to skincare. Among the advantages of such items often praised as sophisticated remedies offering better Skin are skin revival, improved absorption of nutrients, and anti-ageing properties. Public perception is split as well, nevertheless. Nanotechnology is unknown to many customers. Regularly concerns involving product safety and possible side effects. This ambiguity can influence how readily people adopt these products. Sociological research can help clarify by looking at elements like brand transparency, trust in science, and reasons for consumer resistance. Understanding of potential health consequences and the influence of stories in advertising and media. How Nanotechnology Marketing Uses Part Beauty Standards Cosmetics nanotechnology is sold very closely with present beauty norms and ideals. Businesses that focus on skincare often take advantage of society's obsession with youth and immaculate skin and physical perfection, providing nanotechnology-infused items as advanced remedies to conventional aesthetic problems (Gupta et al., 2015).

The Role the Part Beauty Standards Play in Nanotechnology

Advertising Nanotechnology in beauty is advertised very closely with contemporary beauty standards and principles. Companies focused on skincare occasionally use society's fascination with youth to their benefit. Immaculate skin and physical perfection provide sophisticated nanotech-infused products as remedies to age-old aesthetic problems. These items are often marketed as means to reach an idealised form, from wrinkle reduction to scar lightening, beauty's vision reinforces unreasonable expectations. Particularly for women, beauty standards can aggravate social pressure to maintain a Perfect appearance. Nanotechnology, in this sense, also participates in keeping a small, technology-driven view of beauty, which brings socially severe problems about how innovation affects gender and personal identity (Gupta et al., 2012).

Marketing and Advertising

Consumer Perception Impact Marketing helps to define consumers' attitudes toward skincare products considerably. Many times, beauty companies stress the modern scientific features of their products, showing the accuracy and creativity of nanoparticles to increase their attractiveness. Promotional language employed in these initiatives can, at times, exaggerate or misrepresent the actual Science, thus establishing unreasonable consumer expectations. Sociologists study how such Advertising shapes public knowledge, therefore influencing ideas of the assumed worth of these ideas and skincare, nanotechnologies. As nanotech-enhanced cosmetic premium product lines are seeing an increase in this, it raises concerns about this creation; it could worsen current access. Sociologists investigate how the commercialisation of such high-tech beauty solutions could exacerbate social inequality. Where having great skincare becomes a symbol of benefit rather than a widely available option (Gupta, 2013).

Ethical Problems and Trust-Building among Consumers

Incorporating nanotechnology into skincare formulations raises many moral questions, especially around consumer awareness, safety, and informed consent. Many users might not know what nanoparticles are or how they interact with the skin, emphasising the need for unambiguous and straightforward labelling. Questions about whether customers are sufficiently informed abound as well, regarding the long-term consequences of using such goods. Sociological studies investigate how cosmetic Companies negotiate the tension between upholding moral values and encouraging creativity.



Aspiring to make sure that consumer trust is sustained rather than compromised by quick product advancement (Souto et al., 2020).

Public Health Issues and Regulation

The application of nanotechnology in cosmetics poses legislative obstacles since it is a relatively new field. Especially their capacity to enter the skin, authorities must evaluate the safety of nanoparticles (Bellu et al., 2021).

Nanotech Skincare Cross-Cultural Perspectives

Nanotechnology in beauty and skincare varies widely across several civilisations. Both attitudes and local legal frameworks influence levels of technical confidence. The means by which such commodities are manufactured and eaten is acquired. Countries like the United States. Usually, there is greater excitement in Japan for incorporating cutting-edge technologies into daily life. Personal care routine; European Consumers, on the other hand, approach these more carefully, innovations sculpted by tougher rules, more emphasis on health. And standards, along with safety. Studies in sociology on these cultural variances reveal how the public's Openness is affected by national identity, historical experience, and social standards. Nanotechnology in everyday skincare (Jacobs et al., 2010).

Technical Skincare and Gender Dynamics

How nanotech-based skincare products are advertised and consumed. Advertising campaigns occasionally centre exclusively on women, especially those emphasising anti-ageing benefits. This trend reflects society's attitudes toward women looks and aging. The use of Cutting-edge technology in cosmetic products begs questions of how these technologies connect with and perhaps reinforce traditional gender role expectations (Epstein, 2021). Sociological research in this area inquires whether such changes empower women by offering more Options or whether they sustain ongoing pressure to satisfy phantom beauty standards (Gupta, 2013).

Methodology

Methodological Approaches

Employing a quantitative technique, the study investigated the sociological aspects of the Use of nanotechnology in skin care therapies in Multan. A closed-ended survey tool is used for gathering information. This method lets one assess responses' attitudes and awareness. The study's emphasis is on public knowledge of nanotechnology skin care. Respondents were selected from a range of dermatology clinics in Multan.

Research Design

The design of the research provided a methodical method for collecting and analysing the information. Ensured that research objectives aligned with data collection and analysis methodologies. Course-long consistency (Badhe et al., 2023).

Universe

In this case, it encompasses patients frequenting multiple dermatological clinics in Multan. These clinics help to identify the population from which the sample was taken.

Target Audience

From Multan's skin clinics, 301 patients constituted the targeted chosen population. This group includes those meeting the requirements; it is a little piece of the bigger cosmos. Important for the investigation. Sampling from this population could help one to generalise results. Clear of the resources and time demands of sampling the whole population (Iyer & Chavan, 2017).

Sampling Strategy

To guarantee the generalizability of the results, a representative sampling strategy was adopted. Sampling is the choosing of people from a group to help collect information. Participants were chosen using a random sampling approach in this

investigation, hence guaranteeing that every person had an equal opportunity of being included. This method sharpened the reliability and objectiveness of the findings (Ahuja & Bajpai, 2024).

Probability Sampling

Using simple random sampling, the researcher guaranteed that every member of the population got an equal opportunity to be chosen. It turned out that the whole population was both more effective and less expensive. A three-point-seven collection instrument through a methodical survey is a widely accepted technique for gathering data from a given population. A closed-ended questionnaire was used for the collection of data (Demir, 2021).

Tool for Collecting

Information: A systematic survey, a highly established means for gathering data, was used. Gaining knowledge from a particular group of people. The survey was composed mostly of closed-ended questions. Questionnaires are created to collect both fact-based and opinion-based data from people. Surveys are frequently used in collecting self-reported data and are efficient for this purpose.

Formal Questionnaire

A classic quantitative research tool, the questionnaire was set up and closed-ended. It comprised predetermined response categories like "very bad," "bad," "good," and "very good." Among the attributes of the arranged questionnaire were:

- ▶ Questions that are clearly stated and targeted
- ▶ Pre-arranged format to guarantee thorough data gathering
- ▶ Employed in formal research contexts
- ▶ Cross-referencing against available data
- ▶ Regular application in research in the social sciences

Variables

Including socioeconomic, cultural, environmental, and awareness-related elements.

Data Editing

Two checks were performed on every finished questionnaire to ensure thoroughness and correctness. Because it was challenging to re-contact post-survey participants, this phase was vital for keeping data quality. The editing process guaranteed justness. Information Assessment Statistical Package for the Social Sciences (SPSS) version 20 was used to conduct data analysis. Sciences). This program helped the researcher to logically arrange and analyse the information gathered.

Data Analysis

Data analysis was performed using SPSS version 20 (Statistical Package for the Social Sciences). This software allowed the investigator to methodically establish and understand the collected data.

Coding

Responses from the questionnaire were coded for easier processing and analysis. Coding transforms raw data into standardised formats, simplifying entry into SPSS. Each response category was assigned a numerical code (e.g., 0 = Strongly Agree, 1 = Agree, 2 = Strongly Disagree, etc.), which allowed for clear and efficient data analysis.

Testing

A pilot test was conducted to evaluate the effectiveness of the questionnaire. A sample of 301 individuals, separate from the main survey group, was selected randomly to pre-test the instrument. The pilot study enabled the researcher to identify and address any issues with the questionnaire before full-scale deployment. Minor adjustments were made based on the feedback. Likert scale methodology and SPSS were used during this phase for better instrument calibration.



Tabulation

Tabulation refers to the systematic organisation of data into tables, typically using rows and columns. This step simplifies interpretation and enables comparisons. The researcher used statistical tests such as the F-test, T-test, and descriptive statistics to analyse the data. Results were presented in tables and graphs, showcasing metrics such as means, medians, and standard deviations. This structured presentation facilitated clearer communication of findings (Rathnasinghe et al., 2024).

Results

Table I

One-Sample Test

	Test Value = 0					
	T	Df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	Upper
Consumer perception	94.136	300	.000	17.59468	17.2269	17.9625
Shifting societal beauty standards towards more unrealistic ideals.	47.257	300	.000	2.54817	2.4421	2.6543
Social benefits that positively influence public perceptions of beauty	40.502	300	.000	2.55814	2.4338	2.6824
such as safety and accessibility, affect societal views on beauty	40.502	300	.000	2.55814	2.4338	2.6824
Products create a sense of urgency and necessity around beauty standards	36.398	300	.000	2.39867	2.2690	2.5284
Nanotechnology, as a global beauty trend, becomes more technologically driven.	36.225	300	.000	2.39203	2.2621	2.5220
Benefits compared to traditional beauty treatments	40.502	300	.000	2.55814	2.4338	2.6824
cultural beliefs about natural and herbal ingredients influence my preference for traditional	47.257	300	.000	2.54817	2.4421	2.6543
Traditional beauty practices in my culture make me hesitant to try nanotechnology.	47.257	300	.000	2.54817	2.4421	2.6543

This table shows the results of a one-sample t-test comparing several statements related to beauty standards and nanotechnology to a test value of zero. All the values have a significance (Sig. 2-tailed) of .000, meaning the results are statistically significant. In simple terms, people strongly agree with the statements listed. The first row, "Consumer perception," has a very high mean difference (17.59), suggesting people have strong opinions or awareness about beauty trends. Other statements, such as the shift toward unrealistic beauty standards, social influences, cultural beliefs, and technological changes in beauty products, also show positive mean differences around 2.4 to 2.5 (Kumud & Sanju, 2018). This means respondents generally agree that these factors affect beauty standards. The confidence intervals (like 2.44 to 2.65) are narrow, meaning the results are reliable. Cultural and social aspects, along with product marketing and new technologies like nanotech, all seem to play a big role in how people view beauty. Also, traditional beliefs can cause hesitation toward trying new beauty tech. Overall, the data suggest strong agreement that beauty standards are influenced by a mix of modern trends, cultural values, and new technologies.

Conclusion

The application of nanotechnology in skincare marks a notable advancement in the cosmetic industry, offering improved product performance. However, it also brings forward essential sociological questions regarding ethical practices, public awareness, and the reinforcement of narrow beauty ideals. While these innovations may provide visible benefits, the lack of consumer understanding about their long-term effects is concerning (Virmani & Pathak, 2022). Many users are unaware of potential health risks associated with these products. Hence, increasing public awareness is crucial, especially

when it comes to harmful ingredients in products like skin lightening creams. The research findings, gathered using descriptive statistics, highlight that 66.3% of the participants had already begun using nanotechnology skincare products.

The researcher collected responses from various skin care clinics in Multan, including City Skin Clinic (Dr. ShaziaZubair), Multan Aesthetics (Dr. Kabir), and Skintek Clinic (Dr. Asma). The results emphasize the need for informed usage and professional guidance when selecting and applying skincare products.

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