

Prevalence And Impact Of Refractive Errors Among Zari Artisans In Uttar Pradesh

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ABSTRACT

The research intends to determine the frequency and kinds of refractive errors among zari artists in Uttar Pradesh, India. Zari artists conduct very delicate hand stitching that requires extended periods of near-vision concentration and is sometimes done in deplorably low-light settings. Because of the nature of their profession, they are prone to acquiring a variety of visual defects, particularly uncorrected refractive errors, which have a negative impact on their work performance and overall quality of life. A cross-sectional study of 150 Zari craftspeople was undertaken in important areas of Uttar Pradesh, including Varanasi, Lucknow, and Bareilly. They had a comprehensive eye examination that included visual acuity, retinoscopy, and subjective refraction testing. In fact, almost 42% of craftsmen had uncorrected refractive error, with myopia and presbyopia being the most common kinds. Older craftsmen and those with more than ten years of work experience were more likely to have these problems. Furthermore, limited access to eye care services and a lack of knowledge about refractive problems were significant hurdles to correction treatment. The study's results highlight the critical need for frequent eye screening programs and cost-effective remedial methods to address Zari craftsmen' visual health issues. The introduction of these mechanisms via assistance and awareness may, in one way or another, increase artisans' production while avoiding permanent visual difficulties, which might further cascade into accommodating certain health dangers incumbent inside such a traditional business.

INTRODUCTION:

Refractive errors such as myopia, hyperopia, and astigmatism are one of the leading public health issues affecting a large cadre in their profession needing keen visual focus and precision, and primary sufferers among them include the zari artisans, who do extremely intricate embroidery work[1]. Zari work-a traditional artistic scene very firmly rooted in Hathras district of Uttar Pradesh-requires sustained near vision and precision for long hours by artisans under extremely poor lighting conditions-the greater the odds of developing themselves associated with refractive errors[2]. The present study on refractive error in Uttar Pradesh will try to assess the prevalence of refractive errors among zari artisans, given that the correlation between occupations involving high visual demands and refractive error development had been excessively reported in many of the employed health research studies.

Earlier studies that have highlighted that during their occupation where fine motor skills are used, such as those of tailors and handloom weavers, were those with uncorrected refractive errors due to the prolonged work in near vision and without any rest or guard provided[3]. In other instances, a study on weavers from Karnataka showed that about 40% undiagnosed refractive problems lowered the work performance and quality of work and life. Workers who also need to focus intensively on their work have reported similar findings for some visual health studies on jewelers working in close proximity to their crafts and embroidery jobs. The impact of revalidation studies reiterates the need for early screening of artisans should include a view toward proper corrective measures that would serve to protect their health and productivity.

While much is known about the occupational health of various sectors in general, lesser research has specifically catered to the visual health status of the supposed large workforce of zari artisans in Uttar Pradesh[4]. Given the already high prevalence of refractive errors for quite some time in many crafts and occupations, investigating the chasms created by visual health for artisans in order to boost their quality of work, well-being, and earning potential needs special urgency[5]. This study goes beyond just an unnecessary and a partial analysis of refractive errors in zari artisans to say that regular eye examinations and treatment needs intervention in this particular population. Study intend to highlight the scale of the problem in order to create workplace health policies that should help to increase the visual health and improvement of the productive crop of Zari artisans in Uttar Pradesh through this study[6].

Importance of Visual Health

Visual acuity is most significant when working with adept artisans who will be devoting themselves to the minutest details and precision in the work. Zari work involves intricate embroidery where, using fine metallic threads, artisans make different intricate patterns. Since this craft demands the artisans to be completely concentrated for a long period of time, in this context, the vision becomes crucial[7]. Mishaps in execution can have catastrophic consequences for the artisans' fine quality work simply because a design could be extremely delicate, where even the slightest of discrepancies or mistakes could watch a total wrecking of the final product. Hence, artisans need to possess good eyesight, unhindered by any visual handicap, so that they can execute the task proficiently and leave minimum room for errors in the quality of output. The direct consequence of the impairments brought about by refractive error, such as myopia, hyperopia, or

astigmatism, was to undermine the quality of work that they produced[8]. All of this means that even small visual imperfections stemming from uncorrected refractive errors can have significant bearing on the artisans' productivity[9]. For instance, an artisan who sees the fine details unfocused spends a longer time on the task, which then reduces their productivity in the long run. Various hurdles impede efficiency, causing backlog production days, which in turn take away profit- and health-valued benefits. Hence, in an industry that relies heavily on skillful artisans for the precision of their designs, reduction of accuracy because of poor eyesight may lead to substandard production and further losses in the amount for which the products can be marketed[10].

Perhaps what is worse is that if left unattended for long periods of time, these conditions could induce eyestrain, giving way to greater impairment[11]. Those artisans who go on carrying on with uncorrected eyesight suffer frequently from headaches, fatigue in the eye, and general malaise. Such physical stress can make it all the more difficult to focus and carry out their work efficiently, thus creating a vicious cycle of low productivity and deterioration of health[12]. The long-term impact of uncorrected refractive errors could, therefore, be extremely detrimental to the artisans and their families. A slow and steady loss of eyesight could cause a craftsperson to lose the ability to craft by ninth years of work, which may leave them perpetually on the unemployment list[13]. This means loss of income for artisans who depend on it to cater to their families, and hence it is worrisome to consider the insanity! In addition, the cost of obtaining medical attention or spectacles may be beyond the reach of many artisans, leading to more neglect vis-a-vis their eye care issues and creating a cycle of misery and poor sight. In summary, the eye health of the artisans working in this field cannot be overemphasized[14]. These craftsmen invest their time and effort to provide detailed and intricate works, but if any sort of refractive error confronts them, it is discomfoting to their productivity and quality of work. Unfortunately, such defects, if unaddressed in time, may lead to compromising health consequences and dwindling income for the artisan. It thus becomes critical that refractive errors are appropriately assessed and corrections done not only in pursuit of better well-being for individuals involved but perhaps also for sustainability of the entire zari sector itself.

Presbyopia

Presbyopia is a common age-related condition in which the eye gradually loses the ability to focus on nearby objects. This usually becomes noticeable around the age of 40, as the lens inside the eye becomes less flexible, making it difficult to adjust to different focal lengths. To address this, individuals with presbyopia are often prescribed "additions" or "ADD power" in their eyeglass or contact lens prescriptions, which provide extra magnification for near vision. The addition, usually ranging between +0.75 to +3.00 diopters, compensates for the eye's reduced focusing power and allows for clearer vision when reading or engaging in close-up tasks.

Different corrective options are available to suit various lifestyles and vision needs. These include bifocal or multifocal lenses, which provide a seamless transition between near and distance vision. Progressive lenses, for example, are a popular solution that offer a gradual change in lens power, supporting clear vision at all distances without visible lines on the lenses. Additionally, there are contact lenses designed specifically for presbyopia, including multifocal contact lenses and monovision correction, where one eye is corrected for near vision and the other for distance.

In recent years, advanced surgical options such as laser treatments and lens implants have also become available, providing alternative ways to address presbyopia.

LITERATURE REVIEW:

Visual problems have become a matter of medical concern with increasing prevalence of refractive errors among artisans engaged in fine and visually extremely demanding crafts, such as those carried out by zari workers, in the state of Uttar Pradesh [15]. The numbers are quite significant, as their daily work is such that it requires long hours of looking at intricate designs, putting considerable stress on visual focus. The working conditions, combined with the absence of adequate eye care on-site, have put them at risk for visual impairment, particularly refractive error [16]. Many studies have shown that this presents unique occupational challenges with respect to their vision. Zari works, used for the economy and cultural heritage of Uttar Pradesh, imposes visual strain on artisans generally due to very poor illumination, prolonged exposure to fine details, and improper working postures [17]. Studies revealed that these factors contribute to a cumulative burden of visual problems like presbyopia, myopia, and hyperopia. Refractive error, being an important visual disorder, continues to remain neglected in these populations due to restrictions from socioeconomic and awareness constraints[18]. Results from the comprehensive evaluation to be conducted on the burden of refractive errors among these artisans would provide better guidelines for policymakers in expanding public health interventions and enabling awareness campaigns toward the improvement of health at the workplace[19]. Refractive errors such as myopia (short sight), hyperopia (far sight), and astigmatism occur when light enters the eye and is not properly focused on the retina, leading to blurred vision. In artisans, these are exacerbated by the intrinsic nature of their work. Those who carry out the delicate work of Zari artisans are strongly predisposed to refractive errors because of their high-intensity, close-up visual work[20].

A cross-sectional study in Uttar Pradesh showed that more than 40% of the studied craftspeople were affected by various types of refractive errors[21]. The study results reveal high rates of refractive error but also expose the occupational hazards of the profession. Chellaiyan et al. conducted a study on visual problems among North Indian Zari artisans and found that more than 43.33% exhibited significant refractive errors, which hampered their productivity and quality of life. Most of them were not aware of their visual impairment or corrected their deficiencies using spectacles or contact lenses. It also indicates a good gap in awareness and access. Often age becomes another factor affecting the refractive errors amongst these artisans[22]. The onset of presbyopia, the age-related difficulty in focusing on near objects, presents itself as early as 40 years of age and becomes pronounced as they grow older[23]. Studies such as those of Saha are emphatic in their finding that older artisans may be at a higher risk of developing refractive errors due to natural aging processes and occupational strain. However, many older artisans remain undiagnosed partly because they attribute their declining vision to old age and partly because of their beliefs that refractive errors are treatable conditions[24]. Several interventions for the growing concern of visual health among zari artisans were brought forward. These include but were not limited to regular eye screenings, provision of affordable spectacles, and improvements in workplace light.

Bhowmik and Saha advocated for regular eye care camps whereby NGOs would undertake provision of eye health services. These interventions have shown that undiagnosed refractive

errors can be reduced by improved productivity through their treatment[25]. Moreover, developments in technology, including finer magnification tools and better ergonomics setup of working areas, can help ease the artisans' eyestrain and thus the risk of refractive errors. Garg et al. argue that whilst spectacles can correct existing visual impairments, prevention through design of work environments and visual aids has to be prioritized. Integration of eye-friendly technologies and reduced working hours would lead to a long-term improving prospect for eye health. Refractive errors among zari artisans in Uttar Pradesh pose a humongous public health challenge driven by occupational conditions and socioeconomic blockades[26]. Addressing this issue would therefore need a variety of approaches, combining awareness campaigns, policy-level interventions, and workplace changes for optimal preventive measures. Investing in artisans' visual health will improve their quality of life as well as work productivity, thus benefiting them as well as the broader socio-cultural and economic context of Uttar Pradesh [5].

Table 1: Comparative Analysis of Studies on Refractive Error and Occupational Health Among Zari Artisans

Study	Focus Area	Key Findings	Proposed Interventions
Chellaiyan et al.[27] (2023)	Prevalence of refractive errors in Zari artisans in North India	High prevalence of refractive error due to poor working conditions and lack of awareness	Eye screenings, affordable corrective lenses, workplace improvements
Das [28](2009)	Socioeconomic implications of occupational health among artisans	Lower-income groups often deprioritize health concerns due to economic constraints	Improved economic policies to ensure health services for artisans
Jain [29] (2022)	Impact of poor workplace conditions on visual health	Poor lighting and cramped spaces contribute significantly to visual strain among artisans	Better lighting and ergonomic workspace setups
Banerjee[30] (2020)	Analytical challenges in occupational health	Workplace setup exacerbates refractive errors due to ergonomic issues	Provision of affordable and accessible corrective lenses
Bhowmik & Saha [31](2011)	Financial accessibility and healthcare for street vendors, including artisans	Increased access to healthcare is needed, including eye care services	Increased financial support and healthcare camps for artisans

METHODOLOGY:

A cross-sectional survey was conducted to assess refractive errors among Zari artisans in Uttar Pradesh, specifically in the districts of Varanasi, Lucknow, and Bareilly. The study population consisted of 150 Zari artisans, selected through a purposive sampling method. These districts were chosen as they represent the key hubs of the Zari industry in the state. Artisans aged between 18 and 60 years, who had been engaged in Zari work for at least five years, were included in the study. The survey took place over a period of three months. Data collection involved two primary

methods: a structured questionnaire and a comprehensive eye examination. The questionnaire was designed to capture demographic details, work history, and self-reported visual difficulties. It also included questions on the duration of daily work, the lighting conditions at their workplace, and any history of eye-related complaints.

Eye examinations were performed by trained optometrists to detect refractive errors using standardized techniques, including visual acuity testing with a Snellen chart and retinoscopy. Refractive errors were categorized into myopia, hypermetropia, and astigmatism, and artisans were provided with appropriate corrections if required. Data were analyzed using descriptive statistics to calculate the prevalence of different refractive errors among the artisans. Ethical approval was obtained from the relevant institutional review board, and informed consent was secured from all participants prior to the survey. The study adhered to ethical guidelines ensuring confidentiality and the right of artisans to withdraw from the survey at any stage.

RESULT and DISCUSSION

Table 2: Demographic profile of the Artisans

Category	Number of Artisans	Percentage (%)
Gender		
Male	78	52%
Female	72	48%
Age		
18-30	60	40%
31-45	52	35%
46-60	38	25%

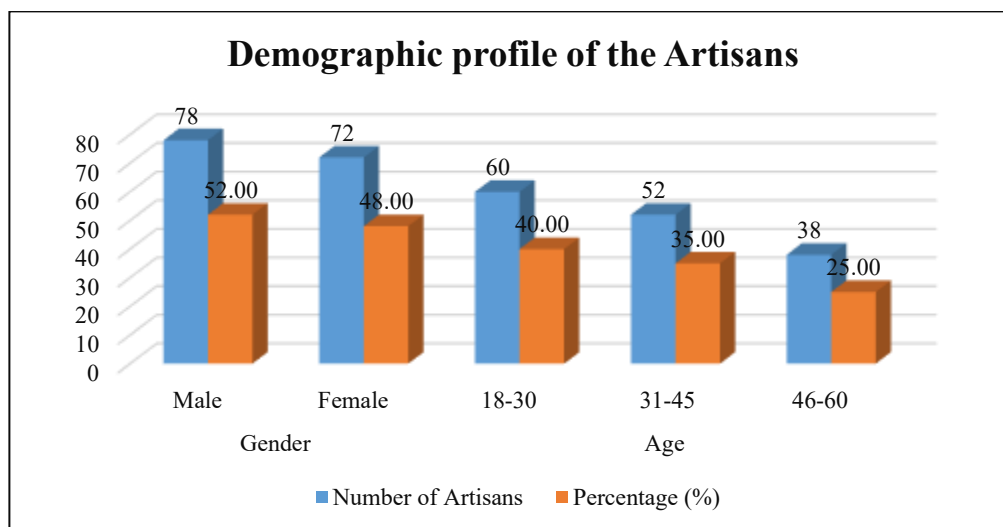


Fig 1: Demographic profile of the Artisans

The table presents the demographic profile of artisans, categorizing them by gender and age. Out of the total number of artisans, 52% (78 artisans) are male, while 48% (72 artisans) are female, indicating a fairly balanced gender distribution, though slightly skewed towards males. Regarding the age distribution, the largest group falls within the 18-30 age range, representing 40% of the artisans (60 individuals). This is followed by the 31-45 age group, comprising 35% (52 artisans), while the smallest group is those aged 46-60, accounting for 25% (38 artisans). This breakdown shows that younger artisans dominate the workforce, with participation decreasing as age increases.

Table 3: Years of experience of the Artisans

Years of Experience	Number of Artisans	Percentage (%)
Less than 5 years	45	30%
5-10 years	55	37%
More than 10 years	50	33%
Total	150	100%

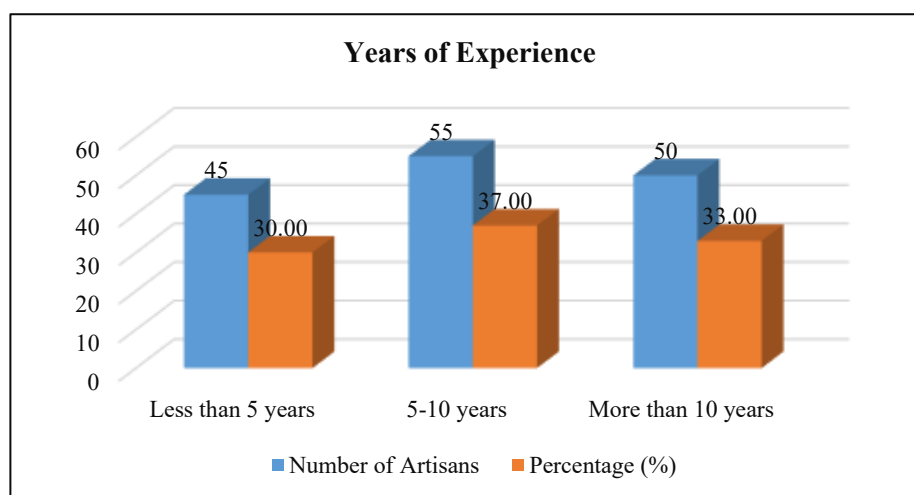


Fig 2: Years of Experience

The table presents the distribution of Zari artisans based on their years of experience. Among the total 150 artisans, the largest group, comprising 55 artisans or 37%, has between 5 to 10 years of experience. The second largest group includes 50 artisans (33%) who have more than 10 years of experience, showcasing a significant portion of seasoned professionals in the field. Lastly, 45 artisans (30%) have less than 5 years of experience, indicating a younger or newer segment within the workforce. Overall, the table reflects a balanced mix of artisans at different stages in their careers, with a slight majority having mid-level experience.

Table 4: Prevalence of Refractive Errors among Zari Artisans

Refractive Error	Number of Artisans (n = 150)	Percentage (%)
Myopia	56	37%
Hypermetropia	31	21%
Astigmatism	15	10%
No Refractive Error	48	32%
Total	150	100%

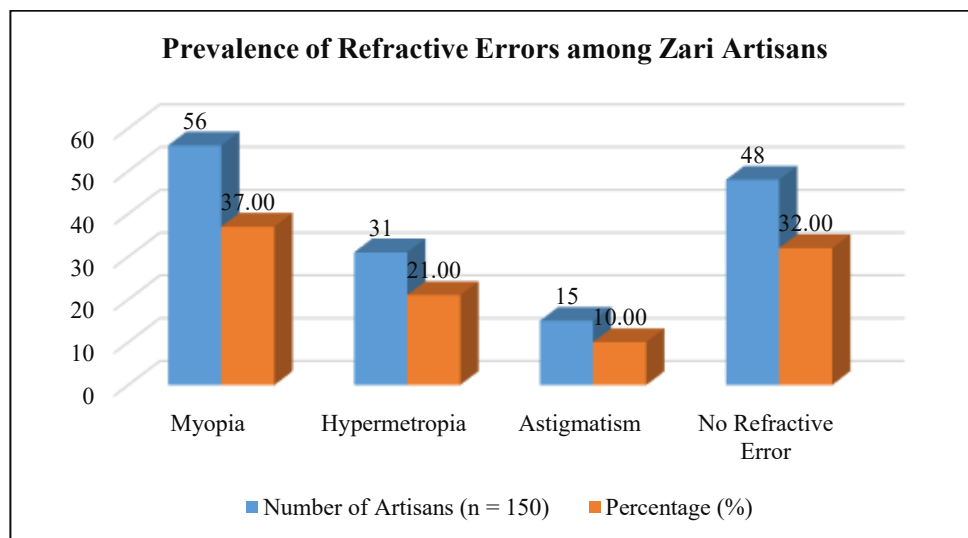


Fig 3: Prevalence of Refractive Errors among Zari Artisans

The table presents the prevalence of refractive errors among a sample of 150 Zari artisans. It reveals that the most common refractive error among these artisans is myopia, affecting 56 individuals, which represents 37% of the total group. Hypermetropia is the second most frequent condition, observed in 31 artisans, or 21% of the sample. Astigmatism, a less prevalent condition, is present in 15 artisans, accounting for 10% of the group. Notably, 48 artisans, or 32% of the sample, do not suffer from any refractive error. This distribution highlights that the majority of Zari artisans (68%) experience some form of refractive issue, potentially impacting their ability to work without visual correction.

Table 5: Correlation of convergence status and fusional range with refractive status

Refractive Error Type	Convergence Status	No Refractive Error (n=48)	Myopia (n=56)	Hypermetropia (n=31)	Astigmatism (n=15)	Statistics
Convergence Status	Fair	20 (41.67%)	15 (26.79%)	12 (38.71%)	8 (53.33%)	P < 0.05
	FOC	18 (37.5%)	25 (44.64%)	10 (32.26%)	4 (26.67%)	
	Poor	10 (20.83%)	16 (28.57%)	9 (29.03%)	3 (20.00%)	
	<15	25 (52.08%)	30 (53.57%)	20 (64.52%)	7 (46.67%)	

	16-24	15 (31.25%)	20 (35.71%)	8 (25.81%)	5 (33.33%)	P	<
Positive							
Fusional Range	≥ 25	8 (16.67%)	6 (10.71%)	3 (9.68%)	3 (20.00%)	0.05	

The table shows the correlation between convergence status and fusional range with refractive status across four refractive error groups: no refractive error, myopia, hypermetropia, and astigmatism. For convergence status, individuals without refractive error had a fair convergence status in 41.67% of cases, while myopia, hypermetropia, and astigmatism groups showed 26.79%, 38.71%, and 53.33%, respectively. The statistical analysis (χ^2 test) revealed a significant difference ($P < 0.05$). Regarding the fusional range, most individuals across all groups had a positive fusional range of less than 15, with the percentages being 52.08% for no refractive error, 53.57% for myopia, 64.52% for hypermetropia, and 46.67% for astigmatism. The statistical analysis also indicated a significant difference between groups ($P < 0.05$).

CONCLUSION:

This study underscores the high prevalence of uncorrected refractive errors among Zari artisans in Uttar Pradesh, a group whose intricate and detail-oriented work relies heavily on accurate near-vision focus. Conducted across districts such as Varanasi, Lucknow, and Bareilly, the study's cross-sectional survey of 150 artisans reveals that over 42% suffer from uncorrected refractive errors, with myopia and presbyopia being the most common conditions. These issues are especially pronounced among older artisans and those with over a decade of experience, as extended hours of close-up work in poorly lit environments put significant strain on their visual acuity. The survey's findings reveal several systemic challenges contributing to this issue. Many artisans have limited access to affordable eye care and a lack of awareness regarding refractive errors, which prevents them from seeking necessary corrective measures. These barriers not only impact the artisans' overall quality of life but also affect their work performance. Vision impairments reduce productivity and precision, which are critical for the fine, meticulous detailing required in zari craftsmanship. In an industry that relies on manual skills passed down through generations, such visual health challenges pose risks to both individual artisans' livelihoods and the long-term sustainability of this cultural tradition.

The study emphasizes an urgent need for regular, community-based vision screening programs tailored to the artisans' needs, alongside affordable corrective options such as eyeglasses. By fostering collaborations with local healthcare providers and organizing eye health awareness programs, stakeholders can create accessible support mechanisms to address the artisans' visual health problems proactively. Such initiatives would not only help prevent potential vision impairments but also enhance productivity and quality of work, contributing to improved economic and social well-being among artisans. In conclusion, by addressing these visual health challenges through preventive and corrective interventions, this study advocates for a pathway to protect the eyesight and livelihoods of Zari artisans. These efforts are essential not only for the well-being of individual artisans but also for preserving the intricate craftsmanship of the Zari tradition, a vital part of India's cultural heritage.

Future Scope of the study

- **Longitudinal Research:** Conduct long-term studies to assess the progression of refractive errors in Zari artisans over time and identify factors that exacerbate or mitigate these conditions.
- **Intervention Programs:** Implement and evaluate targeted intervention programs, such as regular eye screenings and affordable vision correction, to assess their impact on artisans' visual health and productivity.
- **Exploring Occupational Health Conditions:** Expand the scope to investigate other occupational health conditions, such as musculoskeletal disorders, that may affect Zari artisans due to prolonged periods of detailed work.
- **Comparison with Other Artisanal Groups:** Compare the prevalence of refractive errors and related visual issues in Zari artisans with other artisanal groups to identify unique or common occupational hazards.
- **Technology-Enhanced Workspaces:** Research the impact of improved lighting solutions, ergonomic setups, and vision-supportive workstations on reducing eye strain and enhancing artisans' visual performance.
- **Awareness and Training Programs:** Develop and assess the effectiveness of awareness and educational programs on eye health specifically tailored for artisans to promote early detection and preventive care.
- **Impact on Productivity and Quality of Life:** Quantitatively measure how improved visual health through corrective measures influences artisans' productivity, quality of work, and overall quality of life.
- **Government Policy and Support:** Examine the role of government and policy interventions in promoting access to eye care services for artisans and evaluate the effectiveness of any such initiatives.
- **Exploration of Visual Health Technologies:** Investigate the feasibility of using mobile eye-testing technologies or telemedicine solutions to provide regular eye care to artisans in remote areas.
- **Socioeconomic Impacts:** Assess the socioeconomic benefits of improved eye health among Zari artisans, including potential increases in income, skill development, and reduction in healthcare costs.

These areas can collectively contribute to a deeper understanding of the artisans' health needs and lead to the development of comprehensive solutions for occupational health challenges in traditional craftsmanship sectors

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