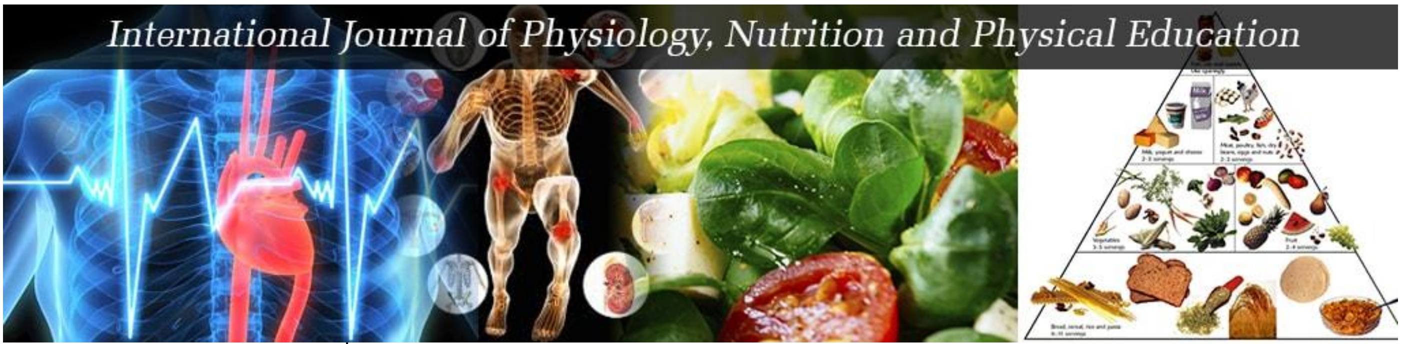

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Gender differences in quality of life among research scholars: A comparative study

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Abstract
The quality of life of research students plays a pivotal role in shaping their academic performance, mental health, and overall well-being. The Quality of Life (QoL) among research scholars in India is influenced by a complex interplay of academic, personal, and environmental factors. Research scholars often face significant challenges, including academic pressures, financial constraints, and limited work-life balance, which can adversely impact their physical and mental health. The main purpose of this study was to determine the specific affected domains of quality of life among PHD students and to assess the gender difference in quality of life among research scholar's.

This study at Dayalbagh Educational Institute, Agra, used an exploratory research design with a quantitative approach. Data was collected via surveys over three months, through SF- 36 questionnaire involving 200 research scholars (100 males and 100 females).

The socio-demographic profile of the participants showed that they were aged 26-30, with more single males (88%) than females (68%). Dietary preferences show females (37%) following vegetarian diets, while males (56%) favor lacto-vegetarian options. BMI data reveals equal underweight proportions (8%), higher obesity in males (68%), and females (18%) with a normal BMI. The SF-36 health score data reveals gender differences across eight domains. Males score higher in physical health, general health, and physical functioning. Females show more variability, particularly in emotional well-being, social functioning, pain, and energy, with wider distributions across performance levels. Males generally have better physical and functional health, while females experience more emotional and energy fluctuations. There were differences in mean scores between males and females across various health domains. Males scored higher in physical health, functioning, and pain, while females reported better emotional well-being and slightly higher energy levels. Overall, total mean scores were nearly identical, with minimal gender differences in health perception.

The study reveals that males tend to have better physical and functional health, with higher scores in physical health, functioning, and pain. Females, however, experience more emotional and energy fluctuations, scoring higher in emotional well-being. Despite these differences, the overall health perceptions between genders were similar, with minimal variance in total mean scores.

Keywords: Quality of life, SF-36, mental health, social well-being, research scholars

Introduction
According to the World Health Organization (WHO), health is "a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity." (World Health Organization, 2006) [1]. This holistic perspective underscores that any compromise in health's physical, mental, or social dimensions can significantly deteriorate an individual's quality of life. Evaluating these dimensions through reliable and validated tools is essential for understanding and addressing the challenges individuals face in maintaining a balanced and fulfilling life. (Khan R, 2018) [2].

The quality of life is intrinsically linked to the living standards of individuals, families, and society as a whole. In today's era of intense competition, people are increasingly engrossed in balancing their personal and professional lives. (Gunnar Németh, 2006) [3]. Consequently, there is a growing focus on improving quality of life, which has emerged as a key metric in assessing overall well-being. Recognizing its significance, health-related quality of life (HRQoL) has garnered attention as a crucial component in evaluating healthcare outcomes. This shift has resulted in the widespread use of various standardized questionnaires designed to assess HRQoL effectively. (Ron D. Hays, 2001) [4]. The quality of life of research students

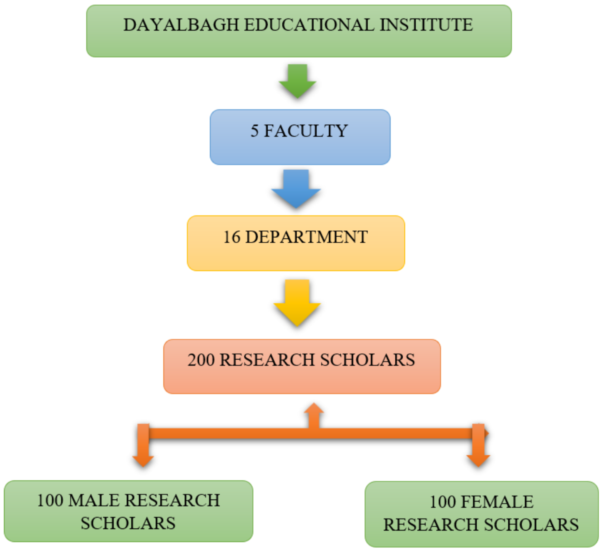
plays a pivotal role in shaping their academic performance, mental health, and overall well-being. Research programs are inherently rigorous and demanding, often requiring students to navigate complex academic challenges, meet tight deadlines, and engage in extensive intellectual efforts. Amid these demands, there is a growing concern about the significant pressure and stress that many research students face. Such stress can negatively impact their mental and physical health, potentially diminishing their quality of life (Nilani L. Shankar and Crystal L. Park, 2016) [7]. Addressing these issues is crucial, as a supportive and balanced environment not only enhances the personal well-being of research students but also contributes to the success and sustainability of research institutions. By prioritizing the quality of life for research students, institutions can foster a more productive, innovative, and resilient academic community (Manuela Schmidt and Erika Hansson, 2018) [18].
The Quality of Life (QoL) among research scholars in India is influenced by a complex interplay of academic, personal, and environmental factors. Research scholars often face significant challenges, including academic pressures, financial constraints, and limited work-life balance, which can adversely impact their physical and mental health. A study by Kumar *et al*., (2022) [5] highlighted that nearly 60% of research scholars in India report moderate to high levels of stress, primarily due to workload, tight deadlines, and uncertainties regarding career prospects. Furthermore, Singh *et al*., (2020) [6] observed that limited access to adequate research infrastructure and resources contributes to feelings of frustration and dissatisfaction, further lowering QoL scores.

Need of the study

This Study is conducted for the holistic view highlights the importance of maintaining balance across multiple life dimensions to ensure a high quality of life (Khan, 2018). The demanding requirements of academic programmes frequently upset this healthy balance for research scholars, especially in India, resulting in severe stress and a decline in wellbeing (Shankar & Park, 2016) [21]. According to studies, workload, deadlines, and uncertain career prospects cause moderate to high levels of stress for about 60% of Indian research researchers (Kumar *et al*., 2022) [19]. Their quality of life is further diminished by restricted access to research resources, which intensifies frustration (Singh *et al*., 2020) [22]. Research scholars' well-being is often neglected despite their vital role in knowledge advancement, which emphasises the need for targeted evaluation and interventions to enhance their health-related quality of life (Schmidt & Hansson, 2018) [20]. In order to create a nurturing academic atmosphere that supports students' well-being and institutional performance, it is imperative that these issues be addressed.

Methodology

The study was conducted at Dayalbagh Educational Institute, Agra. An exploratory research design was employed, adopting a quantitative research approach. Data collection was carried out using the survey method to gather the required information. The study lasted three months to ensure enough time for data collection and analysis.
A total of 200 research scholars were selected as participants, divided equally by gender into two categories: 100 male research scholars and 100 female research scholars.
The sample size for the study was determined using Rao software Sample Size Calculator, a widely used online tool for calculating appropriate sample sizes in survey-based research. A confidence level of 95% and a margin of error of 0.5% were set as parameters, which are considered acceptable standards for ensuring data reliability and accuracy in social science research.



Criteria of simple selection

Inclusion criteria

- PhD scholars who have completed at least one year of their PhD to ensure adequate exposure to the academic environment.
- Willingness and interest.

Exclusion criteria

- PhD Research Scholars on academic leave or who have suspended their study.
- PhD Research Scholars with chronic health condition unrelated to PhD stressors (to control for confounding variable).

Results

- **Socio-demographic profile**

The Socio-demographic data provides clear insights into the age, marital status, eating habits, and Body Mass Index (BMI) of male and female participants.

		Male	Female
Age	21-25-year-old	34	33
	26-30-year-old	58	54
	>30-year-old	8	13
Marital status	Marrried	12%	32%
	Unmarried	88%	68%
Eating preferences	Vegetarian	12%	37%
	Non-vegtarian	32%	21%
	Lacto-vegetarian	56%	42%
BMI	Under-weight	8%	8%
	Normal	12%	18%
	Obese	68%	54%
	Over-weight	12%	18%

In age category, most individuals fall in the 26-30 age group, with 58 males and 54 females. The 21-25 age group includes 34 males and 33 females, while only 8 males and 13 females are over 30.
Marital status shows notable differences between genders. Among males, 12% are married, and 88% are unmarried. For females, 32% are married, and 68% are unmarried, indicating more single males compared to females in the study.

Eating preferences also vary between genders. Vegetarian diets are followed by 12% of males and 37% of females, while 32% of males and 21% of females follow non-vegetarian diets. Most individuals follow a lacto-vegetarian diet, with 56% of males and 42% of females preferring this option. In these results, vegetarians are defined as people who eat plant-based foods and may include dairy and/or eggs, but avoid meat, poultry, and fish. A non-vegetarian consumes meat, fish, or poultry, while a lacto-vegetarian includes dairy products but excludes eggs, meat, and fish.

BMI data reveals differences in weight categories. The proportion of underweight individuals is equal for both genders at 8%. However, more females (18%) than males (12%) have a normal BMI. Obesity is higher in males, with 68% obese compared to 54% of females. Overweight individuals include 12% of males and 18% of females.

- **Gender wise sf- 36 health score**

Fields	0-25		26-50		51-75		76-100	
	Male	Female	Male	Female	Male	Female	Male	Female
Physical health	40	31	14	32	14	17	32	20
General health	0	7	36	36	58	44	6	13
Physical functioning	18	17	34	38	18	21	30	24
Emotional problem	14	21	42	27	14	26	30	26
Emotional well being	6	6	36	24	50	45	8	25
Social functioning	8	11	46	39	36	35	10	15
Pain	4	14	14	27	58	27	24	32
Energy/ fatigue	2	10	54	34	40	48	4	8

The SF-36 health score data presented provides a gender-wise analysis across eight health domains, categorized into four performance levels: poor (0-25), average (26-50), good (51-75), and excellent (76-100). The SF-36 health score data highlights differences in health outcomes between males and females across various health domains.

In physical health, a higher percentage of males scored in the excellent category (32%) compared to females (20%). However, more females fell into the poor and average categories, suggesting that women tend to have lower physical health outcomes overall.

In general health, most individuals of both genders scored in the good category. Males had a higher proportion in this range (58%) compared to females (44%). However, females showed a wider spread across categories, with more individuals in both the poor and excellent categories, indicating a broader range of general health perceptions among women.

For physical functioning, females were more frequently in the average category (38%) than males (34%). Males, on the other hand, had slightly higher percentages in the good (18%) and excellent (30%) categories, pointing to better physical capabilities in men.

The emotional problem domain showed a clear contrast. Males were mostly in the average (42%) and excellent (30%) categories, while females were spread more evenly across all categories. This distribution may suggest that women experience greater emotional variability or challenges.

In emotional well-being, males had the highest proportion in the good category (50%), but females had a stronger presence in the excellent category (25%). This indicates that while men often have stable emotional health, women may experience higher levels of well-being in some cases.

In social functioning, both genders were mainly in the average and good categories. However, males had a slightly higher percentage in the excellent category (15% compared to 10% for females), indicating somewhat better social functioning.

The pain domain revealed a significant difference. Most males (58%) were in the good category, while females had a more even distribution, with notable percentages in the average and excellent categories. This suggests that women may experience more variability in their pain levels.

Lastly, in the energy/fatigue domain, males were mostly in the average and good categories. Although females had a similar percentage in the good category (48%), they showed higher proportions in both the poor and excellent categories, indicating greater variability in their energy levels.

In summary, males tend to score higher in physical health and functional areas, while females show more variability across categories, particularly in emotional, social, and energy-related domains.

- **Assessing the gender difference in QoL through mean and SD among research scholars**

Fields	Male	Female
	Mean + SD	Mean + SD
Physical health	57.69 ± 34.49	52.58 ± 32.13
General health	56.82 ± 14.68	56.95 ± 18.94
Physical functioning	56.25 ± 27.73	54.65 ± 25.59
Emotional problem	52.55 ± 35.76	52.87 ± 36.50
Emotional well being	54.15 ± 16.45	60.96 ± 16.51
Social functioning	57.93 ± 19.49	57.17 ± 21.20
Pain	63.60 ± 20.83	59.88 ± 24.58
Energy/ fatigue	53.26 ± 15.23	54.25 ± 16.14
TOTAL	56.53 ± 23.08	56.16 ± 23.94

The study evaluated the mean scores and standard deviations (SD) of various health domains for male and female participants. In terms of physical health, males exhibited a slightly higher mean score (57.69 ± 34.49) compared to females (52.58 ± 32.13). The mean scores for general health were nearly identical, with males scoring 56.82 ± 14.68 and females 56.95 ± 18.94. For physical functioning, males again had a slightly higher score (56.25 ± 27.73) compared to females (54.65 ± 25.59). Regarding emotional problems, the scores were almost equal, with males scoring 52.55 ± 35.76 and females 52.87 ± 36.50.

Interestingly, females reported higher scores in emotional well-being (60.96 ± 16.51) compared to males (54.15 ± 16.45). In social functioning, males scored marginally higher (57.93 ± 19.49) compared to females (57.17 ± 21.20). Regarding pain, males had a higher mean score (63.60 ± 20.83) than females (59.88 ± 24.58). In terms of energy and fatigue, females reported slightly higher scores (54.25 ± 16.14) compared to males (53.26 ± 15.23). Overall, the total mean scores were very similar, with males scoring 56.53 ± 23.08 and females scoring 56.16 ± 23.94, indicating minimal differences in the overall health perception across genders.

Discussion

Assessing students' health-related quality of life has been made possible through the use of standardised instruments like the SF-36 questionnaire. According to the findings, stress, anxiety, and burnout are prevalent issues, and mental health scores are typically lower than physical health scores (Patel *et al*., 2021) [9]. Social expectations and a dearth of institutional support networks exacerbate these difficulties, especially for female students and those from under-represented groups. To enhance the general well-being and productivity of research scholars in India, interventions like financial aid, mental health support, and mentorship programs have been suggested.

Since research reveals serious issues with mental health, stress, and academic pressure, the general health and quality of life of PhD students in India have become crucial areas of concern. Research shows that a significant percentage of Indian PhD students suffer from high levels of stress, anxiety, and depression as a result of their demanding coursework, uncertain financial futures, and tense interactions with their supervisors (Levecque *et al*., 2017) [11].

Nearly 68% of PhD students at two public universities in Kerala reported having depression of some kind, with 27% reporting moderate-to-severe symptoms, according to a study done there (Thomas & Mathew, 2021) [15]. Within prestigious universities like the Indian Institute of Technology (IIT) Kanpur, where 80% of PhD students reported mental health issues and 60% were considering ending their research programs, similar patterns were noted (Singh & Sharma, 2023) [13]. Financial instability, a lack of institutional support, and instances of caste and favouritism in academic settings are some of the factors causing these problems (Kumar & Raj, 2022) [10].

Despite these obstacles, some research indicates that personal qualities like grit, resilience, and harmony can greatly enhance doctorate students' wellbeing. According to a recent study, students who possess greater psychological capital are more likely to stay involved and content with their research experience (Patel & Mehta, 2023) [12]. Strong peer support networks and mentorship have also been found to be protective factors that can reduce mental health burdens and improve research productivity (Sverdlik *et al*., 2018) [14].

Conclusion

The Quality of Life (QoL) of PhD scholars in India plays a crucial role in determining their academic performance, mental well-being, and overall research output. Pursuing a PhD is a demanding process, often characterized by high levels of stress, long working hours, and financial constraints, all of which can significantly impact scholars' productivity and psychological health (Kumar & Sharma, 2021) [17]. A good QoL ensures that researchers remain motivated, resilient, and capable of producing high-quality work.

One of the key factors affecting QoL in Indian research is work-life balance. Many PhD scholars struggle with excessive workloads, lack of structured guidance, and insufficient funding, which can lead to burnout and mental health issues (Gupta *et al*., 2022) [16]. Moreover, the pressure to publish in high-impact journals and secure research grants further adds to their stress. Providing better financial support, mentorship programs, and mental health resources can help improve scholars' well-being, ultimately enhancing research quality and innovation.

Another significant aspect of QoL is the research environment. Indian universities and research institutions must foster a supportive and collaborative atmosphere where scholars feel valued and encouraged. Factors such as access to well-equipped laboratories, opportunities for international collaboration, and constructive supervisor-student relationships contribute to a better academic experience (Rao & Mehta, 2020) [18].

Gender differences in eight domains are revealed by the SF-36 health score data. In terms of physical functioning, overall health, and physical health, men score higher. Women exhibit broader distributions across performance levels and greater variability, especially in emotional well-being, social functioning, pain, and energy. While women undergo more emotional and energy swings, men typically enjoy better physical and functional health. Male and female mean scores varied across a number of health domains. While women reported better emotional well-being and somewhat higher energy levels, men scored higher on measures of physical health, functioning, and pain. Gender differences in health perception were minimal, and overall mean scores were almost the same.

In conclusion, ensuring a high QoL for PhD scholars in India is not just beneficial for individual well-being but also for the advancement of research and academia. Institutions and policymakers must take proactive steps to address financial, psychological, and infrastructural challenges to create a more conducive research environment.

Limitations of the study

- This Study is only conducted in Agra city.
- The study was limited to research scholars from a single institution (Dayalbagh Educational Institute, Agra), restricting generalizability.
- Only PhD scholars with over one year of experience were included, excluding early-stage perspectives.
- The lack of qualitative data limits deeper understanding of individual lived experiences.

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