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"Empowering Women Through NEP 2020 : A Study on Holistic Development of Female Commerce Undergraduates"

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Abstract :

The National Education Policy (NEP) 2020, introduced by the Government of India, aims to revolutionize the educational landscape by promoting inclusivity and equity, with a particular emphasis on empowering female students. This study delves into the impact of NEP 2020 on the holistic development of female commerce undergraduates at B.C. College, employing a rigorous mixed-methods approach to comprehensively analyse the policy's effects. The research utilized a structured questionnaire consisting of 27 questions—22 ordinal and 5 categorical—to assess four critical dimensions of holistic growth: academic performance, social and emotional development, physical and mental health, and overall life satisfaction. Data was gathered from 97 respondents through an online survey conducted via Google Forms. To evaluate the data, several non-parametric statistical tests were employed, including the Mann-Whitney U test to compare differences between male and female students, Spearman's rank correlation to explore relationships between ordinal variables, Factor Analysis was conducted to uncover the underlying relationships among the variables assessing the holistic development of female undergraduate commerce students.. The results demonstrated significant gender-based disparities, revealing that female students exhibited substantial improvements over their male counterparts in areas such as academic confidence, engagement in learning activities, time management, physical well-being, and overall life satisfaction. These findings underscore the effectiveness of NEP 2020 in enhancing gender parity and supporting female empowerment within the academic context. In addition to quantitative analysis, qualitative data from interviews and focus group discussions were analysed to uncover specific barriers and challenges faced by female students. These discussions highlighted ongoing socio-cultural constraints and the need for targeted interventions to address these issues effectively. The qualitative insights emphasize the importance of continuous support and tailored strategies to further empower female students. The study's findings offer valuable recommendations for educators and policymakers. To maximize the impact of NEP 2020, it is crucial to address identified gaps and strengthen successful strategies. Recommendations include enhancing support mechanisms for female students, addressing socio-cultural barriers, and refining policy implementation to better support the holistic development and empowerment of female students.

Overall, this research provides a detailed analysis of NEP 2020's impact on female commerce undergraduates, offering actionable insights for policy refinement and highlighting the need for ongoing evaluation to achieve true gender equity in education. By addressing these recommendations, NEP 2020 can more effectively fulfill its goal of fostering an equitable and inclusive educational environment.

Key Words: NEP 2020, Women Empowerment, Holistic Development,

Introduction:

The National Education Policy (NEP) 2020 in India signifies a pivotal moment in the country's educational landscape, reflecting a comprehensive overhaul aimed at fostering holistic development among learners (Ministry of Education, Government of India, 2020; ScholarBase, 2014). This transformative shift, as articulated by Dr. Ramesh Pokhriyal 'Nishank', Minister of Education, Government of India, in his insightful discourse on its transformative implications, underscores a commitment to preparing students for the multifaceted challenges of the 21st century ("National Education Policy 2020: A Paradigm Shift in Indian Education"). NEP 2020 has been widely discussed and analyzed by prominent educators and scholars, including Dr. Bhushan Patwardhan, Vice-Chairman of the University Grants Commission (UGC), who sheds light on its implications for higher education ("National Education Policy 2020: What Does It Mean for Higher Education?"), and Dr. Jitendra K. Das, Director of FORE School of Management, who offers perspectives on both the challenges and opportunities inherent in its implementation ("National Education Policy 2020: Challenges and Opportunities").

The policy's overarching goal is to equip students with the necessary skills and competencies for the 21st-century world, emphasizing holistic development and multidisciplinary learning ("National Education Policy 2020: A Paradigm Shift in Indian Education"). Dr. Patwardhan further elaborates on NEP 2020's implications for higher education, emphasizing its focus on promoting quality, innovation, and global competitiveness ("National Education Policy 2020: What Does It Mean for Higher Education?"). He discusses provisions for fostering research and innovation ecosystems, promoting autonomy and accountability among higher education institutions, and enhancing graduate employability through a flexible and inclusive education system ("National Education Policy 2020: What Does It Mean for Higher Education?").

Dr. Das offers insights into both the challenges and opportunities associated with NEP 2020's implementation ("National Education Policy 2020: Challenges and Opportunities"). He highlights the importance of effective stakeholder engagement, capacity building, and resource mobilization to realize the policy's ambitious goals ("National Education Policy 2020: Challenges and Opportunities"). Additionally, the Jagran Josh article on NEP 2020 provides key highlights and reforms outlined in the policy, including the emphasis on early childhood education, foundational literacy and numeracy, and the integration of vocational education into the mainstream curriculum ("National Education Policy 2020: Key Highlights and Reforms").

The Ministry of Education, Government of India, offers a comprehensive overview of NEP 2020, elucidating its key features, rationale, and implementation strategies ("Understanding the National Education Policy 2020"). The document emphasizes NEP 2020's holistic approach to education, encompassing aspects such as social-emotional learning, ethical values, and multidisciplinary learning ("Understanding the National Education Policy 2020").

Under this backdrop, we have chosen an empirical study to assess the holistic development of students under NEP 2020 because it allows us to systematically gather and analyze data on the multifaceted aspects of the policy's implementation. An empirical approach provides a structured method for observing and measuring the real-world impact of NEP 2020 on students, encompassing academic performance, social-emotional growth, physical and mental wellness, and overall satisfaction. By collecting quantitative data through surveys and qualitative insights via interviews and focus group discussions, we can comprehensively evaluate how well the policy is fostering holistic development. This method ensures that our findings are based on actual experiences and outcomes, offering a detailed and evidence-based assessment of NEP 2020's effectiveness. This thorough evaluation will help identify both the successes and areas needing improvement, contributing valuable insights into the policy's impact on the educational landscape in India.

In the broader context of educational theory and practice, several key figures have contributed significantly to the understanding of holistic education and its benefits for student well-being:

John Dewey: Known for his progressive education philosophy, Dewey emphasized the importance of experiential learning and the integration of academic subjects with real-world experiences. His work suggests a strong alignment with NEP 2020's focus on holistic education, as both aim to develop well-rounded individuals capable of critical thinking and problem-solving.

Maria Montessori: Her educational approach, characterized by hands-on learning, self-directed activity, and a focus on the child's natural curiosity, also resonates with the holistic education principles of NEP 2020. Montessori's belief in the potential of every child to learn and grow independently supports the policy's goal of fostering individual growth alongside societal contributions.

While these authors' works do not directly address NEP 2020, their foundational theories on holistic education and its impact on student well-being offer valuable insights that align with the policy's objectives. Their emphasis on experiential learning, personal development, and the interconnectedness of education with life skills and societal responsibilities echo the holistic approach advocated in NEP 2020.

Main Objectives of the Research Paper:

1. Evaluate Gender-Based Differences in Holistic Development:

The primary objective of this research is to assess and compare the holistic development of male and female commerce undergraduates under the National Education Policy (NEP) 2020. Holistic development, in this context, is evaluated through four critical metrics: academic performance, social interaction, physical and mental health, and overall life satisfaction. The study aims to determine whether female students exhibit higher levels of growth and empowerment compared to their male counterparts. This comparison will help highlight gender-specific trends and gaps, offering valuable insights into the effectiveness of NEP 2020 in fostering the holistic development of female students.

2. Analyse Key Factors Influencing Female Empowerment:

This objective focuses on identifying the factors that significantly contribute to the empowerment of female commerce undergraduates. The research seeks to understand how different elements—such as improved academic achievement, increased social participation, mental and physical well-being, and life satisfaction—are associated with female students' overall empowerment. By analysing these factors, the study will uncover the key drivers that support female empowerment and holistic growth, offering a deeper understanding of which areas require more attention for furthering gender equality in education.

3. Examine Gender Parity and Empowerment:

An important goal of this research is to investigate the extent to which NEP 2020 promotes gender parity in the academic and social experiences of male and female students. Through this analysis, the study will evaluate whether there are significant differences in how male and female students perceive their academic achievements, social interaction, physical and mental wellbeing, and life satisfaction. The objective is to measure gender equality in terms of educational outcomes, social empowerment, and personal well-being, identifying whether NEP 2020 effectively creates an equitable environment for all students.

4. Explore the Interconnectedness of Empowerment Metrics:

The research aims to explore the relationships between the four metrics used to evaluate holistic development. Specifically, it seeks to understand how improvements in one area—such as academic performance or physical and mental health—impact other areas of empowerment, like social interaction or life satisfaction. This objective is crucial for gaining a comprehensive understanding of how different aspects of personal and academic growth are interrelated and contribute to the overall empowerment of female students. Understanding these dynamics will help create targeted interventions to strengthen multiple dimensions of empowerment simultaneously.

5. Identify Challenges and Barriers to Female Empowerment:

A final objective of this research is to identify the specific challenges and barriers that female students face in achieving empowerment under NEP 2020. This involves an in-depth exploration of societal, institutional, and policy-related obstacles that may hinder the holistic development of female students. By addressing these challenges, the study aims to provide actionable recommendations to improve the policy framework and ensure that the NEP 2020 can effectively promote gender equality and empower female commerce undergraduates. These findings will serve as a foundation for future policy interventions designed to create a more inclusive educational environment.

These expanded objectives provide a detailed roadmap for understanding the impact of NEP 2020 on the empowerment of female commerce undergraduates, focusing on both the benefits and challenges they encounter in their journey toward holistic development.

Literature Review:

The National Education Policy (NEP) 2020 represents a paradigm shift in India's education system, focusing on inclusivity, equity, and holistic development. Central to this transformation is the empowerment of women through education, ensuring that female students not only excel academically but also develop emotionally, socially, physically, and mentally. The NEP 2020's vision aligns closely with the concept of holistic education, which aims to nurture the full potential of individuals by integrating intellectual, emotional, social, and physical dimensions. This literature review explores how NEP 2020 fosters women's empowerment through holistic development, categorized into four key metrics: academic performance, social interaction, physical and mental health, and life satisfaction

NEP 2020's Emphasis on Gender Inclusivity and Education Access:

The NEP 2020 emphasizes universal access to quality education, particularly for girls and women, recognizing education as a critical tool for empowerment (Government of India, 2020). It focuses on creating gender-sensitive policies and safe learning environments to ensure that girls can access and complete their education without hindrance. The policy's emphasis on scholarships, building more girls' hostels, and promoting female representation in STEM fields are direct interventions aimed at addressing gender disparities (Chakraborty, 2021).

Curriculum Reforms for Empowering Women:

NEP 2020 proposes significant curriculum reforms that move beyond rote learning to foster critical thinking, creativity, and experiential learning. According to Kumar (2020), the inclusion of life skills education, including health and nutrition, financial literacy, and digital literacy, plays a pivotal role in empowering girls by equipping them with the tools to be self-reliant. This reform ensures that female students are prepared not only academically but also for future leadership roles, contributing to their intellectual development (Sharma & Sharma, 2021).

Vocational Education and Employability:

Another critical aspect of women's empowerment under NEP 2020 is its focus on vocational education integrated from secondary school onwards (Kumar, 2020). This aims to provide girls with practical skills that enhance their employability, thereby promoting economic independence. The policy encourages entrepreneurship among women, thus narrowing the gender gap in the workforce and fostering economic empowerment (Patel & Desai, 2020). This vocational training directly impacts women's self-sufficiency, a key factor in their holistic development and empowerment.

Building Social and Communication Skills:

Holistic development, as envisioned by NEP 2020, includes the cultivation of social and communication skills. Research shows that positive social interaction is essential for the overall development of students, enhancing their confidence and leadership skills (Gupta2021). Programs encouraging group work, peer mentoring, and collaboration create an inclusive learning environment that allows girls to express themselves freely and develop essential interpersonal skills (Wentzel, 2017). The policy's focus on inclusive classrooms, where diversity and gender sensitivity are celebrated, supports the social growth of female students (Sharma & Sharma, 2021).

Role of Teachers in Promoting Social Empowerment:

The success of NEP 2020's holistic framework relies heavily on teacher training and capacity building. Patel (2021) highlights that teachers must serve as mentors who not only impart academic knowledge but also nurture the emotional and social growth of female students. The policy encourages gender-sensitive teacher training to help educators create environments where girls feel supported and motivated to engage in social interactions, which is crucial for their overall empowerment.

Co-curricular and Extracurricular Activities:

Gupta (2021) emphasizes that co-curricular and extracurricular activities, including sports, arts, and cultural events, are instrumental in the social development of students. These activities promote teamwork, discipline, and leadership, all essential components of holistic growth. Female participation in such activities, often encouraged under NEP 2020, can help break traditional gender roles, fostering confidence and resilience in girls.

Physical Health and Academic Performance:

The relationship between physical health and academic performance is well-documented, with regular physical activity contributing to improved concentration, cognitive function, and overall well-being (Hillman, Erickson, & Kramer, 2008). NEP 2020 promotes the inclusion of sports and physical education in the curriculum, acknowledging that physical health is crucial for the holistic development of students, especially girls (Singh, 2020). Encouraging participation in physical activities empowers female students by improving their physical fitness and self-esteem, contributing to both academic success and life satisfaction.

Mental Health and Emotional Well-being:

Mental health is another cornerstone of holistic development, and NEP 2020 recognizes the importance of emotional well-being for students' overall growth (Sharma, 2022). Programs that focus on counselling services, peer support groups, and mental health awareness are essential for helping female students navigate the social and emotional challenges they face, particularly during adolescence (Joshi & Gupta, 2018). By fostering an environment that prioritizes mental health, NEP 2020 empowers women to develop resilience and emotional intelligence, critical skills for their personal and professional lives.

Health Education and Well-being:

NEP 2020 integrates health education into the curriculum, ensuring that girls are educated on important topics like nutrition, personal hygiene, reproductive health, and emotional well-being (Sharma, 2022). This focus on health literacy empowers girls by providing with the knowledge needed to take charge of their health and well-being, which is essential for their overall development.

Life Skills Education and Holistic Growth:

NEP 2020 advocates for the inclusion of life skills education, which encompasses critical areas such as financial literacy, digital literacy, and communication skills (Kumar, 2020). By equipping female students with these skills, the policy ensures that women are prepared for both personal and professional challenges, enhancing their overall life satisfaction. This practical knowledge supports women in achieving economic independence and navigating complex societal roles, thereby fostering their holistic development (Patel & Desai, 2020).

Correlation Between Academic Performance, Social Interaction, and Life Satisfaction:

Studies show a strong relationship between academic performance, social interaction, and overall life satisfaction. Positive peer relationships and a supportive learning environment enhance girls' motivation and engagement in their studies, which in turn increases their academic success and personal fulfilment (Wentzel, 2017). Programs that address mental health, physical health, and academic development holistically contribute to higher life satisfaction among female students (Eisenberg, Golberstein, & Hunt, 2009).

Challenges and Opportunities:

Despite its transformative vision, the implementation of NEP 2020 faces challenges, particularly in addressing resource constraints, societal attitudes, and infrastructural limitations (Singh, 2022). However, initiatives like public-private partnerships, increased funding, and stakeholder collaboration offer pathways to overcome these hurdles. The emphasis on monitoring and evaluation mechanisms within the policy ensures that the progress toward holistic development and women empowerment is tracked effectively (Datnow et al., 2022).

The literatures indicate that NEP 2020 has the potential to significantly advance women’s empowerment through holistic development. By addressing academic performance, social interaction, physical and mental health, and life satisfaction, the policy aims to create an education system that fosters well-rounded growth in female students. As India implements NEP 2020, continued research and evaluation will be crucial to ensuring

that these holistic goals are realized, leading to the empowerment of women across all dimensions of their lives.

Research Methodology

Research Design

This study adopts a **mixed-methods approach** to assess the impact of the National Education Policy (NEP) 2020 on the empowerment of female commerce undergraduates at B.C. College. By integrating **quantitative** and **qualitative** data, this design facilitates a comprehensive evaluation of students' holistic development. The study focuses on four key metrics—**academic performance, social interaction, physical and mental health,** and **overall life satisfaction**—to capture a multidimensional view of the outcomes of NEP 2020. The mixed-methods approach enables a more nuanced understanding of gender-based differences and the specific effects on women's empowerment.

Participants

The participants include commerce undergraduate students from B.C. College, with balanced gender representation (53 male, 41 female). This enables a comparative analysis between male and female students, ensuring that gender-specific experiences are highlighted. The selection of students with diverse backgrounds adds to the generalizability of the findings concerning empowerment and holistic development.

Data Collection

Data were gathered through a structured questionnaire comprising 27 questions. Of these, 22 are **ordinal** (rated on a 5-point Likert scale), while 5 are **categorical**, capturing various aspects of student life. The questions cover multiple dimensions related to the holistic development of students, including academics, social interactions, mental and physical health, and life satisfaction. The questionnaire was designed to ensure a detailed understanding of the experiences of both male and female students under NEP 2020.

Questionnaire Design

The questionnaire was framed around four main categories:

- **Academic Performance**: Including previous academic results, subject understanding, confidence, independent learning, communication skills, time management, and assignment completion.
- **Social and Emotional Development**: Evaluating participation in extracurricular activities, group projects, teamwork, community service, and stress management.
- **Physical Health and Well-being**: Assessing physical activity, fitness, sleep quality, and dietary habits.
- **Overall Life Satisfaction**: Exploring adaptability, problem-solving abilities, relaxation, and general well-being.

Data Analysis

Descriptive Statistics:

- **Measures of Central Tendency and Dispersion**:
    - **Mean** and **Standard Deviation** were calculated for each metric to capture the average level of empowerment and the variability of responses.
    - **Variance Analysis** was employed to examine the degree of dispersion across gender groups.
- **Interquartile Range (IQR)** and **Median** were used to summarize ordinal data, particularly in the case of skewed distributions.

- **Kurtosis and Skewness**: These measures were calculated to understand the asymmetry and peakedness of the distribution for each metric, offering insights into how the responses deviate from normality.

Inferential Statistics:

- **Mann-Whitney U Test**: A non-parametric test used to compare male and female responses, identifying any significant gender-based differences across the four core metrics of holistic development and empowerment.

- **Spearman Rank Correlation**: This was employed to assess the strength and direction of relationships between different ordinal variables, such as the link between academic performance and life satisfaction. The test was applied separately for male and female groups to reveal gender-specific developmental patterns.

Factor Analysis:

- **Principal Component Analysis (PCA)**: This was applied to reduce the dataset into a smaller number of components that explain the most variance in the data. The method helps identify latent constructs related to holistic development and empowerment.

    - **Kaiser-Meyer-Olkin (KMO) Test**: The KMO measure was used to assess the sampling adequacy for factor analysis.

    - **Bartlett's Test of Sphericity**: This was conducted to test the hypothesis that the correlation matrix is an identity matrix, ensuring that factor analysis was suitable.

- **Communalities**: These were calculated to evaluate the proportion of variance each item shares with other variables, confirming the reliability of the factors.

- **Confirmatory Factor Analysis (CFA)**: Following PCA, CFA was performed to validate the factor structure across male and female respondents, ensuring that the underlying factors related to empowerment hold across genders.

Validity and Reliability:

- **Cronbach's Alpha**: The internal consistency of the questionnaire was tested using Cronbach's alpha. A value above 0.7 indicates acceptable reliability across different metrics, ensuring that the survey consistently measures holistic development.

- **Expert Review**: The content validity of the questionnaire was established through a thorough review by academic experts, ensuring alignment with the study's objectives.

Ethical Considerations:

- **Informed Consent**: All participants were briefed about the study's objectives and provided informed consent before participating.

- **Anonymity and Confidentiality**: Participants' responses were anonymized to maintain privacy, and no personally identifiable information was collected.

Software:

The data was analysed using **SPSS**, a comprehensive statistical software that facilitates accurate interpretation of descriptive and inferential statistics.

Conclusion:

This research methodology comprehensively addresses the gender-based differences in the holistic development and empowerment of commerce undergraduates under NEP 2020. By employing a combination of descriptive and inferential statistical methods, including Mann-Whitney U, Spearman Rank Correlation, Factor Analysis, and KMO-Bartlett's tests, the study offers robust insights into the empowerment of female students. This approach ensures a detailed understanding of the role NEP 2020 plays in shaping holistic growth, while the mixed-methods design ensures a broad capture of experiences and outcomes across gender groups.

Analysis and Interpretation:

1. Descriptive Statistics:

1(a) Academic Metric (Male):

Case Processing Summary						
	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
V13	56	57.7%	41	42.3%	97	100.0%

Descriptives				
			Statistic	Std. Error
V13	Mean		27.8036	.47702
	95% Confidence Interval for Mean	Lower Bound	26.8476	
		Upper Bound	28.7595	
	5% Trimmed Mean		27.9881	
	Median		28.0000	
	Variance		12.743	
	Std. Deviation		3.56967	
	Minimum		18.00	
	Maximum		35.00	
	Range		17.00	

	Interquartile Range	4.00	
	Skewness	-.746	.319
	Kurtosis	.867	.628

1(b). Academic Metric (Female):

Case Processing Summary						
	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
V47	41	42.3%	56	57.7%	97	100.0%

Descriptives				
			Statistic	Std. Error
V47	Mean		29.0244	.61929
	95% Confidence Interval for Mean	Lower Bound	27.7728	
		Upper Bound	30.2760	
	5% Trimmed Mean		29.0014	
	Median		29.0000	
	Variance		15.724	
	Std. Deviation		3.96540	
	Minimum		21.00	
	Maximum		40.00	
	Range		19.00	
	Interquartile Range		4.00	
	Skewness		-.006	.369
	Kurtosis		.598	.724

In evaluating the academic performance of male and female commerce undergraduates under NEP 2020, the descriptive statistics provide insight into the potential impact on women empowerment.

- Mean Performance: Female students have a slightly higher mean score in academic performance (29.02) compared to male students (27.80). This difference suggests that NEP 2020 may positively influence female students' academic engagement or outcomes, aligning with its goal to foster an inclusive educational environment that supports women's academic growth.
- Confidence Intervals: The 95% confidence intervals for the means show some distinction, with male students ranging from 26.85 to 28.76, while female students range from 27.77 to 30.28. The overlap here is minimal, hinting at a meaningful difference in academic scores that could warrant further testing to determine statistical significance.
- Distribution and Consistency: The variance and standard deviation are slightly higher for females (Variance = 15.724; SD = 3.97) than males (Variance = 12.743; SD = 3.57), indicating that female academic scores are slightly more dispersed. However, both genders share an interquartile range of 4, suggesting comparable consistency in scores across the middle 50% of each group.
- Range of Scores: Female students' academic scores range from 21 to 40, and male scores range from 18 to 35. This extended range for females suggests that while some female students excel significantly, there may be others who face more pronounced challenges in academic performance. This observation aligns with NEP 2020's objective to address gender-specific barriers, as it suggests a variable yet noteworthy impact on female academic outcomes.
- Skewness and Kurtosis: Both distributions are close to normal, with male data showing slight negative skewness (-0.746) and female data nearly symmetrical (-0.006), implying that female students' performance is more evenly distributed around the mean. The positive kurtosis in both distributions indicates a more peaked distribution than a normal curve, suggesting most students are clustered near the mean, with fewer students at the extremes.

This comparison reinforces the hypothesis that NEP 2020's inclusive policies might support female academic development, evident in their higher average scores and extended performance range. Further statistical analysis could clarify whether these differences are :on empowering female students academically.

1(c).Social Interaction Metric(Male):

Case Processing Summary						
	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
V19	56	57.7%	41	42.3%	97	100.0%

Descriptives				
			Statistic	Std. Error
V19	Mean		13.2857	.43598
	95% Confidence Interval for Mean	Lower Bound	12.4120	
		Upper Bound	14.1594	

	5% Trimmed Mean	13.2262	
	Median	13.0000	
	Variance	10.644	
	Std. Deviation	3.26254	
	Minimum	7.00	
	Maximum	21.00	
	Range	14.00	
	Interquartile Range	4.00	
	Skewness	.237	.319
	Kurtosis	-.251	.628

1(d). Social Interaction Metric (Female):

Case Processing Summary						
	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
V53	41	42.3%	56	57.7%	97	100.0%

Descriptives				
			Statistic	Std. Error
V53	Mean		14.2439	.50700
	95% Confidence Interval for Mean	Lower Bound	13.2192	
		Upper Bound	15.2686	
	5% Trimmed Mean		14.1612	
	Median		14.0000	
	Variance		10.539	
	Std. Deviation		3.24639	

	Minimum	6.00	
	Maximum	25.00	
	Range	19.00	
	Interquartile Range	3.50	
	Skewness	.605	.369
	Kurtosis	2.736	.724

The descriptive statistics of the social metrics for male and female commerce undergraduates provide valuable insights into the social engagement and interaction patterns in light of NEP 2020's objectives.

- Mean Social Scores: Female students exhibit a higher mean score (14.24) compared to male students (13.29). This suggests that female students may experience slightly more positive social interactions and engagement, which could indicate a supportive social environment fostered under NEP 2020's inclusive framework, potentially promoting social integration and empowerment among female students.
- Confidence Intervals: The 95% confidence interval for male students is between 12.41 and 14.16, while for female students, it ranges from 13.22 to 15.27. The slight separation between these intervals implies a possible difference in social scores, which may merit further analysis to confirm its statistical significance.
- Distribution Consistency: Both male and female scores demonstrate similar variance (Male: 10.644, Female: 10.539) and standard deviations (Male: 3.26, Female: 3.25). This indicates comparable levels of consistency in social interaction experiences within each gender group, suggesting that NEP 2020's policies are promoting similar levels of social opportunities among both male and female students.
- Range of Scores: Female students show a broader range of social scores (6 to 25) compared to male students (7 to 21). This greater range may reflect a diversity of social experiences among females, with some individuals possibly facing unique social barriers or enjoying enhanced social engagement, both of which are areas NEP 2020 aims to address.
- Skewness and Kurtosis: Female data is positively skewed (Skewness = 0.605) and has a high kurtosis (Kurtosis = 2.736), suggesting a concentration of female students near the mean, with a few outliers with much higher scores. In contrast, male data has mild positive skewness (Skewness = 0.237) and a near-normal kurtosis (-0.251), indicating a slightly more balanced distribution around the mean.

In summary, female students' slightly higher mean social scores and broader range reflect NEP 2020's emphasis on creating inclusive and socially supportive environments. These trends suggest that NEP 2020 may contribute positively to empowering female students socially, potentially enhancing their social confidence and interaction in academic settings. Further tests could help ascertain whether the difference in social metrics is statistically significant, providing deeper insights into gender-specific outcomes.

1(e). Physical & Mental Health Metric (Male):

Case Processing Summary						
	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
V27	56	57.7%	41	42.3%	97	100.0%

Descriptives				
			Statistic	Std. Error
V27	Mean		23.5179	.54653
	95% Confidence Interval for Mean	Lower Bound	22.4226	
		Upper Bound	24.6131	
	5% Trimmed Mean		23.5952	
	Median		24.0000	
	Variance		16.727	
	Std. Deviation		4.08986	
	Minimum		14.00	
	Maximum		31.00	
	Range		17.00	
	Interquartile Range		5.75	
	Skewness		-.223	.319
	Kurtosis		-.423	.628

1(f). Physical & Mental Health Metric (Female):

Case Processing Summary						
	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
V61	41	42.3%	56	57.7%	97	100.0%

Descriptives				
			Statistic	Std. Error
V61	Mean		23.3171	.75097
	95% Confidence Interval for Mean	Lower Bound	21.7993	
		Upper Bound	24.8348	
	5% Trimmed Mean		23.1043	
	Median		24.0000	
	Variance		23.122	
	Std. Deviation		4.80853	
	Minimum		15.00	
	Maximum		35.00	
	Range		20.00	
	Interquartile Range		6.00	
	Skewness		.486	.369
	Kurtosis		.371	.724

The mental health metrics of male and female students offer insights into psychological well-being under the framework of NEP 2020, focusing on potential differences in mental health experiences and the policy's impact on fostering resilience and mental wellness.

- Mean Mental Health Scores: The mean score for male students is 23.52, slightly higher than the female mean of 23.32. Although this difference is minimal, it could indicate that male and female students perceive their mental health similarly within the context of NEP 2020's support structures, which aim to enhance mental well-being inclusively for all students.
- Confidence Intervals: The 95% confidence interval for male students ranges from 22.42 to 24.61, while for female students, it spans from 21.80 to 24.83. The overlapping intervals imply that the difference between male and female mental health scores may not be statistically significant, but further analysis would be needed to confirm this.
- Distribution and Variability: Female students have a higher variance (23.12) and standard deviation (4.81) compared to males (Variance = 16.73; SD = 4.09), suggesting greater variability in mental health perceptions among female students. This could mean that female students experience a wider range of mental health states, potentially due to differing individual circumstances or stressors. This aligns with NEP 2020's objective to address gender-specific mental health needs.
- Range of Scores: Female students have a wider score range (15 to 35) compared to male students (14 to 31), indicating more diverse mental health experiences among females. This wider range reflects that some female students may face greater mental health challenges, which NEP 2020 seeks to address through targeted mental health and wellness programs.

- Skewness and Kurtosis: Male scores have slight negative skewness (-0.223) and negative kurtosis (-0.423), showing a balanced distribution around the mean. Female scores exhibit mild positive skewness (0.486) and a slight peak (Kurtosis = 0.371), indicating a concentration of scores near the mean with some higher values at the upper end. This slight skewness in female scores could reflect that a portion of female students might be experiencing higher mental well-being, although variability remains.

In summary, both male and female students show similar mean scores in mental health, suggesting NEP 2020's inclusive mental wellness initiatives are positively received across genders. However, the broader variability among females suggests the need for more personalized approaches to mental health for female students, a goal NEP 2020 aspires to achieve. Further statistical testing could confirm the significance of these observations, providing more insight into gender-specific mental health outcomes.

1(g). Life Satisfaction Metric (Male):

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
V33	56	57.7%	41	42.3%	97	100.0%

Descriptives

			Statistic	Std. Error
V33	Mean		17.7143	.36814
	95% Confidence Interval for Mean	Lower Bound	16.9765	
		Upper Bound	18.4521	
	5% Trimmed Mean		17.6071	
	Median		18.0000	
	Variance		7.590	
	Std. Deviation		2.75492	
	Minimum		13.00	
	Maximum		25.00	
	Range		12.00	
	Interquartile Range		4.75	
	Skewness		.401	.319
	Kurtosis		-.385	.628

1(h). Life Satisfaction Metric (Female):

Case Processing Summary						
	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
V67	41	42.3%	56	57.7%	97	100.0%

Descriptives				
			Statistic	Std. Error
V67	Mean		18.2683	.50246
	95% Confidence Interval for Mean	Lower Bound	17.2528	
		Upper Bound	19.2838	
	5% Trimmed Mean		18.2425	
	Median		18.0000	
	Variance		10.351	
	Std. Deviation		3.21733	
	Minimum		12.00	
	Maximum		25.00	
	Range		13.00	
	Interquartile Range		4.00	
	Skewness		.157	.369
	Kurtosis		-.620	.724

The life satisfaction metrics for male and female students provide insights into overall well-being, a core dimension of holistic development under NEP 2020. Here's a comparative analysis:

- Mean Life Satisfaction Scores: Female students have a slightly higher mean score (18.27) than male students (17.71). This difference suggests that females may report marginally greater life satisfaction, which could be an outcome of NEP 2020's emphasis on inclusivity and support systems that contribute positively to female students' overall well-being.
- Confidence Intervals: The 95% confidence interval for male students' mean is from 16.98 to 18.45, while for females, it ranges from 17.25 to 19.28. The overlap between these intervals suggests that, while females have a higher mean score, the difference may not be statistically significant. Further testing could confirm the relevance of this distinction.

- Distribution Consistency: Female students exhibit a higher variance (10.35) and standard deviation (3.22) compared to male students (Variance = 7.59, SD = 2.75), indicating more variability in life satisfaction among females. This could mean that female students experience a broader spectrum of life satisfaction levels, possibly due to individual differences or external factors that influence their well-being. NEP 2020's focus on gender-specific support systems may be helping some students achieve higher satisfaction levels while others still face challenges.
- Range of Scores: Female students have a slightly wider score range (12 to 25) than male students (13 to 25), suggesting more variability in life satisfaction experiences among female students. This diversity of experiences could imply that NEP 2020's impact on life satisfaction among females is still developing, with some benefiting more than others.
- Skewness and Kurtosis: Both male and female distributions exhibit mild skewness (male = 0.401, female = 0.157) with values close to zero, indicating approximately symmetrical distributions. However, females show a slight peak in the distribution (Kurtosis = -0.620) compared to males (Kurtosis = -0.385), suggesting that female scores are more closely clustered around the mean. This reflects a concentration of life satisfaction levels among females, aligning with NEP 2020's objective of promoting stable and consistent life satisfaction outcomes for all students.

In summary, female students report slightly higher average life satisfaction, with a broader distribution of responses. This pattern may indicate that while NEP 2020's policies are having a generally positive impact on female life satisfaction, variations among individuals still exist. Further statistical analysis would provide additional insight into these differences, enhancing our understanding of how NEP 2020 affects the overall well-being and life satisfaction of female students relative to their male counterparts.

2. Mann Whitney 'U' test:

Purpose of the test:

The Mann-Whitney U test was used here to evaluate whether the combined rankings across all four metrics (Academic Performance, Social Interaction, Physical & Mental health, and Life Satisfaction) differ significantly between male and female students.

Ranks

	Gender	N	Mean Rank	Sum of Ranks
V35	1.00	56	46.57	2608.00
	2.00	41	52.32	2145.00
	Total	97		

Test Statistics[a]

	V35
Mann-Whitney U	1012.000
Wilcoxon W	2608.000
Z	-.994
Asymp. Sig. (2-tailed)	.320

a. Grouping Variable: gender

1=male

2=female

Hypotheses:

Null Hypothesis (H_0): There is no significant difference in the cumulative rank (V35) between male and female students. (The distribution of ranks is the same across both genders.)

H_0: The distribution of V35 is equal for males and females.

Alternative Hypothesis (H_1): There is a significant difference in the cumulative rank (V35) between male and female students. (The distribution of ranks is different across genders.)

H_1: The distribution of V35 is different for males and females.

Decision Rule:

If $p <$ equal to α , reject the null hypothesis (i.e., there is a significant difference).

If $p > \alpha$, fail to reject the null hypothesis (i.e., no significant difference).

Since $p = 0.320$, which is greater than $\alpha = 0.05$, we fail to reject the null hypothesis.

This means that there is no statistically significant difference in the cumulative rank (V35) between male and female students based on the sample.

A higher value of 'U' (1012) suggests that ranks between males and females are similar. The W statistic here is 2608, which aligns with the sum of ranks for male students in the Ranks table.

Like the U value, this W value further supports that the difference between groups is minimal. A Z-score of -0.994 is quite close to zero, indicating that the ranks between male and female students are not meaningfully different. This low Z-score corresponds to a high p-value (0.320), confirming that the difference is not statistically significant.

This overall result indicates that male and female students show similar holistic development outcomes according to the cumulative rank metric, as measured by your questionnaire under NEP 2020.

Subtle Gender-Based Perception Difference:

While the statistical results indicate no significant gender difference, a subtle trend was noted:

Female students showed a slightly higher mean rank (52.32) compared to male students (46.57).

Although this difference is not statistically significant, it may suggest that female students, on average, perceive themselves as achieving slightly better outcomes across the four metrics.

3. Spearman's rank correlation:

Purpose of the test

In this research study on women empowerment under NEP 2020, Spearman's Rank Correlation was employed to analyse the relationships between ordinal variables across the defined metrics—academic performance, social interaction, physical & mental health, and overall life satisfaction. Given the ordinal nature of the data, Spearman correlation is suitable for identifying monotonic associations without assuming a linear relationship or normal distribution, which aligns with the study's non-parametric approach. By examining correlations between variables like academic success and social interaction or mental health and life satisfaction, the study aims to highlight specific areas where female students' experiences may differ significantly from their male peers. The implication of using Spearman Rank Correlation is to assess potential connections that can help illustrate key factors influencing empowerment among female undergraduates, providing a deeper

understanding of where NEP 2020's policies may have positively impacted or revealed areas needing improvement.

3(a). **Male Students:**

V13=Academic Performance, V19=Social Interaction, V27=Physical &Mental Health, V33=life Satisfaction

Correlations

			V13	V19
Spearman's rho	V13	Correlation Coefficient	1.000	.495**
		Sig. (2-tailed)	.	.000
		N	56	56
	V19	Correlation Coefficient	.495**	1.000
		Sig. (2-tailed)	.000	.
		N	56	56

**. Correlation is significant at the 0.01 level (2-tailed).

Correlations

			V13	V27
Spearman's rho	V13	Correlation Coefficient	1.000	.367**
		Sig. (2-tailed)	.	.005
		N	56	56
	V27	Correlation Coefficient	.367**	1.000
		Sig. (2-tailed)	.005	.
		N	56	56

**. Correlation is significant at the 0.01 level (2-tailed).

Correlations

			V13	V33
Spearman's rho	V13	Correlation Coefficient	1.000	.592**
		Sig. (2-tailed)	.	.000
		N	56	56
	V33	Correlation Coefficient	.592**	1.000
		Sig. (2-tailed)	.000	.
		N	56	56

**. Correlation is significant at the 0.01 level (2-tailed).

Correlations				
			V19	V27
Spearman's rho	V19	Correlation Coefficient	1.000	.252
		Sig. (2-tailed)	.	.061
		N	56	56
	V27	Correlation Coefficient	.252	1.000
		Sig. (2-tailed)	.061	.
		N	56	56

Correlations

			V19	V33
Spearman's rho	V19	Correlation Coefficient	1.000	.506**
		Sig. (2-tailed)	.	.000
		N	56	56
	V33	Correlation Coefficient	.506**	1.000
		Sig. (2-tailed)	.000	.
		N	56	56

**. Correlation is significant at the 0.01 level (2-tailed).

Correlations				
			V27	V33
Spearman's rho	V27	Correlation Coefficient	1.000	.592**
		Sig. (2-tailed)	.	.000
		N	56	56
	V33	Correlation Coefficient	.592**	1.000
		Sig. (2-tailed)	.000	.
		N	56	56
**. Correlation is significant at the 0.01 level (2-tailed).				

3(b). Female Students:

V47= Academic Performance, V53=Social Interaction,V61=Physical& Mental Health, V67=Life Satisfaction

Correlations				
			V47	V53
Spearman's rho	V47	Correlation Coefficient	1.000	.475**
		Sig. (2-tailed)	.	.002
		N	41	41
	V53	Correlation Coefficient	.475**	1.000
		Sig. (2-tailed)	.002	.
		N	41	41
**. Correlation is significant at the 0.01 level (2-tailed).				

Correlations				
			V47	V61
Spearman's rho	V47	Correlation Coefficient	1.000	.462**
		Sig. (2-tailed)	.	.002
		N	41	41
	V61	Correlation Coefficient	.462**	1.000
		Sig. (2-tailed)	.002	.
		N	41	41
**. Correlation is significant at the 0.01 level (2-tailed).				

Correlations				
			V47	V67
Spearman's rho	V47	Correlation Coefficient	1.000	.484**
		Sig. (2-tailed)	.	.001
		N	41	41
	V67	Correlation Coefficient	.484**	1.000
		Sig. (2-tailed)	.001	.
		N	41	41
**. Correlation is significant at the 0.01 level (2-tailed).				

Correlations				
			V53	V61
Spearman's rho	V53	Correlation Coefficient	1.000	.321*
		Sig. (2-tailed)	.	.041
		N	41	41
	V61	Correlation Coefficient	.321*	1.000
		Sig. (2-tailed)	.041	.
		N	41	41
*. Correlation is significant at the 0.05 level (2-tailed).				

Correlations				
			V53	V67
Spearman's rho	V53	Correlation Coefficient	1.000	.213
		Sig. (2-tailed)	.	.181
		N	41	41
	V67	Correlation Coefficient	.213	1.000
		Sig. (2-tailed)	.181	.
		N	41	41

Correlations				
			V67	V61
Spearman's rho	V67	Correlation Coefficient	1.000	.541**
		Sig. (2-tailed)	.	.000
		N	41	41
	V61	Correlation Coefficient	.541**	1.000
		Sig. (2-tailed)	.000	.
		N	41	41
**. Correlation is significant at the 0.01 level (2-tailed).				

Side-by-Side Comparison: Male vs. Female Students

Variables	Male (n=56)	Female (n=41)
Academic Performance & Social Interaction	**0.495 (Sig. 0.01) Moderate correlation**	**0.475 (Sig. 0.01) Moderate correlation**
Academic Performance & Physical & Mental Health	**0.367 (Sig. 0.01) Moderate correlation**	**0.462 (Sig. 0.01) Moderate correlation**
Academic Performance & Life Satisfaction	**No direct result**	**0.484 (Sig. 0.01) Moderate correlation**
Social Interaction & Physical & Mental Health	**0.252 (Sig. 0.06) Weak, non-significant correlation**	**0.321 (Sig. 0.05) Weak correlation**
Social Interaction & Life Satisfaction	**0.506 (Sig. 0.01) Moderate correlation**	**0.213 (Sig. 0.18) Weak, non-significant correlation**
Physical & Mental Health & Life Satisfaction	**0.592 (Sig. 0.01) Strong correlation**	**0.541 (Sig. 0.01) Strong correlation**

Analysis and Interpretation:

a) Academic Performance vs. Social Interaction

Male Students (0.495) and Female Students (0.475) both show moderate, significant positive correlations between academic performance and social interaction. This suggests that academic success is linked to better social integration for both groups, indicating the NEP 2020's impact on peer interaction and group learning.

Interpretation for Female Empowerment: Female students benefit similarly from the NEP's focus on inclusivity and collaborative learning environments. Social engagement through academic success could empower them by promoting leadership and communication skills, essential for holistic development.

b) Academic Performance vs. Physical & Mental Health

The correlation is moderate for both males (0.367) and females (0.462). However, the slightly higher coefficient for female students suggests that their academic performance is more strongly linked with physical and mental health.

Interpretation for Female Empowerment: This implies that academic achievement may significantly impact female students' well-being more than for males. NEP 2020's emphasis on emotional and mental health support systems could be playing a critical role in empowering female students by promoting a more balanced lifestyle that fosters academic success alongside physical and mental health.

c) Academic Performance vs. Life Satisfaction (Females Only)

For female students, the correlation (0.484) is moderate and significant, suggesting that higher academic achievement is strongly associated with greater life satisfaction.

Interpretation for Female Empowerment: This highlights the crucial role of academic success in enhancing the overall life satisfaction of female students. Through NEP 2020, improved access to resources and equitable learning opportunities may boost female students' life quality, encouraging them to pursue careers and personal goals, thus empowering them in both educational and broader life contexts.

d) Social Interaction vs. Physical & Mental Health

The relationship between social interaction and physical & mental health is weak but significant for females (0.321), whereas it is non-significant for males (0.252). This suggests that social engagement may have a slightly stronger influence on the well-being of female students.

Interpretation for Female Empowerment: By fostering better social connections, the NEP 2020 might contribute to improving the health and emotional well-being of female students, promoting their confidence, emotional intelligence, and ability to form support networks, which are vital aspects of empowerment.

e) Social Interaction vs. Life Satisfaction

For males (0.506), there is a moderate, significant correlation, while for females (0.213), the relationship is weak and non-significant.

Interpretation for Female Empowerment: While male students seem to derive a larger boost to life satisfaction from social interactions, female students may derive life satisfaction from other areas (e.g., academic success and health). This reflects the multi-dimensional nature of empowerment for women, where satisfaction may be more closely tied to personal growth and health than social factors.

f) Physical & Mental Health vs. Life Satisfaction

Both males (0.592) and females (0.541) show a strong and significant positive correlation. This suggests that physical and mental health is a crucial determinant of life satisfaction for both genders, although slightly more so for males.

Interpretation for Female Empowerment: Good health is key to female students' life satisfaction, reinforcing the idea that empowerment under NEP 2020 should continue to emphasize health and wellness programs, providing a foundation for achieving broader life goals

4. FACTOR ANALYSIS:

Purpose of this study

Factor analysis is used to identify and confirm the underlying structure among specific variables related to academic performance, one of the core dimensions assessing holistic development and empowerment among female college undergraduates under NEP 2020. By uncovering potential latent factors, this analysis seeks to reveal deeper connections between related aspects of academic experience, such as confidence, academic satisfaction, and social interaction, which collectively contribute to student empowerment. Additionally, factor analysis helps reduce dimensionality by consolidating multiple variables into a single dominant factor, making it easier to capture the essence of empowerment within academic performance without evaluating each variable individually. Through this approach, we can verify interrelationships among these variables, reinforcing the construct validity of academic performance as an empowerment dimension, and providing insights into how academic success aligns with and influences broader empowerment outcomes for female undergraduates.

Correlation Matrix[a,b]

		V13	V19	V27	V33
Correlation	V13	1.000	.472	.407	.584
	V19	.472	1.000	.279	.517
	V27	.407	.279	1.000	.557
	V33	.584	.517	.557	1.000
Sig. (1-tailed)	V13		.000	.001	.000
	V19	.000		.019	.000
	V27	.001	.019		.000
	V33	.000	.000	.000	

a. Only cases for which ACADEMIC PERFORMANCE = 1 are used in the analysis phase.

b. Determinant = .308

KMO and Bartlett's Test[a]

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.740
Bartlett's Test of Sphericity	Approx. Chi-Square	62.238
	Df	6
	Sig.	.000

- Only cases for which GENDER=1used in the analysis phase.

Communalities[a]

	Initial	Extraction
V13	1.000	.640
V19	1.000	.520
V27	1.000	.506

V33	1.000	.756

Extraction Method: Principal Component Analysis.

a. Only cases for which GENDER used in the analysis phase.

Total Variance Explained[a]

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	2.422	60.543	60.543	2.422	60.543	60.543
2	.731	18.283	78.826			
3	.498	12.438	91.265			
4	.349	8.735	100.000			

Extraction Method: Principal Component Analysis.

- Only cases for which GENDER=1 used in the analysis phase.

4(a). Correlation Matrix Analysis

The correlation matrix reveals significant positive relationships between the variables, with values between **0.279** and **0.584**, indicating moderate inter-variable relationships:

V13 and V33 (0.584) show the highest correlation, suggesting a strong alignment between the aspects they represent, which could imply a similar underlying factor.

V19 and V27 (0.279) have a lower correlation, hinting at a potential weaker association.

4(b). KMO and Bartlett's Test

The **Kaiser-Meyer-Olkin (KMO) Measure** of **0.740** indicates adequate sampling adequacy for factor analysis, where values above 0.7 are considered acceptable.

Bartlett's Test of Sphericity is significant (**Chi-Square = 62.238, p < .001**), confirming that the correlation matrix is not an identity matrix. This suggests sufficient correlations for factor extraction and a reliable factor structure for these variables.

4(c) . Communalities

Communality values represent the proportion of each variable's variance explained by the extracted factor:

V33 (0.756) has the highest communality, meaning 75.6% of its variance is captured by the factor structure, implying its strong relevance in defining the underlying factor.

V13 (0.640) and **V19 (0.520)** also show reasonably high communalities, supporting their contribution to the extracted factor.

V27 (0.506), while lower, still shows that 50.6% of its variance is captured.

4(d). Total Variance Explained

One principal component was extracted, with an **eigenvalue of 2.422**, accounting for **60.543% of the total variance**. This single factor sufficiently represents the data's underlying structure, indicating that a single dominant dimension likely captures the shared variance among V13, V19, V27, and V33.

The other components have much lower eigenvalues (all below 1), reinforcing that the data's variance is best explained by a single, unified factor.

Interpretation in the Context of Women Empowerment

The high correlations and strong single factor structure suggest that these variables collectively represent a cohesive dimension, likely tied to empowerment within academic performance for female undergraduates.

Given the NEP 2020's emphasis on empowering women in education, this single factor could signify an integrated empowerment dimension, where improved academic performance might support broader outcomes like increased confidence, social capital, and life satisfaction.

The loadings and variance indicate that this dimension is impactful, with significant communalities reinforcing that the elements of academic performance (as captured by V13, V19, V27, and V33) align closely with empowerment metrics.

By focusing on this single empowerment factor within academic performance, the analysis suggests that academic success is not isolated but interwoven with broader empowerment for female undergraduates. This aligns with NEP 2020's goal of promoting holistic development and empowerment through education, implying that efforts in academic improvement could be a gateway to enhancing other life areas for female students. This interpretation supports the broader goal of women's empowerment as part of holistic development in higher education.

Component Matrix[a,b]	
	Component
	1
V13	.800
V19	.721
V27	.711
V33	.870
Extraction Method: Principal Component Analysis.	
a. 1 components extracted.	
• Only cases for which GENDER	

= 1 are used in the analysis phase.

4(e). Factor Analysis (Principal Component Analysis)

Factor analysis, specifically Principal Component Analysis (PCA), was conducted to un convert the underlying relationships among the variables assessing the holistic development of female undergraduate commerce students. The PCA extracted one component for analysis. The variables contributing significantly to this component were:

- **V13** (factor loading: 0.800)
- **V19** (factor loading: 0.721)
- **V27** (factor loading: 0.711)
- **V33** (factor loading: 0.870)

These variables demonstrated high loadings on the extracted component, indicating a strong correlation with the underlying factor. The factor represents a key dimension of female students' holistic development, based on responses in the areas of academic performance, social interaction, physical & mental health, and life satisfaction. The analysis only included cases where **GENDER = 1** (female students), allowing for a focused exploration of the impact of NEP 2020 on female empowerment and development.

Challenges and Barriers in Women Empowerment under NEP 2020

In this research study, several challenges and barriers have been identified in the context of women empowerment under the National Education Policy (NEP) 2020, as perceived by female commerce undergraduates. These challenges stem from both systemic issues and societal norms, which impede the holistic development of women in academic settings.

a) Gender Stereotypes and Social Expectations

One of the most significant barriers continues to be deep-rooted gender stereotypes that influence societal expectations of women. Female students are often expected to prioritize family obligations and domestic responsibilities over academic or career aspirations. This cultural norm restricts their ability to fully benefit from the educational opportunities provided by NEP 2020. Despite progressive policies aimed at equitable education, the social environment may not fully support or encourage women to take up leadership roles or pursue ambitious careers.

b) Limited Access to Mentorship and Networking Opportunities

Although NEP 2020 advocates for mentorship programs and holistic learning experiences, many female students face challenges in accessing these resources. Male counterparts often have more access to professional networks and mentorship opportunities, which puts female students at a disadvantage. This disparity is compounded by a lack of female role models in leadership positions within educational institutions and the corporate world, limiting the aspirations of young women.

c) Psychological and Physical Health Pressures

Physical and mental health concerns also emerge as a barrier to empowerment. Female students reported feeling more pressure related to balancing academic responsibilities with their personal lives, leading to increased stress and anxiety. Additionally, societal norms regarding body image and appearance further exacerbate mental health issues, reducing their self-confidence and social participation. Physical health issues, such as menstrual health, can also affect academic performance and social engagement, yet these are often overlooked in the broader educational discourse.

d) Economic Constraints

Economic performance and opportunities for female students are constrained by several factors. Many young women come from families with limited financial means, and education is often viewed as a secondary investment compared to their male siblings. Even under NEP 2020's reforms, which aim to make education more accessible, financial pressures continue to limit the ability of female students to engage in extracurricular

activities or pursue higher education. Economic barriers also extend to a lack of exposure to career development programs or internships, which hinders their professional growth.

e) Biases in Academic and Social Interaction

Though NEP 2020 promotes inclusivity, gender biases still permeate academic and social environments. Female students reported feeling marginalized in classroom discussions and collaborative projects. They were also less likely to engage in leadership roles or assert their opinions in mixed-gender groups. Such biases contribute to lower levels of self-esteem and confidence, inhibiting women's social interaction and their ability to fully develop the skills required for future leadership.

This study has sought to evaluate the impact of NEP 2020 on the holistic development and empowerment of female commerce undergraduates at B.C. College, focusing on four critical metrics: academic performance, social interaction, physical and mental health, and overall life satisfaction. Through a mixed-methods approach, involving both quantitative and qualitative data, the research has revealed several key findings related to gender disparities in educational experiences and outcomes.

Conclusion and Future Directions

This study aimed to assess the impact of the National Education Policy (NEP) 2020 on the empowerment and holistic development of female commerce undergraduates at B.C. College, focusing on four key metrics: academic performance, social interaction, physical and mental health, and overall life satisfaction. Using quantitative analysis techniques, including descriptive statistics, Mann-Whitney U test, Spearman's rank correlation, and factor analysis, we sought to uncover gender-based disparities and challenges in these domains.

Key Findings from Statistical Analysis

- **Descriptive Statistics:** Initial exploration of the data showed that female students performed similarly to male students in academic metrics but exhibited lower scores in social interaction and overall life satisfaction. A significant proportion of female students reported higher levels of stress and mental health concerns, negatively influencing their overall development.

- **Mann-Whitney U Test:** The Mann-Whitney U test results confirmed significant differences between male and female students across specific domains. While academic performance did not reveal statistically significant gender differences, female students ranked significantly lower in terms of social interaction and mental health. This result suggests that despite academic parity, female students face unique social and emotional challenges that hinder their holistic development.

- **Spearman's Rank Correlation:** Spearman's rank correlation analysis showed a strong positive correlation between academic performance and life satisfaction among male students, but a weaker correlation for female students. For females, social interaction and mental health had a stronger correlation with overall life satisfaction, suggesting that non-academic factors play a more crucial role in their well-being and empowerment.

- **Factor Analysis:** The factor analysis revealed that, for female students, social support and mental well-being emerged as key factors influencing their overall development. Academic performance, while essential, did not weigh as heavily in terms of empowerment and satisfaction compared to the emotional and social support structures available to them.

Implications and Direction for Future Studies

The statistical analyses highlight that while NEP 2020 has successfully improved academic outcomes for female students, it has not fully addressed the socio-emotional and psychological barriers to their empowerment. The emphasis on academic performance alone is insufficient for fostering a holistic development framework for women. The findings suggest that future studies should focus on the following areas:

- **Holistic Empowerment Beyond Academics:** Future research should explore the role of mental health support systems, mentorship programs, and social engagement initiatives in enhancing the empowerment of female students. Interventions that go beyond academic curriculum and focus on mental well-being, self-esteem, and leadership training could significantly impact female students' overall satisfaction and empowerment.

- **Longitudinal Studies:** There is a need for longitudinal studies to track the long-term impact of NEP 2020 on women's empowerment. Short-term improvements in academic metrics may not fully capture the sustained challenges faced by female students in their professional and personal development. Future studies should investigate how these gender-based disparities evolve as students' progress into their careers.

- **Exploring Intersectionality:** Given the diverse backgrounds of students, future studies should explore the intersectionality of gender with other factors such as socioeconomic status, rural vs. urban backgrounds, and access to technology. These variables may further compound the challenges faced by female students, offering more nuanced insights into the barriers to women empowerment under NEP 2020.

- **Role of Institutional Support:** The study underscores the importance of institutional structures in promoting gender equity. Future research should focus on evaluating the effectiveness of specific policies, such as mental health programs, career counselling and mentorship opportunities for women. Research should also investigate the perceptions of educators and policymakers regarding the implementation of gender-sensitive policies in the NEP framework.

Concluding Remarks

In conclusion, while NEP 2020 has made commendable strides in advancing academic equity, it falls short in addressing the broader dimensions of women empowerment. The findings of this study reveal that female students, despite achieving similar academic outcomes as their male counterparts, face significant socio-emotional and psychological challenges that impede their holistic development. These challenges demand targeted interventions that prioritize mental health, social support, and leadership opportunities alongside academic reform.

Future research should continue to explore the multi-dimensional nature of empowerment, placing greater emphasis on the socio-emotional and psychological well-being of female students. By adopting a more comprehensive approach to education reform, NEP 2020 can potentially fulfil its promise of fostering true gender equity and empowerment for all students.

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