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Determinants of women sports participation: A factor analysis

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Abstract
Objective: To find out the determinants which influence the participation of women in sports.
Method: 300 female students from schools of Varanasi, Uttar Pradesh with age range from 15 to 16 years. Factor Analysis was used to find the different factors and items with reveals the different influence in sports participation of women.
Results: Eleven factors were extracted with 60.99% of variance in totality.
Conclusion: Multiple factors were extracted which influence the sports participation with emphasis on.

Keywords: SPSS, esteem, attitude etc.

Introduction
Education is one of the most powerful tools for empowering individuals, communities, and, in particular, women and girls. Academic success and literacy rates are both indications of a society's overall progress. Women's empowerment and gender equality are critical for long-term progress and stability.
Biological, economic, and cultural variables all have an impact on women's health. While it is conventional to anticipate women to live longer than males, this does not always suggest a higher quality of life. Women, according to statistical evidence, are more ill and disabled throughout their lives than men. It has been hypothesized that when basic maternity care is unavailable, women are particularly vulnerable. Numerous studies have documented the community's, paramedical staff's, NGO's, policymakers', and teachers' voluntary participation in various development programmes aimed at reducing poverty and increasing female literacy rates (Reed *et al*., 2017) [2].
According to many reviews and relevant studies, the researcher chose the questionnaire "Attitude of girls towards sports participation" to determine the probable replies and various characteristics of girls' attitudes toward sports participation.

Methods
This study enlisted the participation of 300 female students. Participants were chosen at random from several Varanasi schools and ranged in age from 15 to 16 years old. Subjects were given signed, voluntary, and informed consent prior to participation, and a self-made questionnaire titled *"Attitude of Girls towards Sports Participation Questionnaire"* was used. Factor Analysis and Percentages were used to examine the many replies collected in terms of distinct personal and social problems (Provision) that limit Girl's from participating in sports activities. SPSS 20. Software was used to conclude all the research questions.

Results and Discussion

Table 1: KMO and Bartlett's test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.644
Bartlett's Test of Sphericity	Approx. Chi-Square	979.208
	Df	351
	Sig.	.000

The KMO value ranges between 0 and 1. The sample size for the factor analysis is more appropriate the closer the KMO value is near 1 (Verma, 2013) [7]. In this case, KMO value is 0.644, which is <0.5; hence, the sample size is adequate for this study and it shows that the investigator can proceed further with the exploratory factor analysis.

To see if a correlation matrix is an identity matrix, Bartlett's sphericity test is performed. Because the significance value (p value) of Bartlett's test is.000 in Table 3, which equals o.o5, the correlation matrix is not an identity matrix. As a result, it is possible to conclude that the factor model is adequate (Verma, 2013) [7].

Table 2: Communalities in esteem

Question no.	Extraction
6	.560
25	.545
33	.703
42	.553
49	.592
50	.717
57	.614
58	.557
66	.664
69	.564
73	.617
74	.577
77	.591
83	.548
85	.747
87	.585
88	.613
89	.637
90	.591
92	.630
93	.611
94	.591
95	.707
96	.557
97	.636
110	.591
111	.569

Extraction Method: Principal Component Analysis.

When a variable has a high communality, it suggests that the bulk of its variability is explained by all of the components revealed in the study. If the value of the variable communality is 0.4, it is considered unnecessary and should be eliminated from the model. Table 18 demonstrates that all of the variables have communalities greater than 0.4, indicating that they are all meaningful in the model and that the investigator can use them all for factor analysis (Verma, 2013) [7].

Table 3: Total variance explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	3.216	11.910	11.910	3.216	11.910	11.910	1.731	6.413	6.413
2	1.777	6.583	18.493	1.777	6.583	18.493	1.647	6.101	12.514
3	1.626	6.022	24.515	1.626	6.022	24.515	1.645	6.093	18.607
4	1.567	5.803	30.318	1.567	5.803	30.318	1.639	6.072	24.679
5	1.389	5.144	35.461	1.389	5.144	35.461	1.601	5.929	30.608
6	1.295	4.796	40.257	1.295	4.796	40.257	1.468	5.438	36.046
7	1.229	4.550	44.808	1.229	4.550	44.808	1.453	5.381	41.427
8	1.185	4.389	49.197	1.185	4.389	49.197	1.396	5.169	46.596
9	1.118	4.140	53.336	1.118	4.140	53.336	1.321	4.893	51.489
10	1.050	3.889	57.226	1.050	3.889	57.226	1.311	4.856	56.346
11	1.017	3.768	60.994	1.017	3.768	60.994	1.255	4.648	60.994
12	.970	3.593	64.587						
13	.919	3.403	67.989						
14	.854	3.162	71.151						
15	.824	3.051	74.202						
16	.763	2.827	77.029						
17	.720	2.667	79.696						
18	.691	2.559	82.255						
19	.663	2.455	84.710						
20	.635	2.352	87.062						
21	.581	2.151	89.213						

22	.545	2.018	91.231						
23	.513	1.900	93.131						
24	.512	1.895	95.026						
25	.480	1.778	96.804						
26	.442	1.637	98.441						
27	.421	1.559	100.000						

Extraction Method: Principal Component Analysis.

The all three section of the table no. 19 (Initial Eigenvalues, Extraction Sums of Squared Loadings and Rotation Sums of Squared Loadings) is clearly showing that the variance explained in the table is Only 11 (eleven) Factors. Together, they reach to 60.994% of the variability of the original variables. (IBM, 2020)

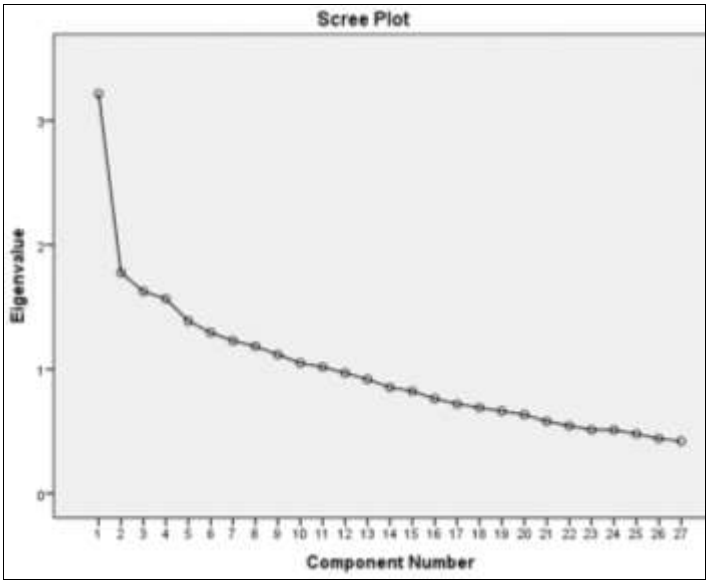

Fig 1: Graphical representation of esteem questions

The screen plot (shown in figure) is created by graphing the factor (along the X axis) against their eigenvalues (along Y axis). Only 11 (eleven) components have eigenvalues greater than one, whereas the rest factors have eigenvalues less than one, as shown in this graph. This Screen plot can be used to determine how many factors should be kept.

Table 4: Rotated component matrix[a] (esteem)

Q. No.	Component										
	1	2	3	4	5	6	7	8	9	10	11
6	.043	-.078	*.623*	-.198	-.160	.114	.243	.082	.097	-.064	.082
25	-.193	.027	.173	.070	*-.573*	-.020	.259	.231	.018	.133	-.074
33	*.613*	.120	-.289	.184	-.227	-.240	.272	.000	.075	-.002	.084
42	.361	.310	-.005	-.019	.049	-.160	.223	-.226	.180	-.321	-.250
49	.062	*.681*	-.078	.201	-.015	.163	-.140	-.035	.033	.064	.156
50	.131	.105	.126	.081	-.047	-.002	-.008	.010	-.025	.014	*.814*
57	.086	.252	.069	.336	.212	.046	.369	-.277	-.006	.337	.228
58	-.135	.328	.020	.237	.337	.090	.286	-.389	.075	.122	.014
66	-.012	*.715*	.101	-.232	.024	.161	.180	.107	.108	-.038	-.068
69	.255	.142	-.135	.307	.380	.216	.384	.096	-.124	-.053	.002
73	*.697*	.064	.112	-.017	.106	.279	-.094	.007	.110	.052	-.046
74	.055	.018	.128	.087	.060	.136	.168	*.697*	-.114	.010	.024
77	-.016	.219	.156	.116	.175	*.651*	.042	.075	.176	-.099	-.044
83	.037	.400	.399	-.062	.289	-.261	-.077	.077	-.131	.169	.122
85	.047	.083	-.029	.028	-.015	-.005	-.088	-.032	.194	*.828*	.055
87	.067	-.023	.063	-.003	.032	.097	*.739*	.089	.083	-.059	-.039
88	.073	.065	-.079	-.008	*.670*	.056	.239	.211	.096	-.016	-.183
89	.200	.123	-.001	-.011	-.111	.228	.030	.003	*.711*	.100	-.040
90	*.628*	-.123	.078	-.080	.338	.030	.098	.104	-.008	.036	.179
92	-.050	-.021	.194	.236	.320	-.142	.188	-.170	*.587*	.046	.021
93	-.041	-.077	.035	*.757*	-.055	.096	.068	.027	.087	-.031	.061
94	-.073	.156	*.658*	.265	-.099	-.088	-.087	.123	.091	-.030	.097
95	.208	-.133	*.537*	.181	-.006	.073	-.032	-.491	-.092	.088	-.249
96	.238	.057	.276	.342	.040	.159	.116	-.041	-.288	-.151	-.395
97	-.004	.104	.006	.346	.241	-.046	-.136	-.051	.378	*-.509*	.150
110	.124	.180	.119	.443	.064	-.135	-.166	.428	.107	.069	-.289
111	.116	.059	-.093	.006	-.046	*.721*	.105	.016	-.031	.095	.023

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

In table no.6, the final solution of the factor analysis after the Varimax rotation is defined. In this final answer, a clear image of the variables explaining the components correctly emerges. As a result, the factors in this final Solution have non-overlapping variables. If the factor loading on the variables is more than or equal to 0.5, the factor extracts enough variance from the variables. As a result, all variables with a loading of 0.5 or greater on a given factor are recognized as belonging to that factor. As a result, each of the 11 (eleven) factors has been has been extracted.

Table 5: Extracted factors after varimax rotation of esteem

Questions	Extraction
Q.73 My educational career will be hampered	.697
Q.66 I feel fear of social criticism if I participate in sports	.715
Q.94 I think it is not good to participate with males	.658
Q.93 I fear than a boy will reject me from marriage if I participate in sports	.757
Q.88 I think my parents restrict me from sports participation because of lack of privacy	.670
Q.111 My caste do not allow me participate	.721
Q.87 I think if I participate in sports my marriage life will be affected	.739
Q.74 I think I will get nothing if I participate in sports	.697
Q.89 I feel ashamed to participate in sports	.711
Q.85 I think dress code should not be compulsory in sports	.828
Q.50 My grandmother do not allow me to participate in sports	.814

After the applying Varimax Rotation, the formula has divided all the questions into 11 factors in which the highest loading factor is extracted from the given table for finalizing the concluded questions of esteem. The extracted variables were selected equals to or more than 0.50 values. So, for above table Question no. 73, 66, 94, 93, 88, 111, 87, 74, 89, 85 and 50 were extracted.

Discussion

Women in ancient societies played varied roles in numerous economic activities, such as women agricultural labour, women skilled labour, and women service class. If specific laws had to be enacted to protect the interests of women employees, and new names developed for them, it is reasonable to assume that they would have been numerous enough to attract the attention of legislators. Caste, class, religion, location, and, most importantly, gender divisions characterize Indian society. In ritual standing and standing stance, there is a distinction between male and female. Women are subjected to a great deal of social discrimination. Women in India are also differentiated by caste, location, religion, and socioeconomic status. As a result, it's difficult to talk about them as a single entity. In most cases, they do not have a status higher than or equal to males. In their situation, caste, class, and other factors combine to create cumulative disadvantages, and they face many burdens of inequity.

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