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Bio-social foundations of work-performance of urban non-manual employees: study of faculty members in Utkal University

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Abstract

Objectives: To explore whether the biological and social contexts have a bearing on the work-performance of the workers in an urban non-manual setting (and which among the two has a predominant impact).
Methods/Statistical analysis: The study uses primary data collected from the faculty members of Utkal University, Bhubaneswar, India. Descriptive statistics and Karl Pearson correlation coefficient have been adopted for profiling and study of the linkages between indicators of work performance and those of biological and social aspects; Independent sample t-tests have been conducted to study the significance of the differences in work performance between the groups as per social and biological stratification.
Findings: Conventional economics associates work performance with factors such as technology, physical and human capital, and quality of materials used in the production process. However, some recent studies highlight the influence of socio-psychological aspects and biological differences among workers as a defining feature of performance diversity. The present study establishes that in case of non-manual work environment like academics, socio-psychological factors such as gender, caste, etc. have a greater bearing (than biological factors like body mass index, some other health anomalies, biologically determined sex, etc.) on work performance.
Application/Improvements: The understanding of these linkages could pave way towards organizations taking care to create good social ambience at work place and the people in their public and private lives in general, which could lead to optimum utilization of individual capacity and collective efforts at the workplace.
Keywords: Biosocial impact, Work-performance, Urban non-manual employees.

1. Introduction

The magnitude of occurrences of the biological processes inside the human system, as being normal or deviating from normal, are realized by comparing them against the prescribed biological standards. Some commonly identified and observed biological foundations of the human system are Body Mass Index (BMI), level of blood pressure, blood sugar level, frequency of occurrence of common diseases, presence of any chronic condition, etc. While deviations of these indicators from normal standards may not be apparently visible in terms of appearance of a person, they might be having some effect on a person's performance in the work sphere in a latent way. A person's food habits, fitness regime, specific consumption habits (like consumption of alcohol, tobacco, etc.), time spent on socialization, are also factors that may be having some impact on work performance. Their possible effects may be via the biological route (that is, through their effect on the person's health, thus improving or degrading his/her productivity) or via the socio-psychological channel (e.g. social stigma associated with consumption of alcohol may limit their employability, or impair their ability to perform better or may even foster their work performance). Ethnicity supposedly has a bearing on productivity in the sense that people of some ethnic origin are better suited for some specific kind of work and so are likely to reflect better productivity quotients if employed in that field, and so it might be taken into account while examining the work performance.

Given the tremendous growth in the service sector in the last decade and it being the largest contributor to the national Gross Domestic Product (GDP) currently, and given the simultaneous surge in the occurrence of lifestyle diseases as well as other diseases due to adverse environmental conditions, and also the rapidly changing social scenario, it would be of special interest to study for possible links between these three aspects.
Academics as a profession have stood the test of time in the Indian economy since its early days. And it continues to be among the most sought after professions among the middle class who constitute about half of the Indian population.

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Over the years, the horizon of academics has expanded from being confined within the boundaries of classroom teaching to more practical applications and field works. Also, several non-academic activities and social actions have come to be included in the fold of work role of academicians. Nevertheless, academics remain a distinguished member of the group of non-manual works. Research works too have started occupying the centre stage of academic activities. And universities being at the topmost level of educational order, and having large number of faculty members at different levels, and having a wide range of academic and non-academic activities pursued in them, would serve as ideal entities for the studies of such nature. The current study largely falls in the paradigm of the emerging interdisciplinary field 'Bioeconomics', the foundation of which was laid by a Romanian-American mathematician, statistician and economist, named Nicholas Georgescu-Roegen, in the 1980s. But prior to that, attempts towards integration of Economics and Biology had begun in the 1970s itself with the pioneering work of biologist – Michael Ghiselin, and three economists – Gordon Tullock, Gary Becker and Jack Hirshleifer. This interdisciplinary field is based on the belief that human economies and natural ecosystems are essentially interlinked – that the economic behaviour of human beings is a manifestation of the evolution and survival strategies of organisms in natural surroundings. This could help in framing more appropriate economic policies for increasing welfare.

Previous works in this context include studies examining relationships between body mass index and labour market outcomes, impact of diseases and disability on employability and wages, exploration of possible links between body weight and intelligence, labour market outcomes of smoking, impact of self-rated and non-self-rated physical attractiveness on labour market outcomes, and effects of sociability and innovative work behaviour on performance, etc. Health disorders like onset of Type 1 diabetes or disability clearly state negative returns in labour market [1, 2], while height earns rewards always [3, 4]. While overweight often seems to hamper prospects in the labour market and more prominently in case of women [3,5], there is also a study that shows a more prominent penalty in case of men [6] and another one that gives unusually mixed results across the sexes in aspects such as sick-leave days, employability and wages [7]. Smoking is found to have negative impacts on employability and wages [8, 9]. Physical attractiveness as assessed by others has significant positive impacts on labour market prospects [10] and so do sociability [11] and innovative work behaviour [12] in work spheres. Studies emphasizing the influence of family, community, schooling and hedonic aspects as instrumental factors in career choices of youth [13, 14] also form a part of the works reviewed. Almost all the materials reviewed on assessment of academic work performance against a biological background, study the links between BMI and academic performance of students, and collectively give mixed results while mostly revealing a stronger association of higher academic scores with healthy body weight [15-19]. The research works on influence of socio-psychological contexts on work performance, unanimously conclude positive links of academic performance with regularity in diet and consumption of nutritious food, and negative impacts of smoking and alcohol consumption [20-23]. There are also some studies exploring the various facets of time-use with academic performance [24-26]. An article of special interest to the current study is by [27], which provides a model for quantification and assessment of the work performance of academicians (faculty members). It shows their productivity to be a function of both structural and personal factors. The study also rules out effects of biological factors like age and sex on productivity among academicians.

However, since the field is a very new one and it has been developed among the academicians from the non-economic background, it seems the understandings on the linkages are still overwhelmed with non-economics paradigms. And many research questions have remained unaddressed in the available literature. Besides, we did not come across a single study conducted in the Indian context. The available literature on the linkages even at the global level is still scant, so any new research on this topic will add to the existing literature. Based on these research gaps, the present study makes an attempt towards studying the involvement and performance aspects of the faculty members of Utkal University (the 17th oldest university of India and a premier institute of higher studies in the state of Odisha), against a background of their biological and socio-psychological aspects. It aims to examine if biological aspects like age, sex, BMI, level of blood pressure, presence of any chronic condition, etc. and socio-psychological aspects like sex (as gender), caste, choosing a particular stream, etc., show some distinct pattern, and to analyze the possible reasons behind such observed phenomena.

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2. Materials and Methods

The primary research questions to be answered in the present study are:

1. Whether there exists any link between the selected biological indicators and work performance
2. Whether there exists any link between commonly observed socio-psychological aspects and work performance

The study is based on primary data collected from the faculty members of Utkal University. The university's diary for the session 2018-19 was used as a reference for the department and staff profile of the university. As per the diary, there are 31 departments on the whole (27 ordinary and 4 self-financing), which have been categorized into Arts (15 departments), Science (12 departments) and Commerce (4 departments) streams. The period of data collection was from 24 April, 2018 to 5 May, 2018. Census method was adopted for collection of data. Each department was devoted 3 days for data collection, during which 4 rounds (at 4 different hours) were made each day. From the faculty list in the diary, the number of faculty members came to 152 after accounting for those who had retired before the period of the survey, those who were on lien during the period of the survey, those who had left the institution before the period of the survey and those who were found to be on long-term leave during the period of the survey.

A structured questionnaire finalized through a pilot survey, was used for collecting the data. The pilot was initially administered to 3 faculty members from each department via convenient sampling. After careful scrutiny and review, 61 questionnaires were selected for final analysis. Out of them, 39 (63.93%) were male and 22 (36.07%) were female; 12 (19.67%) were from Scheduled Caste (SC) and Scheduled Tribe (ST) groups and 49 (80.33%) were from Other Backward Class (OBC) and General (GEN) groups; 29 ((47.54%) were from Arts stream, 25 (40.98%) were from Science stream and 7 (11.48%) were from Commerce stream; 31 (50.82%) were Assistant Professors, 18 (29.51%) were Associate Professors and 12 (19.67%) were Professors.

The study variables have been classified under four broad heads such as (a) identification and personal profile – the native district to which the respondent belongs, date of joining in this profession, date of starting work in this institution, current designation, etc.; (b) biological indicators – age (here the respondents have been grouped into 3 age groups as per their biological age), sex (biologically determined category of male or female), body mass index (binary), blood pressure (binary), and chronic condition (binary); (c) socio-psychological indicators – sex (here the biological aspect of sex has been analyzed from the societal aspect of gender), caste, stream (educational field), and time-use; (d) work performance indicators – monthly income from all sources (salaried as well as non-salaried income), academic performance index, incidence of professional achievements (promotion, research publications, attending workshops, awards, some specific role-play like heading department or convener of some event/workshop/seminar/conference in university or judge at some academics related programme inside or outside the university, membership of some specific university council/committe, delegate to some event on behalf of the university, etc.), number of sick-leave hours, time-use (on academic and non-academic activities), and participation in social actions. Both descriptive and inferential statistical tools have been used to analyze the data.

3. Results and Discussion

3.1. Profile based on socio-psychological aspects

On the whole, majority of the respondents lie in the Less than 31-40 age groups (that is, in the youngest age group), followed closely by the 51-60 and 41-50 age groups respectively. Half of the female respondents lie in the Less than 31-40 age groups, while the male respondents are more or less uniformly distributed across the three age groups, with the highest number being in the 41-50 age groups. Among social groups, most of the respondents belong to OBC or General category. Also majority of respondents among both males and females belong to this category. Majority of the respondents on the whole belong to the rank Assistant Professor, so do majority of the male respondents as well as female respondents. Most of the respondents belong to Arts stream followed closely by Science stream. Majority of the female respondents belong to Arts stream while majority of the male respondents belong to Science stream (Table 1).

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Table 1. Age, caste, stream, designation and sex wise classification of respondents

		Male	Female	Total
Age	Less than 31-40	12 (30.8%)	11 (50.0%)	23 (37.7%)
	41-50	14 (35.9%)	4 (18.2%)	18 (29.5%)
	51-60	13 (33.3%)	7 (31.8%)	20 (32.8%)
	Total	39 (100.0%)	22 (100.0%)	61 (100.0%)
Caste	SC & ST	10 (25.6%)	2 (9.1%)	12 (19.7%)
	OBC & GEN	29 (74.4%)	20 (90.9%)	49 (80.3%)
	Total	39 (100.0%)	22 (100.0%)	61 (100.0%)
Designation	Asst. Prof	17 (43.6%)	14 (63.6%)	31 (50.8%)
	Asso. Prof	15 (38.5%)	3 (13.6%)	18 (29.5%)
	Prof.	7 (17.9%)	5 (22.7%)	12 (19.7%)
	Total	39 (100.0%)	22 (100.0%)	61 (100.0%)
Stream	Arts	1435.9%	1568.2%	2947.5%
	Science	2153.8%	418.2%	2541.0%
	Commerce	410.3%	313.6%	711.5%
	Total	39100.0%	22100.0%	61100.0%

Source: Compiled from questionnaire survey

In the Less than 31-40 age groups, all respondents except one are at the level of Assistant Professor. Also, among the total number of Assistant professors, majority lie in this age group. In the 41-50 age groups, half of the respondents are at the level of Assistant Professor while nearly another half at the level of Associate Professor and one respondent at the level of Professor. A little more than half of the respondents in the 51-60 age groups are at the level of Professor while a little less than half are at the level of Associate Professor. Also, from among the total number of Associate Professors and Professors, majority belongs to this group (Table 2).

Table 2. Age and designation wise classification of respondents

Age	Total number of respondents	Asst Prof	Asso Prof	Prof
Less than 31-40	23	22 (95.7%)	1 (4.3%)	0 (0.0%)
41-50	18	9 (50.0%)	8 (44.4%)	1 (5.6%)
51-60	20	0 (0.0%)	9 (45.0%)	11 (55.0%)
Total	61	31 (50.8%)	18 (29.5%)	12 (19.7%)

Source: Compiled from questionnaire survey

3.2. Profile based on biological aspects

Among 61 respondents on the whole, 18 (29.5%) are in normal BMI range while 43 (that is, 70.5 %) are in non-normal BMI range. Majority of the respondents in all age groups and also across the sexes, caste groups, streams, and designations, lie in the non-normal BMI range. Out of the 61 respondents, 33 (54.1%) lie in normal BP range while 28 (that is, 45.9%) lie in non-normal BP range. Majority of respondents in all age groups, except in 41-50 groups, belong to normal BP range. Majority of respondents across both the sexes, the two caste categories, and across the three levels of designation, belong to the normal BP range. Majority of the respondents in all the streams, except the Science stream, belong to the normal BP range. On the whole, 17 (27.9%) have some chronic condition or the other while 44 (72.1%) have no chronic condition. Majority of the respondents across the three age groups; both the sexes; both the caste categories; three streams and three levels of designation, have no chronic condition. The tabular representation of the above details is provided through Table 3.

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Table 3. Health profile

Factor	Categories	Total number of respondents	BMI		BP		Chronic Condition	
			Normal	Non-normal	Normal	Non-normal	Absent	Present
Age	Less than 31-40	23	6 26.1%	17 73.9%	14 60.9%	9 39.1%	19 82.6%	4 17.4%
	41-50	18	6 33.3%	12 66.7%	8 44.4%	10 55.6%	11 61.1%	7 38.9%
	51-60	20	6 30.0%	14 70.0%	11 55.0%	9 45%	14 70.0%	6 30.0%
Sex	Male	39	12 30.8%	27 69.2%	20 51.3%	19 48.7%	29 74.4%	10 25.6%
	Female	22	6 27.3%	16 72.7%	13 59.1%	9 40.9%	15 68.2%	7 31.8%
Caste	SC and ST	12	4 33.3%	8 66.7%	8 66.7%	4 33.3%	9 75.0%	3 25.0%
	OBC and GEN	49	14 28.6%	35 71.4%	25 51.0%	24 49.0%	35 71.4%	14 28.6%
Stream	Arts	29	8 27.6%	21 72.4%	18 62.1%	11 37.9%	19 65.5%	10 34.5%
	Science	25	9 36.0%	16 64.0%	10 40.0%	15 60.0%	21 84.0%	4 16.0%
	Commerce	7	1 14.3%	6 85.7%	5 71.4%	2 28.6%	4 57.1%	3 42.9%
Designation	Asst Prof	31	10 32.3%	21 67.7%	17 54.8%	14 45.2%	23 74.2%	8 25.8%
	Asso Prof	18	5 27.8%	13 72.2%	11 61.1%	7 38.9%	14 77.8%	4 22.2%
	Prof	12	3 25.0%	9 75.0%	33 54.1%	28 45.9%	7 58.3%	5 41.7%

Source: Compiled from questionnaire survey

From the 61 respondents, 55 gave complete information about monthly income from all sources, out of whom 34 (61.8%) possess health insurance while 21 (38.2%) do not possess health insurance. The lowest income is ₹25000 and the highest income is ₹192948, and the mean income of the group is ₹82444 (Table 4). Majority of the respondents in the 'Below mean income' group as well as in the 'Above mean income' group possess health insurance. Possession of health insurance percentage is higher in case of the 'Below mean income' group.

Table 4. Mean monthly income from all sources and possession of health insurance

Deviations from mean income	Total number of respondents	Do not possess health insurance	Possess health insurance
Below mean income	37	14 (37.8%)	23 (62.2%)
Above mean income	18	7 (38.9%)	11 (61.1%)
Total	55	21 (38.2%)	34 (61.8%)

Source: Compiled from questionnaire survey

3.3. Work performance aspects

The work performance aspects have been studied taking into account hours spent on academic activities and non-academic activities per day, number of hours lost in sick-leave in the last year, mean monthly income from all sources, mean API score, etc.

Time spent on academic activities broadly includes the time spent in taking classes and time spent on own research and research supervision. From Table 5, we see that the mean hours spent on academic activities is highest in case of 41-50 age groups followed closely by the 51-60 age groups. It is substantially lower in case of Less than 31-40 age groups, which could be because they are in the initial phase of their career as academicians. The time spent on academic activities in case of the 51-60 age groups is little lower than that of the 41-50 age groups may be because the latter are almost at the end of their career as academicians and have perhaps reached the peak of their academic career already. On an average, female respondents spend relatively lesser time on academic activities on daily basis as compared to their male counterparts. This may be due to the need on part of female respondents to devote relatively more time on home-making given our societal customs.

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The non-normal BMI group spends lesser time on academic activities as compared to the normal BMI group. This may be out of feelings of lethargy associated with over-weight or exhaustion associated with under-weight. The non-normal BP group spends lesser time on academic activities as compared to their normal counterparts. This may be because of the adverse health symptoms associated with deviations from the normal blood pressure range. Respondents without any chronic condition and respondents belonging to OBC and General category spend more time on academic activities than their counterparts. Respondents from the Science stream spend higher amount of time on academic activities on daily basis, as compared to those from Arts and Commerce streams. This could be due to their courses having large number of practical classes. Independent sample t-tests of the difference of means in case of Sex, BMI, BP, Chronic condition and Caste, show the differences to be insignificant at 95% confidence interval (equal variances assumed and 56 degrees of freedom).

In the time spent on non-academic activities, the time spent on department related non-academic activities as well as university related non-academic activities (such as administrative works, hostel duties, etc.) and time spent on meetings related to profession as well as meetings unrelated to profession, have been taken into account. On an average, the 51-60 age groups spend highest amount of time on non-academic activities on daily basis as compared to the other age groups. This may be because majority of the respondents in this age group are at the level of Associate Professor or Professor and so many of them may be heading their departments and other university committees. Females spend more time on non-academic activities as compared to their male counterparts. This may be due to their inability to refuse extra work allotted to them, given their relatively submissive behaviour in our societal context. On an average, the non-normal BMI group, the non-normal BP group, respondents with some chronic condition, SC and ST respondents, spend more time on non-academic activities per day as compared to their normal counterparts. Among streams, respondents from Commerce stream spend highest amount of time on non-academic activities compared to the two other streams. This may be due to the presence of a self-financing course (where there are fewer classes on daily basis thus allowing relatively more time and scope for non-academic activities). Independent sample t-tests of the difference of means in case of Sex, BMI, BP, Chronic condition and Caste, show the differences to be insignificant at 95% confidence interval (equal variances assumed and 40 degrees of freedom).

Table 5. Mean daily hours on academic and non-academic activities; mean hours lost due to sick-leave last year

Factor	Categories	Mean daily hours on academic activities	Mean daily hours on non-academic activities	Mean hours lost due to sick-leave last year
	Less than 31-40	5.16	3.40	45.91
	41-50	6.05	3.56	24.00
	51-60	6.03	3.87	24.00
Sex	Male	5.94	3.42	24.00
	Female	5.32	3.81	46.91
BMI	Normal	5.81	3.49	46.67
	Non-normal	5.66	3.65	26.23
BP	Normal	5.76	3.45	16.73
	Non-normal	5.64	3.82	50.57
Chronic condition	Absent	5.94	3.44	27.82
	Present	5.03	4.10	43.77
Caste	SC and ST	5.61	3.94	
	OBC and GEN	5.73	3.53	
Stream	Arts	5.08	3.50	17.38
	Science	6.57	3.59	58.56
	Commerce	4.92	4.13	0

Source: Computed from questionnaire survey

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Among the different age groups, the Less than 31-40 age groups had the highest loss of hours in sick-leave last year, as compared to the other two age groups. While it may mean that they had the highest incidence of sickness among the three age groups, there is also a possibility that since majority of the respondents in the other two age groups are at the level of Associate Professor and Professor and have relatively higher work burden (given that they spend substantially higher amount of time on both academic as well as non-academic activities) so they perhaps chose not to avail a sick-leave in spite of their sickness. Female respondents and normal BMI group had almost double the time lost in sick-leave while non-normal BP group had triple the time lost in sick-leave, as compared to their counterparts. On an average, respondents with some chronic condition, respondents from OBC and General category, and respondents from Science stream lost more time in sick leave than their counterparts. Respondents from Commerce stream apparently did not lose time in sick-leave last year. Independent sample t-tests of the difference of means in case of Sex, BMI, Chronic Condition and Caste, show the differences to be insignificant at 95% confidence interval (equal variances assumed and 40 degrees of freedom). However, the difference of means in case of BP is significant (0.035) (Table 5).

On the whole, nearly half of the respondents had some professional achievement in the last two years (Table 6). The incidence of professional achievements is equal in case of both 41-50 and 51-60 age groups, and it is substantially higher than that of the Less than 31-40 age groups respondents. This might be because while the 41-50 age groups are at the middle of their professional career and so could be ambitiously aspiring for the highest professional level, the 51-60 age groups respondents are in the last phase of their professional career and so could be putting in more serious efforts towards professional achievements. Female respondents, the normal BMI group, the normal BP group, respondents without any chronic condition, and respondents belonging to OBC and General caste groups, have a comparatively higher incidence of professional achievements. Across streams, the incidence of professional achievements is highest among respondents in the arts stream.

Table 6. Professional achievements in the last two years

Factor	Categories	Total number of respondents	Had some professional achievement in last two years
	Less than 31-40	23	10 (43.5%)
	41-50	18	9 (50.0%)
	51-60	20	10 (50.0%)
	Total	61	29 (47.5%)
Sex	Male	39	16 (41.0%)
	Female	22	13 (59.1%)
	Total	61	29 (47.5%)
BMI	Normal	18	10 (55.6%)
	Non-normal	43	19 (44.2%)
	Total	61	29 (47.5%)
BP	Normal	33	16 (48.5%)
	Non-normal	28	13 (46.4%)
	Total	61	29 (47.5%)
Chronic condition	Absent	44	21 (47.7%)
	Present	17	8 (47.1%)
	Total	61	29 (47.5%)
Caste	SC and ST	12	5 (41.7%)
	OBC and GEN	49	24 (49.0%)
	Total	61	29 (47.5%)
Stream	Arts	29	17 (58.6%)
	Science	25	11 (44.0%)
	Commerce	7	1 (14.3%)
	Total	61	29(47.5%)

Source: Compiled from questionnaire survey

From among 61 respondents, 27 (44.3%) respondents participate in some social actions either on behalf of the University or on their personal fronts and 34 (55.7%) do not participate. Among the various age groups, the participation rate of the Less than 31-40 age groups is highest. This may be because they are relatively younger and so have more enthusiasm for such causes, and it might also be an attempt on their part to build their social capital since they are more or less in the early phases of their work life. They are followed by the 41-50 and 51-60 age groups respectively, showing the declining involvement in such activities with age.

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As against conventional beliefs, the participation rate of females in social actions is higher than that of males. The participation rate of the normal BMI group is higher as compared to non-normal BMI group. This could be because social actions usually require physical exertion and so is not much preferred by non-normal BMI groups due to lethargy or tiredness. The participation rate of the respondents with chronic conditions absent is higher than their counterparts with some or other chronic condition. This may be because the presence of some chronic condition might be inhibiting their involvement in such actions due to adverse health symptoms associated with the chronic conditions. However, the participation rate of non-normal BP group is higher than their normal counterparts. The participation rate of OBC and General Category respondents is higher than the respondents from SC and ST caste group. The participation of Arts stream is highest. This may be because Arts courses do not have practical classes and so faculty members perhaps get little more time to indulge in social actions. Table 7 provides an elaborate detail of the above findings.

Table 7. Participation in social actions

Factor	Categories	Total number of respondents	Number of participants
	Less than 31-40	23	12 (52.2%)
	41-50	18	8 (44.4%)
	51-60	20	7 (35.0%)
	Total	61	27 (44.3%)
Sex	Male	39	16 (41.0%)
	Female	22	11 (50.0%)
	Total	61	27 (44.3%)
BMI	Normal	18	10 (55.6%)
	Non-normal	43	17 (39.5%)
	Total	61	27 (44.3%)
BP	Normal	33	14 (42.4%)
	Non-normal	28	13 (46.4%)
	Total	61	27 (44.3%)
Chronic condition	Absent	44	21 (47.7%)
	Present	17	6 (35.3%)
	Total	61	27 (44.3%)
Caste	SC and ST	12	4 (33.3%)
	OBC and GEN	49	23 (46.9%)
	Total	61	27 (44.3%)
Stream	Arts	29	14 (48.3%)
	Science	25	11 (44.0%)
	Commerce	7	2 (28.6%)
	Total	61	27 (44.3%)

Source: Compiled from questionnaire survey

From Table 8, it can be observed that across age groups, the mean monthly income from all sources is lower in case of females than males. Standard deviation in monthly income from all sources is highest for 51-60 age groups respondents in case of both males and females, and it is higher in case of males. This implies, there is less uniformity in monthly income from all sources among male respondents in that age group as compared to the female respondents in that age group. In general too, the standard deviation across age groups is lower in case of females than males. The range value too is highest for the 51-60 age groups in case of both males and females, but it is substantially higher in case of males, implying a much larger difference between the highest and lowest earning males in that age group as compared to the highest and lowest earning females in that group. In general too, the range values across age groups, is lower in case of females than males.

However, the mean API last year of females across all age groups, is slightly greater than that of males. Across age groups, standard deviation in API last year is highest for 51-60 age groups in case of both males and females, and it is higher in case of females.

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This means that there is less uniformity in API scores among female respondents in that age group as compared to the males respondents. The range value too is highest for the 51-60 age groups in case of both males and females, and it is substantially higher in case of females, signifying a much larger difference between the highest and lowest female scorers in that age group as compared to the highest and lowest male scorers in that group.

Table 8. Age wise gap in monthly income from all sources and API last year

Age		Male	Female	Gap in % of Male
Less than 31-40	Mean monthly income	56048	53633	4.3%
	Standard deviation	10643	8391	
	Range	36000	23000	
41-50	Mean monthly income	70036	36713	47.6%
	Standard deviation	24052	10274	
	Range	85500	25000	
51-60	Mean monthly income	134912	114429	15.2%
	Standard deviation	44363	31958	
	Range	122948	87000	
Less than 31-40	Mean API last year	83.6	83.7	-0.1
	Standard deviation	42.0	46.4	
	Range	132.5	150	
41-50	Mean API last year	118.9	120.5	-1.3
	Standard deviation	74.1	14.9	
	Range	275	35.5	
51-60	Mean API last year	139.1	143.1	-2.9
	Standard deviation	80	112.4	
	Range	277.5	332.5	

Source: Computed from questionnaire survey

Across designations, the mean monthly income from all sources is lower in case of females than males (see Table 9). Standard deviation in monthly income from all sources, is highest for Professors but is more or less equal to that of Associate Professors, in case of both males and females, and it is little higher in case of males. This implies, there is less uniformity in monthly income from all sources among male respondents in that age group as compared to the female respondents in that age group.

Table 9. Designation wise gap in monthly income from all sources and API last year

Designation		Male	Female	Gap in % of Male
Asst Prof	Mean monthly income	53959	48296	10.5
	Standard deviation	10164	12322	
	Range	37000	43000	
Asso Prof	Mean monthly income	86393	71667	17.0
	Standard deviation	26049	25658	
	Range	90000	50000	
Prof	Mean monthly income	162707	127200	21.8
	Standard deviation	27989	25792	
	Range	82948	52000	
Asst Prof	Mean API last year	104.5	94.6	9.47
	Standard deviation	70.2	44.3	
	Range	270.5	150	
Asso Prof	Mean API last year	121.8	194.3	-59.52
	Standard deviation	82.6	165.1	
	Range	283.5	287	
Prof	Mean API last year	124.6	103.8	16.69
	Standard deviation	39.9	43.6	

Source: Computed from questionnaire survey

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In general, the standard deviation across designations is lower in case of females than males, implying less uniformity in monthly income from all sources among male respondents than female respondents. The range value however is highest for Associate Professors in case of male respondents and for Professors in case of female respondents. It implies greater disparity in monthly income from all sources between the highest earner and the lowest earner among Associate Professors as compared to Assistant Professors and Professors, in case of male respondents. While in case of female respondents, the greatest disparity among the highest and lowest earners prevails among Professors.

The mean API last year of females, except in case of Associate Professors, is lower than that of males. Across age designations, standard deviation in API last year, is highest for Associate Professors in case of both males and females, and it is higher in case of females. This means that there is less uniformity in API scores among female Associate Professors as compared to their male counterparts. The range value too is highest for Associate Professors in case of both males and females, and it is substantially higher in case of females (almost double that of males), signifying a much larger difference between the highest and lowest female scorers among Associate Professors as compared to the highest and lowest male scorers among Associate Professors.

From Table 8 and 9, we observe that, the mean monthly income from all sources of female respondents across age groups and designations remains lower than their male counterparts though the mean API score last year of female respondents across age groups and designations remains higher than their male counterparts (except two exceptions). This could imply that male respondents earn relatively higher than their female counterparts from non-salaried work.

However, in Table 8 as we see, the difference between the mean monthly income from all sources of male and female respondents for the age groups 41-50, is abnormally large (the mean income of male respondents in that age group is almost double that of the female respondents in the same group). This could be linked to an existing fact in the university that many of the faculty members in that age group belong to the group of 'consolidated salary' earners, and perhaps among our respondents a relatively large number of female respondents in that age group are coincidentally a part of it and so the mean income of females in that age group comes out to be unusually low not only when compared with male respondents from the same age group but also when compared with female respondents from the younger age group.

Taking into account possibility of relationships between the variables Time spent on academic activities on daily basis, Years of experience in this profession, BMI, Total monthly income from all sources, and API last year, as in – time spent on academic activities could be affecting API which in turn could be affecting income; years of experience could be affecting time spent on academic activities and so on; BMI could be affecting time spent on academic activities and thus may be API and income; Years of experience could be affecting BMI and so on; etc, we constructed a correlation matrix (presented through Table 10) of the above variables. The correlation matrix reveals that there exists a statistically significant amount of correlation between Years of experience in this profession and Total monthly income from all sources (0.621) and between Years of experience in this profession and API last year (0.339), at 95% confidence interval.

Table 10. Correlation matrix of time spent on academic activities on daily basis, years of experience in this profession, BMI, total monthly income from all sources, API last year

		Time spent on academic activities on daily basis	Years of experience in this profession	BMI	Total monthly income from all sources	API last year
Time spent on academic activities on daily basis	Correlation Sig. (2-tailed)	1	.001 .995	.080 .552	-.131 .350	.135 .320
Years of experience in this profession	Correlation Sig. (2-tailed)		1	.023 .867	.621* .000	.339* .011
BMI	Correlation Sig. (2-tailed)			1	-.013 .926	.052 .698
Total monthly income from all sources	Correlation Sig. (2-tailed)				1	.066 .640
API last year	Correlation Sig. (2-tailed)					1

Significant at Confidence Interval 95%
Source: Computed from questionnaire survey

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4. Conclusion

The analyses reveal that the 41-50 and 51-60 age groups seem academically more active. They spend substantially high amount of time on academic activities (nearly at par with each other). They have much lower loss of time in sick-leave (equal for both the groups) and have much higher incidence of professional achievements in last two years (equal for both the groups). In addition, they also spend higher amount of time on non-academic activities. However, their participation in social actions is considerably lower.

The amount of time spent on academic and non-academic activities, time lost in sick-leave, incidence of professional achievements, participation in social actions, etc., when studied in the background of biological factors such as BP, BMI, presence or absence of chronic condition, etc., give mixed results but mostly hint towards a relatively better work performance on part of those belonging to normal BMI and BP groups and those with no chronic condition (with a couple of exceptions, they generally spend more time on academic activities, have lesser time loss in sick-leave, higher incidence of professional achievements, more involvement in social actions, etc.) – in line with the summary of the section of literature dealing with biological aspects (especially BMI) and work performance.

However, female respondents spend relatively lesser time on academic activities on daily basis as compared to their male counterparts. We see that the API scores of female respondents across age groups and designations (except two exceptions) are higher than their male counterparts. This implies that on the efficiency front female respondents do not lag behind their male counterparts (and it could possibly mean that they are more efficient than their male counterparts since they have higher API scores in spite of spending lesser time on academic activities). This overrules the impact of biological aspect of sex on work performance. Male respondents score higher than their female counterparts when it comes to monthly income, though the female respondents have an edge over the male respondents when it comes to API scores. And as we have stated earlier, the reason could possibly be that male respondents earn relatively higher than their female counterparts from non-salaried activities (like going for paper corrections and examination duties outside the university, consultancies, etc.). But even if that's the reason, it is despite the fact that more number of male respondents than female respondents belong to the non-normal BMI and BP groups and possess some chronic condition. So this again casts a shadow on the impact of biological aspects on work performance. And since, as such career in academics is of a non-manual work nature, so here the differences between the sexes may be more appropriately explained in terms of socio-psychological aspects (such as gender role-play) rather than in terms of biological factors.

The caste groups viewed as higher in social order have better performance with regards to time spent on academic activities, incidence of professional achievements and participation in social actions thus emphasizing a substantial influence of social aspects. So overall, we may conclude that socio-psychological aspects have a more significant bearing on work performance (compared to biological factors) in non-manual work environment, such as academics, as has been suggested by the only literature pertaining to quantification of academic work performance of faculty members that we could come across (which rules out effect of biological factors like age and sex and emphasizes influence of structural and functional factors which are basically socio-psychological in nature).

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