The Influence of Commute Time on Life and Job Satisfaction among Urban Workers

ORIGINAL ARTICLE

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Abstract

The daily time spent on commuting to work imposes severe constraints on the allocation of time for other activities. Lately, scholars have shown a growing interest in understanding the influence of commuting time on overall health. Based on primary survey conducted in Visakhapatnam city, this paper explores the interdependence between commuting time spent by workers to reach workplace and their satisfaction with life and job. The results show that life satisfaction has declined gradually along with increasing time spent on commuting, unlike job satisfaction, which is initially increased with increasing commuting time, but declined after 30 minutes of duration. It is also found that the mode of transportation to workplace, and type of house ownership has significant influence on the level of job satisfaction, and life satisfaction.

Key Words

Commuting, Life Satisfaction, Transportation, City.

Introduction

The daily time spent on commuting to work imposes severe constraints on the allocation of time for other activities. Lately, scholars have shown a growing interest in understanding the influence of commuting time on overall health. This chapter explores interdependence between commuting time spent by workers to reach workplace and their satisfaction with life and job. The daily commute for work consumes a significant amount of time and often results in stressful experiences for many commuters, especially those travelling long distances. A study conducted by Frimen et al (2017), demonstrated that daily commuting affects both life satisfaction and job satisfaction.

Commuting between residence and workplace is one of the most critical components for individuals, as it is a daily activity associated with job satisfaction and overall life satisfaction. There were many studies conducted in different developed countries found that commuting time negatively associate with life satisfaction (Olsson et al, 2013; Choi et al, 2013; Dickerson et al, 2014; Nie and Sousa-Poza, 2018; Stutzer and Frey, 2008). Commuting time affect various sub-domains of life differently. A study based on GSOEP data found that longer commute distance is negatively associated with life satisfaction but no association with job satisfaction (Lorenz, 2018). It was also found that life satisfaction varies by the mode of transportation. For instance, active commuting users have reported higher levels of satisfaction than public transport users (Olsson et al,

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2013; St-Louis et al, 2014). As per the economic theory individuals take burden of commuting time if they engaged in better jobs or housing facilities (Stutzer and Frey, 2008).

Despite the fact, India is commitment to achieving Sustainable Development Goals (SDG) in target SDG-3 (ensuring a health and well-being) and SDG-11.2 (Sustainable cities and communities), many Indian cities face significant challenges related to air pollution, especially high-density population and congested urban areas. Vehicle emission contribute to significantly to high level of particulate matter, nitrogen dioxide, and other pollutants. Which is leading to higher rates of respiratory disease, cardiovascular disease (Majumdar,2021; Handy, et.al, 2019; WHO, 2020). Moreover, the long and stress commuting have also adverse effects on mental well-being. Traffic congestion and noise pollution can exacerbate anxiety and depression. further impacting commuter's health.

The decision, whether to commute or not, among men and women depends on various factors and determinants. These include demographic factors (age, gender and Family size), socio-cultural (level of education, social category) economic (nature of job, sector of employment), infrastructural (distance of commuting, accessibility and connectivity). The most important components of commuting are commuting time; the commuting distance; and the mode of transportation (Razzak et.al, 2023). Commuting time refer to the normal time spent by employees travelling from home to their assigned work place. The daily commute to work can take up a substantial amount of time and can significantly influence an individual's wellbeing. There are the studies has been aimed at investigating mobility and well-being of individual. However, there is dearth of literature of commuting time and life satisfaction among the workers in Indian context.

Data and Methods

The cross-sectional survey conducted at Visakhapatnam city has encompassed with various question on demographic and socio-economic conditions of commuters with their sector of employment. The variables we have consider for the analysis include gender, household ownership (whether living in own house or rented), household size (1-2 members, 3-4 members, 5-6 members, 7-8 members), time spend on traveling to reach workplace (<=15 min, 15-30 min, 30 - 45 min, >=45 min), social category of the household (General, OBC, SC and ST), age of respondent (20-30, 31-40, 41-50, 51 and above), and sector of employment (education, health, manufacturing, public administration, transport).

The analysis was conducted using Stata-17 by StataCorp. Data analysis was performed using descriptive and inferential statistics, including logistic regression and chi square analyses. Categorical variables were reported as frequencies (N) and percentage (%). Furthermore, the robustness of all analysis and their associations was checked using chi square test. Additionally, logistic regression was conducted to examine the relationship between commuters' characteristics and their levels of life and job satisfaction.

The chi square explanation is as follows:

The chi square (x^2) tests statistic with contingency table is

$$x^2 = \text{``}\frac{(O_i - E_i)^2}{E_i}\text{''} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\text{equation (1)}$$

Where the notion is

- ➤ x^2 is chi square test statistics

- ➤ O_i is the observed frequency for each category

- ➤ E_i is the expected frequency for each category

Dependent Variable

For measuring the commuter's wellbeing. There are two question we have included. First, *How satisfied are you with your life?* . Second, *How satisfied are you with your job?* The answers to these two question

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are categorized as: 1. Very satisfied ; 2. Fairly satisfied 3. Not satisfied 4. Not at all satisfied. We have observed that few categories do not have enough representative sample, therefore, by logical understanding, we have were further categorized these two questions into binary form: "Satisfied – 1" , and "Not satisfied – 0". Since dependent variable is in binary, we have used logit regression model to estimate job satisfaction, and life satisfaction.

Logit(p) $\log\left(\frac{p}{1-p}\right) = â_0 + â_{ct}(x_{ct}) + â_k(_{k(cov)})$ …… equation (2)

Where the notation are as follows:

$\left(\frac{p}{1-p}\right) = p$ is the probability of the dependent variable job satisfaction as being 1

x_{ct} stands for commute time to work

$s_{k(cov)}$ stands for all covariates such as mode of transport, work experience, gender, house ownership, age, sector of employment

$_0$ is the intercept or constant term ; $_{ct}$ is coefficient of commute time, while $_k$ stands for coefficients of each explanatory variable

Results

Commute Time to Work and Background Characteristics of Respondents

The results of the bi-variate analysis shows that commuting time is strongly associated with life satisfaction and job satisfaction with p value of chi-square less than 0.001 (table 1). It is noticeable that life satisfaction has declined gradually along with increasing time spent on commuting, unlike job satisfaction, which initially increased with increasing commuting time. We can say that the relation between commuting time and job satisfaction is not as direct as life satisfaction. It shown that higher percent of commuters travelling 15 to 30 minutes are more satisfied with their job than the one who spent less than 15 minutes. It could possibly the due to the workers with less paying jobs are closer to the workplaces. Low income workers often stays closer to the workplace in order to minimize the cost of travelling. These results were supported by the sector model given by Homer Hoyt, where he emphasize that low-income workers reside close to the employment locations.

Another important relationship found between type of house ownership and commuting time. House ownership type is related to job satisfaction but not life satisfaction. It was found that majority of the workers staying in rented house reported to have higher satisfaction both in life and job. Finding cheaper accommodation closer to the workplace would lead to lesser commuting time. Thus, may points to easy access to workplace, which in turn might plays an important role in the level of job satisfaction. It was also observed that workers with permanent accommodation (own house) find it difficult to change their residence closer to the workplace,

The social category of an individual and the job satisfaction and life satisfaction are closely related. Similar to type of house ownership, social category of an individual also shown strong relation with job satisfaction but not with life satisfaction. It was more evident in case of workers belonging to Scheduled caste (SC) and Scheduled tribes (ST), where higher proportion of them have stated job satisfaction but not life satisfaction. One of the possible reason for this could be the reservation policies in employment, which helps them to find stable job, but their social conditions still influence their life satisfaction.

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Table 1: Characteristics of the study participants based on their self-reported life and job satisfaction
(chi-square values)

Socio-Economic characteristics	Total Sample	Life satisfaction (%)		P Value	Job satisfaction (%)		P value
Gender		Not satisfied	Satisfied		Not satisfied	Satisfied	
Men	273 (72.6%)	65.6	34.4	0.189	45.05	54.95	0.812
Women	103 (27.4%)	58.3	41.7		43.69	56.31	
House ownership							
Own house	238 (63.3%)	64.7	35.3	0.546	50.84	49.16	0.002
Rent house	138 (36.7%)	61.6	38.4		34.06	65.94	
Household size							
1-2 member	57 (15.2%)	59.6	40.4	0.06	43.86	56.14	0.549
3-4 member	224 (59.6%)	60.3	39.7		42.86	57.14	
5 and above	95 (25.3%)	73.6	26.3		49.47	50.53	
Time to reach workplace							
<=15 Min	107 (28.5%)	22.43	77.57	<0.001	12.15	87.85	<0.001
15-30 Min	63 (16.8%)	69.84	30.16		1.59	98.41	
30 Min and more	83 (22.1%)	83.01	16.99		74.76	25.24	
Category of Household							
General	97 (25.8%)	62.9	37.1	0.532	41.24	58.76	0.053
OBC	183 (48.7%)	66.1	33.9		50.82	49.18	
SC and ST	96 (25.5%)	59.38	40.62		36.46	63.54	
Age of respondent							
20-30 Years	91 (24.2%)	63.7	36.3	0.949	46.15	53.85	0.483
31-40 Years	125 (33.2%)	61.6	38.4		40	60	
41-50 Years	92 (24.5%)	65.2	34.8		44.57	55.43	
51 and above	68 (18.1%)	64.7	35.3		51.47	48.53	
Sector of employment							
Education	71 (18.9%)	53.5	46.5	0.107	28.17	71.83	0.013
Health	78 (20.7%)	73.1	26.9		50	50	
Manufacturing	72 (19.1%)	59.7	40.3		43.06	56.94	
Public Administration	84 (22.3%)	61.9	38.1		45.24	54.76	
Transport	71 (18.9%)	69	31		56.34	43.66	
Total	**376 (100%)**	**63.6**	**36.4**		**44.7**	**55.3**	

(Source: Primary Data)

We have noticed strong relationship between the sector of employment and satisfaction with job, but not with life. Majority of workers employed in education sector reported job satisfaction (71.8 percent), while the lowest job satisfaction was observed among transport sector employees (43.6 percent). It was also evident in the earlier chapter, where these two sector workers exhibit different distances in reaching workplace. Employees in education sector commute shorter distance, while employees in transport sector commute

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longer distances to reach their workplace. Besides this distance to work, their nature of job is also different. Transport sector employees experience greater difficulties and everyday tasks, which may lead to this type of differences in their job satisfaction.

Commute Time to Work and Life Satisfaction

The time spent on commuting to reach workplace is classified into three groups (less than 15 min, 15 to 30 min, 30 min. and above), then within each group we have attempted to verify whether they are satisfied with their life and job (table 2 and table 3). It was found that, across all characteristics, reporting of life satisfaction is drastically declined beyond duration of 15 minutes. Men reported to show higher instability in life satisfaction with increasing time as compared to women. Among men who spent less than 15 minutes, 83 percent of them have reported that they are satisfied with their life, whereas the men who commute more than 30 minutes only 11.6 percent stated that they are satisfied with life. In case of women it is not as sharp fall as men (table 2). Similar observation found in the workers living in own house, where almost 80 percent of workers with less than 15 minutes of commute time reported that they are satisfied with their life, while it was only 18 percent among workers spending more than 30 minutes of time to reach their workplace.

It is interesting to note that workers who belong to general category are more differ in their reported level of life satisfaction along with increasing commuting time. In other words, it is found that 84.8 percent of workers belong to general category have reported that they are satisfied with their life, but it found to decline to 6.5 percent beyond 35 minutes. For instance, general category workers with satisfaction report as follows: 84.8 percent in less than 15 min, 27.8 percent in 15 to 30 minutes, 6.5 percent in more than 30 minutes. But the same scenario among SC and ST workers is as follows: 74.2 percent (less than 15 min), 30.8 percent (15 to 30 min), 23.1 percent (more than 30 minutes). Another observation in the similar line is within 15 minutes of duration, general category workers (84.8 percent) are shown higher percent of life satisfaction as compared to SC and ST category workers (74.2 percent). These numbers have changed over 30 minutes of time.

Age is one of the most important demographic variables in explaining the behaviour. It was not surprising that higher percent of aged employees reported lower life satisfaction with increasing time spent on commuting. Within the 15 minutes of commuting time, more than 80 percent of workers (aged 51 and above) reported that they are satisfied with their life but as soon as the time spent on commuting increased to more 30 minutes, their reporting declined to 16 percent. Precisely, irrespective of age, everyone had shown decreasing life satisfaction with increasing time spent on commuting, but it is more declined among workers aged 51 and above.

Similar to table 2, we have attempted to understand the job satisfaction within each category of time (e.g. <15 min, 15-30 min, >=30 min). Here we have found that within the category of 15 to 30 minutes, the reporting of not satisfying with their job is very low (table 3). In other words, it was found that workers with different characteristics found to report higher satisfaction within the category of 15 to 30 minutes of commute time. At the glance, it is pretty clearer that with increasing time spent on commuting, workers reported lower job satisfaction. It is found that within 15 minutes of commute time, higher reporting of satisfaction was observed among workers living in non-nuclear household, whereas in case of beyond 30 minutes of commute time, reporting of satisfaction is low as compared to workers of other household sizes. Unlike life satisfaction, higher percent of workers belong to SC and ST category have reported job satisfaction within the 15 minutes of commute time, while reporting of job satisfaction is lesser among general category workers in comparison to SC and ST workers within this duration.

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Table 2: Characteristics of the study participant based on their commute time to workplace and self-reported life satisfaction

	Total	Life satisfaction								
		<=15 Min			15-30 Min			>=30 Min		
		Not satisfied	Satisfied	sample distribution	Not satisfied	Satisfied	sample distribution	Not satisfied	Satisfied	sample distribution
Gender										
Men	273	16.5	83.5	79	77.1	22.9	48	88.4	11.6	146
Women	103	39.3	60.7	28	46.7	53.3	15	70	30	60
House ownership										
Own house	238	20.3	79.7	59	70	30	48	82	18	139
Rent house	138	25	75	48	69.6	30.4	23	85.1	14.9	67
Household member										
1-2 member	57	26.1	73.9	23	71.4	28.6	7	85.2	14.8	27
3-4 member	224	21.9	78.1	64	68.4	31.6	38	77.9	22.1	122
5 and more	95	20	80	20	72.2	27.8	18	93	7	57
Caste of Household										
General	97	15.2	84.8	33	72.2	27.8	18	93.5	6.5	46
OBC	183	25.6	74.4	43	68.8	31.2	32	81.5	18.5	108
SC and ST	96	25.8	74.2	31	69.2	30.8	13	76.9	23.1	52
Age of respondent										
20-30 Years	91	33.3	66.7	21	68.4	31.6	19	74.5	25.5	51
31-40 Years	125	19.4	80.6	36	55.6	44.4	18	84.5	15.5	71
41-50 Years	92	20.7	79.3	29	75	25	16	89.4	10.6	47
51 and above	68	19	81	21	90	10	10	83.8	16.2	37
Sector of employment										
Education	71	74.2	25.8	31	65	35	20	85	15	20
Health	78	14.3	85.7	14	91.7	8.3	12	84.6	15.4	52
Manufacturing	72	21.7	78.3	23	57.1	42.9	14	85.7	14.3	35
Public Administration	84	21.7	78.3	23	72.7	27.3	11	78	22	50
Transport	71	25	75	16	66.7	33.3	6	83.7	16.3	49

(Source: Primary Data)

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Table 3: Characteristics of the study participant based on their commute time to workplace and self-reported job satisfaction

	Total	Job satisfaction								
		<=15 Min			15-30 Min			>=30 Min		
		Not satisfied	Satisfied	sample distribution	Not satisfied	Satisfied	sample distribution	Not satisfied	Satisfied	sample distribution
Gender										
Men	273	10.1	89.9	79	0	100	48	78.8	21.2	146
Women	103	17.9	82.1	28	6.7	93.3	15	65	35	60
House ownership										
Own house	238	11.9	88.1	59	2.5	97.5	48	81.3	18.7	139
Rent house	138	12.5	87.5	48	0	100	23	61.2	38.8	67
Household member										
1-2 member	57	21.7	78.3	23	0	100	7	74.1	25.9	27
3-4 member	224	10.9	89.1	64	2.6	97.4	38	72.1	27.9	122
5 and more	95	5	95	20	0	100	18	80.7	19.3	57
Caste of Household										
General	97	18.2	81.8	33	0	100	18	73.9	26.1	46
OBC	183	11.6	88.4	43	3.1	96.9	32	80.6	19.4	108
SC and ST	96	6.5	93.5	31	0	100	13	63.5	36.5	52
Age of respondent										
20-30 Years	91	9.5	90.5	21	5.3	94.7	19	76.5	23.5	51
31-40 Years	125	5.6	94.4	36	0	100	18	67.6	32.4	71
41-50 Years	92	13.8	86.2	29	0	100	16	78.7	21.3	47
51 and above	68	23.8	76.2	21	0	100	10	81.1	18.9	37
Sector of employment										
Education	71	19.4	80.6	31	0	100	20	70	30	20
Health	78	7.1	92.9	14	8.3	91.7	12	71.2	28.8	52
Manufacturing	72	13	87	23	0	100	14	80	20	35
Public Administration	84	4.3	95.7	23	0	100	11	74	26	50
Transport	71	12.5	87.5	16	0	100	6	77.6	22.4	49

(Source: Primary Data)

Association between Commute Time, Job and Life Satisfaction

The results of the unadjusted binary logistic regression shows that, as compared to the commuters who travels less than 15 minutes, commuters who travel for 15 minutes and above are less likely to be satisfied with their life (table 4). In case of job satisfaction, it was found that as compared to commuters who travel less than 15 minutes, those who travel more than 30 minutes are less likely to have job satisfaction but the one who travel in between 15 to 30 minutes are more likely to have job satisfaction. The reasons behind this could be associated with overburden of work, low wages.

Table 4: Unadjusted odds ratio for commute time and job and life satisfaction

	Model 1 Job satisfaction			Model 2 Life satisfaction		
	odds ratio	95% class lower limit	95% class upper limit	odds ratio	95% class lower limit	95% class upper limit
Commute time						
<=15 min®						
15-30 min	2.15*	0.09	4.21	-2.08***	-2.78	-1.38
>=30 min	-3.06***	-3.72	-2.40	-2.83***	-3.41	-2.25

Legend: * p<.05; ** p<.01; *** p<.001

The daily time spent on commuting to reach workplace has great impact on both job satisfaction and life satisfaction (table 5). It was found that the after adjusting with other independent variables, initially

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workers who spent 15 to 30 minutes commute time are more likely to have job satisfaction but declined beyond 30 minutes. Moreover, workers who are living in rented house are almost 2 times more likely to have job satisfaction as compared to the workers who live in own houses. The household size with living 3-4 member having 1.98 times higher odds of life satisfaction (95% CI: 0.072 - 5.42). whereas, household living with 7-8 members having 0.14 times lower odds of life satisfaction, but the there is no significant association (95% CI: 0.01 - 2.04). with the age as aged 50 and above 0.92 times lower odds of life satisfaction and but not significantly associated (95% CI: 0.33 - 2.54).

In the Model-2 with life satisfaction association between the commuting times, it depicts that increasing commuting time decreases life satisfaction. For instance, as compared to the workers who commuter short duration (less than 15 min), those who spent 15-30 min and beyond 30 minutes are less likely to have life satisfaction. It was also found that type of house ownership does not have any significant association with life satisfaction. It is interesting to note that work experience is significantly associated with life satisfaction but not with job satisfaction. Perhaps, women tend to have higher life satisfaction and job satisfaction as compare to men, but there is no significant association. The sector of employment has found to associate with job satisfaction and life satisfaction but didn't find any In the employment sectors health and public administration tend to be higher life satisfaction compare to those employed in education sectors.

Table 5: Adjusted logistic odds ratio for commute time and job and life satisfaction

	Model 1 Job satisfaction			Model 2 Life satisfaction		
	odds ratio	95% class lower limit	95% class upper limit	odds ratio	95% class lower limit	95% class upper limit
Commute time						
<=15 min®						
15-30 min	10.47*	1.31	15.79	0.12***	0.05	0.24
>=30 min	0.05***	0.02	0.11	0.06***	0.03	0.11
Mode of transport						
Any other®						
Public transport	0.25*	0.07	0.87	0.59	0.21	1.65
Personal vehicles	0.45	0.14	1.45	0.73	0.31	1.76
Work experience						
<5 years®						
5-10 years	0.95	0.46	2.00	2.10*	1.07	4.14
>10 years	0.93	0.38	2.28	0.92	0.40	2.12
House ownership						
Own house®						
rented house	2.13*	1.16	3.89	0.72	0.41	1.26

Legend: * p<.05; ** p<.01; *** p<.001 ; Note1: Results were controlled for gender, age, industry of employment

Note2: Any other mode includes – walk, auto, cycle

Discussion

The study shows that with increasing commuting time, both life and job satisfaction decreases. Workers who commute less than 15 minute reported higher levels of satisfaction in both job and life. Whereas commuting

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time increase to 30-45 minute, the odds of life satisfaction decrease by 0.06 times. Moreover, the impact of commuting time on job and their life satisfaction is robust and independent of others factors included in the study. This finding is support with the literature suggesting that longer commuting time can increase the stress, affect mental health, and reducing overall well-being and leisure time (Hansson, et.al, 2011; Clark, et.al, 2020). Secondly, gender and commuting are highly associated with level of satisfaction. The findings revels that men have higher level of satisfaction with their jobs compared to women. Also, a higher percent of men report longer commuting times compared to women. Thirdly, the household ownership depicts that living in rented house is associated with slightly higher level of job satisfaction compared to living in an owned house. Possibly rented house are located to closer to the workplaces.

Furthermore, commuters aged 51 and above have reported lower life satisfaction than younger one. This could possibly related to the prolonged work stress, and fragile to work environment, health issues, long working hours, and other responsibilities at home. Moreover, the sector of employment also play a significance role in the level of satisfaction. Workers employed in the health and public administration sectors reported higher levels of job satisfaction compared to those employed in the education sector. Reading the scenario through social category lens, deprivation in life and job satisfaction is observed among the individuals belonging to SC and ST category. This finding highlights the importance of addressing the transport, and residential inequalities to ensure overall well-being and satisfaction among all segments of society.

Conclusion

Certainly, commuting has a significant impact on level of stress and overall satisfaction, which is linked to SDG-3 (Ensuring health and well-being) and SDG-11 (Sustainable cities and communities). Long commuting times can have adverse effects on health and well-being. Therefore, providing better transportation, cycling lanes, and pedestrian-friendly infrastructure, as targeted by SDG-11.2, can reduce stress level among commuters. Based on all the findings, it concludes that the government of India should implement policies such as illuminating roadway's, reducing street congestion, maintaining existing sidewalk for the elderly and children, and improving the frequency of public transport at affordable prices. This measure could enhance commuter's satisfaction level regarding health and well-being.

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