Time allocation to daily performed Personal activities in association with commuting: commuting and health perspective of Baluchistan

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Abstract

To get out from dwelling for any kind of work needs to commute. Increasing commute decreases the time to perform activities other than commute. This study analyzes the relation between daily performed personal activities and commuting time in the Baluchistan. The primary focus of the study is on six different types of personal activities: active leisure, passive leisure, religious, physical, personal care and sleep. The study uses Pakistan Time Use Survey (2007) data, obtained from Federal Bureau of Statistics government of Pakistan. This research employed a seemingly unrelated regression model to the data using several demographics characteristics of respondents as covariates. The study has quantified the impact of commuting on daily performed personal activities. The model results reveal that as the level of education increases, the time consumption on daily physical activities decreases significantly. The people doing their own business are going to spend more 8.173 minutes on religious activities as compared with employee salary/wage dependent people. The commuting effects turned to be more pronounced for male and people who are currently married. Study results reveals significant but negative impact of commute on the activities performed by individuals in the province under study.

Keywords: Personal Activities, Time Allocation, Commute, Health, Baluchistan

Introduction

To get out from dwelling and come back to dwelling for any kind of work need to commute. Notwithstanding that some of the benefits are associated with commuting but commuting has negative quantitative effect of time on theperformance of other activities. A broad array of perspectives has been informed by research done on commuting(Novaco& Gonzalez, 2009).Numerous studies done previously have found commuting to be negatively related to aspects of personal wellbeing such as life satisfaction (Stutzer and Frey 2008). Commuting is negatively associated with various measures of mental health and well-being (Robert, Hodgson and Dolan 2009).

The focus of present study is on six different activities considered as personal activities such as religious activities, active leisure, passive leisure, personal care, sleep and physical activities. And also, commuting and work-related activities are taken as explanatory factors to these personal activities described earlier. However,it is right to assume that these personal activities have a close relationship with individual's well-being. The study has found a negative relationship between commuting activity and all these personal activities except active leisure activities.

It is common in each and every society that peoples are usually associated with different kinds of religious activities and practices. Religious activities and practices mostly are performed on daily basis. This study has categorized religious activities and practices as separate activityto find out the effect of commuting to it. As religions give hopes to the followers, many studies have found significant impact of religious involvement on mental health and well-being. Ellison et al., (2001) found religious involvement such as church attendance, has a positive effect on well-being and negative effect on distress. Depression and anxiety are linked with religiosity and religiosity has a wide range of positive impact on mental health and psychological well-being (Ellison 1991; Levin,Thomas & Holmes,1992). The activity related to leisure is divided into two mutually exclusive leisure activities such as active leisure and passive leisure. Leisure activity is referred to free and spare time which every individual consumed on its preferences. Quality and quantity of leisure hours is also associated with well-being. Because of commuting time, lesser time devoted to physically active leisure and experiences of traffic congestion negatively affect well-being (Hilbrecht, el al., 20014).Participation in leisure related activities is associated with greater life satisfaction, happiness and psychological well-being, and physically active leisure

can moderate the detrimental effects of stress (Iso-Ahola, 1997).Time trade-offs between work, family and leisure reflect time allocation influenced by individual preferences, biological needs, social roles and related commitments (Michelson, 2005). The leisure reduces the stressful work situations (Iwasaki, 2003). Therefore, the pleasant opportunities to spent leisure hours can be a tool to reduce stress for people with longer or stressful commutes. By looking at various discussion, it can be concluded that leisure plays a significant role in well-being. Leisure provide health benefits for workers experiencing time pressure and job instability (Cartwright & Warner-Smith, 2003).Sleeping duration is one of the important indicators of individual'shealth status. The results reflect that longer commute reduces the time to sleep.Commuting by car (passive commuting) is associated with poor sleep quality, lower the self-assessed health levels and higher the rate of obesity (Frank, Andresen, & Schmid, 2004; Hansson et al., 2011). Physical activity considered as a personal activity that is also associated with well-being. Active commuting had an inverse and significant association with heart failure risk in women, but not in men (Wang el al., 2010). The results of a cohort study conducted inDenmark reveal that cycling to work was inversely associated with all causes of mortality (Andersen et al., 2000).

Data and Methodology

The research design of this study is secondary data analysis. The data evaluated in this study is taken from Federal Bureau of Statistics Government of Pakistan. By focusing on the research topic, the respondent from Baluchistan are considered and the check on data deleted 32,945 individuals belonging to other than Baluchistan province. The people below the age of 15 and above 65 were also dropped down. And the people with zero or didn't report or refused to report their labor/working time were also dropped from the study. After taking these necessary checks, 1,929 individuals were left behind and is consider as a study sample.

Statistical Tools

Two types of statistical analysis were used to analyze the study sample bivariate analysis and seemingly unrelated regression analysis (SUR)

Seemingly Unrelated Regression model (SUR):

SUR model was proposed by Arnold Zellner (1962). Model explains the variation not only in one dependent variable but a set of "k" dependent variables. The SUR model consists of several linear regression equations, each equation is provided by its own dependent variable and different sets of explanatory variables. Each equation can be estimated separately that is why the

system is called Seemingly Unrelated Regression. The SUR model is a system of linear equations with error and error are correlated across equation for a given individual but these are uncorrelated across individuals. The main difference between Simultaneous Equation Models (SEM) and SUR model is that SEM contains both endogenous and exogenous regressors while SUR Model contains only exogenous regressors. The parameters in the SUR model generally vary from equation to equation. While regressors may or may not vary from equation to equation depending on the model.

For this study a unique set of regressors such as Respondent's Sex, Respondent's age, current marital status, Source of personal income, the day of week for which activities recorded, highest school grade/class/ standard that is passed, Total time spent on working/labor time in minutes, and Total time spent on daily commute in minutes are taken to evaluate the impact of these variable on six different dependent variables including total time spent on daily religious activities, total time spent on daily active leisure, total time spent on daily passive leisure, total time spent ondaily personal care, total time spent on daily sleep and total time spent on daily physical activities. The general form of SUR model is given by

$$Y_{it} = \beta_1 + \beta_2 X_{2t} + \beta_3 X_{3t} + \beta_4 X_{4t} + + \beta_5 X_{4t} + \beta_4 X_{6t} + \beta_4 X_{7t} +$$

$$\beta_4 X_{8t} + \beta_4 X_{9t} + \varepsilon_{it} \text{------------(1)}$$

Table 1: Descriptive Statistics

Activity	Description	Overall	0	1-60	61-120	121-180	181-240	>240
Religious Activities	Mean time spend	34.8	35.9	33.9	31.9	41.9	38.6	33.2
Active Leisure	Mean time spend	5.7	0.7	3.8	7.3	8.3	11.6	0.8
Passive Leisure	Mean time spend	146.6	108.7	136.9	158.6	170.1	155.5	114.3
Physical Activity	Mean time spend	59.9	200.5	37.4	39.8	50.8	60.9	51.9
Work Related	Mean time spend	316.3	141.2	387.4	345	261.2	247.6	206.8
Sleep	Mean time spend	513	523.8	517.1	512.6	508.8	490.4	477.6
Travel time	Mean time spend	96.6	0	53.4	108.1	163	223.2	342.2

Table 1 has 9column, first column presents activities second description of each activityand third column presents overall mean time spent on each activity. And forth, fifth, sixth seventh, eighth and ninth column presents mean time spent on each activity provided that zero minutes spent on commuting, mean time spent on each activity given that daily commute range form 1-60 minutes, average time allocation to each activity under commuting time range from 61-120,

mean time spent on each activity provided that 121-180 minutes spent on commuting,mean time spent on each activity provided that 181-240 minutes spent on commutingand mean time spent on each activity provided that more than 240 minutes spent on commutingrespectively.

It is clear from the above table that overall daily time spent on religious practices in Balochistan is 34.8 minutes. Therefore, the time spent on daily religious activities is lower than overall average in two least and in one higher commuting category and it is higher in 121-180 and 181-240 commuting time category. Overall 5.7 minutes are spent in daily active leisure and the results suggest that time spent on active leisure is critically low in Baluchistan. There are 146 minutes spent on daily passive leisure and the people who commute from 121 to 180 minutes spent 170.1 minutes in passive leisure. The overall time devoted to daily physical activity in Baluchistan on is 59.9 minutes and it jumps over the average up to 200.5 minutes for the people who do not commute. There are 316.3 minutes spent overall on daily work-related activities and the people who commute from 1-60 minutes spent 387.4 minutes in work related activities. The overall daily sleeping time in Baluchistan is 513 minutes and the people with zero commute sleep more than overall average and the people who commute. The people in Baluchistan daily commute 96.6 minutes on average.

Table 2: Percentage distribution of respondent's characteristics (n=1929)

	Description	Overall	0	1-60	61-120	121-180	181-240	>240
Respondent's age	Mean age in Years	35	33	35	35	36	35	40
Male	=1 if respondent is male	84.3%	2.40%	27.40%	33.20%	14.50%	4.90%	1.90%
Female	=1 if respondent is female	15.7%	8.80%	5.30%	1.20%	0.20%	0.20%	0%
Never married	=1 if respondent is married	20.5%	1.20%	6.80%	7.60%	3.40%	1.30%	0.20%
Currently married	=1 if respondent is c.married	78.2%	9.60%	25.40%	26.70%	11.00%	3.70%	1.80%
Widow	=1 if respondent is widow	1.2%	0.30%	0.50%	0.20%	0.20%	0.10%	0%
Wages/salary	=1 if respondent is employee	43%	2%	13.80%	17.70%	6.70%	2.10%	0.70%
Business	=1 if respondent is business man	40.4%	1.70%	15.10%	14.20%	6.10%	2.30%	0.90%
Dependent on household	=1 if respondent is dependent on household	13%	6.50%	2.90%	1.70%	1.40%	0.40%	0.10%
Other	=1 if respondent is other	3.60%	0.90%	0.80%	0.90%	0.50%	0.30%	0.20%
Monday	=1 if respondent is interviewed on Monday	16.40%	2.30%	5.20%	5.40%	2.40%	0.80%	0.30%
Tuesday	=1 if respondent is interviewed on Tuesday	18.70%	2%	7.50%	5.90%	2.10%	0.90%	0.30%
Wednesday	=1 if respondent is interviewed on Wednesday	16.50%	1.80%	5.00%	5.90%	2.60%	0.90%	0.30%
Thursday	=1 if respondent is interviewed on Thursday	13.30%	1.40%	4.30%	4.10%	2.10%	0.80%	0.40%
Friday	=1 if respondent is interviewed on Friday	10.90%	0.90%	3.20%	3.90%	1.90%	0.60%	0.40%
Saturday	=1 if respondent is interviewed on Saturday	11.80%	1.20%	3.90%	4.30%	1.70%	0.50%	0.10%
Sunday	=1 if respondent is interviewed on Sunday	12.40%	1.40%	3.60%	4.90%	1.80%	0.50%	0.20%
No formal education	=1 if respondent is illiterate	49.80%	8.50%	16.60%	15%	6.30%	2.40%	0.90%
below primary	=1 if respondent is educated below Primary	7%	0.40%	2.60%	2.30%	1.10%	0.30%	0.20%
below middle	=1 if respondent is educated below Middle	10.40%	6.70%	3.90%	4.00%	1.50%	0.20%	0.10%
below matric	=1 if respondent is educated below Matric	8.10%	0.20%	2.20%	3.70%	1.40%	0.50%	0.20%
below inter	=1 if respondent is educated below intermediate	10.50%	0.70%	3.40%	3.60%	1.70%	1%	0.20%
below degree	=1 if respondent is educated below Degree	8.30%	0.50%	2.20%	3.40%	1.60%	0.50%	0.20%
Degree above	=1 if respondent is educated up to degree and above	5.80%	0.20%	1.90%	2.40%	1%	0.20%	0.10%
Quetta	=1 if respondent is from Quetta	24.70%	2.80%	8.30%	8.50%	3.30%	1.40%	0.30%
Kalat	=1 if respondent is from Kalat	21%	2.30%	6.50%	7.60%	2.90%	1.10%	0.60%
Zhob	=1 if respondent is from Zhob	17%	1.60%	5.30%	6.70%	2.30%	0.60%	0.50%
Makran	=1 if respondent is from Makran	13.20%	1%	4.80%	4.10%	2.20%	1%	0.20%
Nasirabad	=1 if respondent is from Nasirabad	12.30%	1.90%	4.10%	3.70%	1.70%	0.60%	0.20%
Sibi	=1 if respondent is from Sibi	11.80%	1.60%	3.60%	3.80%	2.10%	0.40%	0.20%

Table 2 shows that the overall average age of respondents is 35 years and the average age of people who did not commute is 33 years. And people with more than 240 minutes daily commuting time are 40 years old on average. Overall 84.3 percent of the respondents are male.

The proportion of female respondent (8.8%) is higher in zero minutes commuting time category as compared with male (2.4%). The results indicate that people in Balochistan usually commute in shorter duration as proportion of people in longer commuting duration is very low. Results from table 2 also shows that 78.2 % of the overall respondent are currently married and they are appeared to be greater in proportion in commuting time categories as compared to never married and widowed. The overall percentage of respondents shows that majority (18.7%) is interviewed on Tuesday. Tables shows that 49.80 of total respondents have no formal education and illiterate peoples in Balochistan commute more as compared to literate respondent as shown in the results. Majority of the respondent are from Quetta i.e. 24.7% and the proportion of commuters is higher in commuting time categories as compared to other cities in Balochistan.

Table 3 Model Descriptive Statistics

Equation	Obs	Parms	RMSE	"R-sq"	chi2	P
Religious Activity	1929	25	45.17916	0.0487	98.76	0.00
Active Leisure	1929	25	27.94688	0.0602	123.66	0.00
Passive Leisure	1929	25	92.36652	0.2769	738.62	0.00
Personal Care	1929	25	90.77706	0.4453	1548.29	0.00
Sleeping Activity	1929	25	89.25115	0.1437	323.76	0.00
Physical Activity	1929	25	81.29068	0.4321	1467.83	0.00

Table 4 SUR Model

	Coefficient	Std. Err.	[95% Conf. Interval]		Coefficient	Std. Err.	[95% Conf. Interval]		Coefficient	Std. Err.	[95% Conf. Interval]	
Religious Activities					Active Leisure				Passive Leisure			
Commute	-0.003	0.017	-0.037	0.031	0.0018	0.011	-0.02	0.022	-0.185**	0.036	-0.254	-0.115
Working time	-0.024**	0.006	-0.036	-0.011	-0.021**	0.004	-0.029	-0.013	-0.287**	0.013	-0.313	-0.261
Age	0.542**	0.113	0.32	0.764	-0.064	0.07	-0.201	0.073	0.032	0.232	-0.422	0.486
2.Gender	-0.827	4.065	-8.795	7.14	-16.453**	2.515	-21.381	-11.524	-110.702**	8.311	-126.992	-94.413
2. marital status	0.455	3.163	-5.744	6.654	-4.336*	1.956	-8.17	-0.501	-11.321	6.466	-23.994	1.352
3	9.287	10.167	-10.64	29.213	-7.519	6.289	-19.845	4.808	5.767	20.786	-34.972	46.506
2.Income source	8.173**	2.369	3.53	12.816	-1.575	1.465	-4.447	1.297	-3.035	4.843	-12.528	6.458
Dependent on household	-2.324	4.194	-10.544	5.897	12.219**	2.595	7.133	17.304	-12.521	8.575	-29.328	4.286
Other	12.717	15.412	-17.49	42.925	-9.477	9.534	-28.163	9.209	-3.982	31.51	-65.74	57.775
2.interveiw day	-0.000	3.491	-6.843	6.843	1.658	2.160	-2.575	5.891	-3.876	7.138	-17.867	10.115
3	6.085	3.602	-0.976	13.145	0.032	2.228	-4.336	4.399	-8.684	7.365	-23.119	5.751
2,Eucation	-2.423	4.22	-10.694	5.848	1.864	2.61	-3.252	6.981	9.714	8.628	-7.196	26.623
Below middle	-1.343	3.606	-8.41	5.724	-1.528	2.23	-5.899	2.844	-1.945	7.372	-16.394	12.503
Below matric	-4.682	3.996	-12.514	3.149	1.986	2.472	-2.859	6.831	15.467	8.169	-0.545	31.479
Below inter	-2.412	3.632	-9.531	4.707	-0.353	2.247	-4.757	4.051	26.840**	7.426	12.285	41.394
Below degree	-0.991	4.016	-8.861	6.88	4.359	2.484	-0.509	9.228	20.950*	8.21	4.859	37.04
Degree or above	-3.906	4.683	-13.085	5.273	6.017*	2.897	0.339	11.695	53.792**	9.575	35.026	72.558
_cons	22.252**	5.928	10.633	33.871	18.039**	3.667	10.851	25.226	277.372**	12.12	253.618	301.127
Personal Care					Sleeping Activities				Physical Activities			
Commute	-0.390**	0.035	-0.458	-0.321	-0.268**	0.034	-0.336	-0.201	-0.116**	0.031	-0.177	-0.055
Working time	-0.264**	0.013	-0.29	-0.238	-0.178**	0.013	-0.203	-0.153	-0.216**	0.012	-0.239	-0.193
Age	0.501*	0.228	0.055	0.947	-0.046	0.224	-0.485	0.393	-0.660**	0.204	-1.059	-0.26
2.Gender	98.476**	8.168	82.467	114.48	-36.518**	8.031	-52.258	-20.779	72.591**	7.314	58.255	86.927
2. marital status	19.619**	6.355	7.164	32.074	-22.165**	6.248	-34.411	-9.92	24.104**	5.691	12.951	35.258
3	22.417	20.428	-17.621	62.455	1.076	20.085	-38.289	40.441	-33.375	18.293	-69.229	2.479
2.Income source	10.085*	4.76	0.756	19.415	-2.155	4.68	-11.328	7.017	-3.496	4.263	-11.85056	4.858776
Dependent on other household	-17.015*	8.427	-33.533	-0.498	-29.859**	8.286	-46.099	-13.619	22.579**	7.547	7.787612	37.37043
Other	-24.39	30.967	-85.086	36.305	74.126*	30.447	14.451	133.801	-10.296	27.731	-64.64853	44.05627
2.interveiw day	-0.755	7.015	-14.505	12.995	5.174	6.898	-8.345	18.693	0.642	6.282	-11.67144	12.95488
3	2.188	7.238	-11.999	16.375	16.614*	7.117	2.666	30.563	-9.993	6.482	-22.69677	2.711619
2,Eucation	0.574	8.479	-16.044	17.193	-7.572	8.337	-23.911	8.768	-6.154	7.593	-21.03545	8.728412
Below middle	2.094	7.245	-12.106	16.294	7.748	7.123	-6.213	21.709	-15.697*	6.488	-28.41287	-2.981421
Below matric	-8.307	8.029	-24.043	7.429	7.62	7.894	-7.851	23.092	-21.640**	7.19	-35.73135	-7.547689
Below inter	-11.737	7.298	-26.04	2.567	-3.087	7.175	-17.15	10.977	-28.701**	6.535	-41.51005	-15.89192
Below degree	-11.369	8.068	-27.183	4.445	10.825	7.933	-4.723	26.373	-34.869**	7.225	-49.03053	-20.70783
Degree or above	-40.252**	9.41	-58.696	-21.809	6.287	9.252	-11.846	24.42	-39.596**	8.427	-56.11221	-23.08041
Constant	347.603**	11.911	324.257	370.95	609.903**	11.711	586.949	632.856	146.946**	10.667	126.0399	167.8522

Table 4 present the analysis of SUR model. Table shows that the daily commuting time and religious activities are negatively associated but the association is not statistically significant. The average time spent on daily religious activities is 22.252 while controlling other factors for zero in the model. The association between religious activities and working time is positive and significant. Every single minute increase in working time is associated with a decrease of 0.024 minutes in performance of daily religious activity while keeping rest of the factors constant. Respondent's age has positive and significant impact on religious activities. Every increasing year in age is associated with increase of 0.542 minutes in daily performance of religious activity. The people doing their own business are going to spend more to time i.e. 8.173 minutes on daily religious activities as compared with employees and the coefficient is statistically highly significant.By default, time spent on daily active leisure is 18.039 in Balochistan. Active leisure has negative and highly significant association with working time. There is a decrease 0.021 minutes in daily active leisure time due to a minute increase in working time. Female in Baluchistan spent 16.453 minutes less on daily active leisure as compared to male respondents and the coefficient is highly significant. Currently married individuals spend 4.336 minutes less on daily active leisure as compared with never married respondents and the coefficient is statistically significant. The monetary dependence on other household's coefficient is highly significant and shows that the people who depend on other households, spend 12.219 more minutes on daily active leisure as compared to the respondents who are employees. The respondents educated up to degree or above spend 6.017 minutes more on active leisure as compared illiterate. People in Baluchistan spent on average 277.372 minutes on daily passive leisure while controlling all factors for zero in the model. Commuting time has a negative relationship with passive leisure and the coefficient is statistically highly significant. The coefficient on commuting time shows that there will be a decrease about 0.185 minutes in passive leisure as commuting time increases by one minute. Working time is negatively and significantly associated with passive leisure. Female respondents spend about 110.702 less minutes on daily passive leisure compared with male and the coefficient is highly significant. The respondents educated up to matric, intermediate and degree/above degree spend26.840 minutes,20.950 minutes and53.792 minutes more on daily passive leisure respectively. The intercept of equation for personal care shows that the respondents spend on average 347.603 minutes on daily personal care. Personal care has highly significant but negative relationship

with commuting time and working time. If commuting time increase by one minute, there will be 0.390 minutes decrease in personal care time on daily basis. The female respondents appear to be keener in personal care as they spend 98.476 minutes more in personal care on daily basis as compared to male respondents. Currently married respondents spend daily19.619 minutes more on personal care as compared to never married. A single year of age is associated with 0.501 minute increase in daily personal care. Respondents doing their own business spend 10.085 minutes more on daily personal care as compared to the respondents who are employed. The dependent respondents on other household give 17.015 minutes less to daily personal care as compared to employees. The respondents educated up to intermediate spend 40.252minutes more on daily personal care and the coefficient is statistically highly significant. The intercept of sleeping activities equation indicate that the people in Baluchistan spend on average 609.903 minutes on daily sleep.Daily sleeping time has inverse but highly significant relationship with daily commuting time and working time. Keeping rest of factors constant, there will be a decrease of about 0.268 minutes in daily sleeping time if commuting time increases by one minute. Female respondents sleep 36.518 minutesdaily less as compared to male. The currently married couples sleep about 22.165minutes less as compared to never married respondents. While controlling the other factors, the model results show that the people in Baluchistan sleep 609.903 minutes on daily basis. Average time spent on daily physical activities is 146.946 minutes while controlling all the factor in the model for zero. Physical activities also have a negative and highly significant association ship with daily commuting and working time. Female respondents spend 72.591 minutes more on daily physical activities as compared to the male. Every increasing single year of age is associated with a decrease of 0.660 minutes in daily physical activities. The model results reveal that as the level of education increases the time consumption on daily physical activities decreases significantly.

Table Time Association between Commute and Personal Activities

Commuting time	Religious Practices	Active Leisure	Passive Leisure	Personal care	Sleeping Activity	Physical Activity
30	0.272	-0.350	3.613	4.146	1.539	5.432
60	_____	_____	_____	_____	_____	_____
90	-0.272	0.350	-3.613	-4.146	-1.539	-5.432
120	-0.543	0.700	-7.226	-8.293	-3.077	-10.865
150	-0.815	1.050	-10.839	-12.439	-4.616	-16.297
180	-1.086	1.400	-14.452	-16.585	-6.155	-21.730

| 240 | -1.629 | 2.100 | -21.677 | -24.878 | -9.232 | -32.595 |

After estimating Sur model, marginal means for each activity are calculated and then these means are further used to figure out the effect of increasing commute on other activities while taking 60 minutes commuting time as a baseline. If the commute decreases from 60 to 30 minutes, the daily time to perform religious activity increases by 0.272 minutes on average while taking other factors constant. As it is clear from the table that as the commute increases, the time to perform religious activity decreases. Religiosity has a positive impact on mental health and psychological well-being (Ellison 1991; Levin, Thomas & Holmes 1992). Several research literature reviews over the years have pointed out that religious involvement aspects are associated with desirable mental health outcomes (Ellison & Levin 1998; Larson et al. 1992). The lesser time to perform religious activities will affect the general health and well- being of peoples in Baluchistan. The results also show a positive association between active leisure and commuting time as commute reduces by 30 minutes from 60 minutes, daily active leisure is reduced by 0.350 minutes on average.The relationship between commuting time and passive leisure is negative. If the daily commuting time increases from 60 to 90 minutes then daily passive leisure is reduced by 3.613 minutes while taking other factors constant. It is clear from the table as commuting time increases further the daily time to perform passive leisure decreases. There is an increase of about 4.416 minutes in daily personal care time as the commute decreases by 30 minutes form 60 minute keeping rest of the factors constant. Further the results highlight that daily sleeping time is inversely associated with commuting time and as the daily commute increases, the daily sleeping time decreases accordingly. Commuters are observed to sleep less time in the United State and Italy (Walsleben et al., 1999; costa et al., 1988). The health outcomes are associated with commuting such as perceived poor sleep quality, exhaustion and low self-rated health (Hansson et al., 2011). Thelong run Poor quality of sleep may affect the mental and psychological heath of commuters that will contribute to obesity or overweight. Furthermore, daily physical activity is negatively associated with commuting time. The results indicate that there is a decrease of 10.865 minutes' in daily physical activity's time as the commuting time increases by 60 minutes (i.e. from 60 to 120). The physical in-activity is associated with overweight (Xu et al., 2010). Physical activity found to be highly correlated with physical fitness, as measurement of maximum oxygen uptake (Albanes et al., 1990; Andersen et

al., 2000).Physical activity reported as a protective factor against heart failure in men ((Kenchaiah et al., 2009; Djousse et al., 2009). The lower rate of daily physical activity causes obesity that will result in a poor health in the long run. And physical in-activity may cause the heart related diseases and heart failure in Balochistan.

Conclusion and policy implications

The study explores that how people allocate their daily time budget to different personal activities. To achieve this goal a sample of 1929 individuals from all over the Balochistan is constructed from Pakistan time use survey (2007). By employing seemingly unrelated regression, the study has found significant reductions in daily performed personal activities due to increasing commute. Only one activity i.e. active leisure appeared to be a positively related with commuting time.

To evaluate the overall impact of commuting on public health, more health-related hypothesis should incorporate.However, for recent times the up to date data is required to explore the daily time budget and its allocation to different activities in Pakistan. The focus of this study is on six different activities considered as personal activities, for further research household-based activities also can be considered along with these activities which an individual performs.

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