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THE EFFECTS OF EDUCATION ON THE MAJOR LIFE ACTIVITIES OF ROAD TRAFFIC INJURY VICTIMS CONCERNING HEALTH SATISFACTION STATUS

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Abstract

Purpose of the study: To examine the satisfaction of the health status of RTI victims and to measure the association between the satisfaction of health status with the prevailing level of participation of RTI victims in various major life activities.

Methodology: This study follows a cross-sectional research design. A comprehensive interview schedule was designed and pre-tested before the actual process of data collection. For data analysis, SPSS v.20 was run for obtaining univariate, bivariate, and multivariate analysis.

Main Findings: At a bivariate level, it was found that RTI victims were having difficulty in walking, standing, sitting, and dysfunctional memory status had significantly associated with low health satisfaction. Furthermore, at the multivariate level, the victims with low educational status were more likely to report limitations in Major Life Activities (MLA), ultimately affecting their health satisfaction status.

Applications of this study: This research's findings can apply to such studies that emphasize the sociological perspectives for minimizing traffic crashes. Moreover, it also provides the role of education in controlling traffic injuries in the south Asian region.

Novelty/Originality of this study: This study is the first-ever attempt to determine the effects of MLA limitations on the health satisfaction status. Apart from describing the phenomenon from a sociological perspective, the article also enlightens the role of education in minimizing RTI injuries.

Keywords: *Major Life Activities Limitation, Health Satisfaction Status, Road Traffic Injuries, Education.*

INTRODUCTION

Road traffic crashes killed approximately 1.35 million people on roads, and 30 to 50 million become seriously injured (Konlan et al., 2020; *Global Status Report on Road Safety*, 2018). It is a global health concern worldwide projected to be the 7th leading cause of death till 2030 (World Health Organization, 2015). Furthermore, the WHO declared in 2015 that traffic injuries were the 6th highest disease burden which is ahead of AIDS and diabetes (World Health Organization, 2019). RTIs have painful physical (Ghadipasha et al., 2015; Dhondt et al., 2013), psychological (Mayou & Bryant, 2003), and social consequences (Másilková, 2017) that required adequate medical, psychological, and social treatments for the patient's full and effective health recovery.

Health is a state of complete physical, mental and social well-being, not merely the absence of a disease or infirmity (Evans et al., 2013). Health status in connection to life satisfaction could be traced in the context of subjective well-being. According to Diener (1984), subjective well-being is comprised of both affective well-being and life satisfaction. Similarly, according to Okun and Stock (1987) and Reyes Fernández et al. (2015), health status and life satisfaction are critical dimensions for studying subjective well-being, which has dramatically increased over the past few decades (Diener, 2013). However, research regarding health satisfaction status relating to people victimized in traffic crashes remains very limited; indeed, almost non-existent in Pakistan. A substantial amount of literature shows that traffic injury victims were more likely to report low or fair health status. The overall quality of life significantly reduces after RTI (Rissanen et al., 2017), and the long-term impact of injury affect the individual's life satisfaction (Jacobsson & Lexell, 2013). Furthermore, social variables like medical barriers negatively influenced the health status while better household finances, living environment, and social support positively associated (Lin & Cheng, 2019).

As Kesavayuth et al. (2015) stated, illness negatively affects individuals' health satisfaction because of various activity limitations. Similarly, RTIs also adversely affected the MLA (walking or moving outside their home unaided) of traffic victims (Alemany et al., 2013). MLA are those essential and basic functions to most people's daily lives like walking, performing manual tasks, talking, hearing, seeing, sleeping, and working (*What Are Major Life Activities?*, 2021; Rights, United States Commission on Civi, 2017). The MLA problems were significantly associated with health status dissatisfaction (Stalnacke, 2011; De Jong et al., 2011).

Besides, health satisfaction is linked to the higher socioeconomic status of people. Higher education or higher occupational status and those who dispose of more significant financial resources tend to enjoy better health at all ages (Sanderson & Scherbov, 2014; Eikemo et al., 2008). Furthermore, higher education levels were found predictors of

better functioning after the crash, while low education was associated with a lower functioning level (Walton et al., 2013; Kim, 2011).

The current literature focused more on the impact of traffic injuries on health regarding direct consequences (Polinder et al., 2015; Mashreky et al., 2010). Similarly, data concerning RTI in the police department and hospitals reflect the direct and short-term health consequences but cannot provide the long-term scenario (Berg et al., 2016; Haghparast-Bidgoli et al., 2013).

Less research focused on long-term health-related quality of life (Rissanen et al., 2020; Gopinath et al., 2017); which remains very limited, almost non-existent in the context of MLA limitations and educational status. The proposed study assessed the effects of education on the major life activities of RTI victims concerning health satisfaction status. This study portrayed various suggestions or recommendations based on study findings that will help policymakers formulate policies for the effective mainstreaming of the victims into mainstream society and their positive contribution to achieving developmental goals.

Objectives of the study

1. To examine the satisfaction of the health status of RTI victims.
2. To measure the association of MLA with HSS of the RTI victims.

METHODOLOGY

Study design

In this study "Cross-Sectional" research design was used. This design is best suited to studies aimed at finding out the prevalence of a phenomenon, situation, problem, attitude or issue, by taking a cross-section of the population. This design displays an overall picture existing at the time of the study. Such studies are called cross-sectional concerning both times of exploration and study population (Kumar, 2019).

Study Universe

The current study's universe was District Malakand of Khyber Pakhtunkhwa. Khyber Pakhtunkhwa is one of the four provinces of Pakistan. It is the 3rd largest province of the country by the size of both population and economy, though the smallest one in area. Khyber Pakhtunkhwa is divided into seven divisions and 35 districts. District Malakand is one of them, which is administratively divided into 02 Tehsil (Sama Ranizai & Swat Ranizai). Tehsil Sama Ranizai is a hilly area with an intensive road network. Due to its geographical location, this tehsil is a transit route for millions of passengers and tourists. Therefore, the roads traffic in this tehsil is bustling, particularly during summer and winter vacations, when there is a high tourist influx. Due to physical geography, high road mobility, and narrow meandering roads, the rate of Road Traffic Collision (RTC) and its associated fatalities and injuries are spiking in the area. The current study's focus was limited to RTC survivors of 12 randomly selected UC (Table 1) in tehsil Sama Ranizai of District Malakand.

Sample size and Sampling

Stratified Multistage Random Sampling was used to select a representative sample from the targeted population. Data were collected from twelve rural units (Dargai, Karkhai, Wartir, Sakhakot, Palay, Koper, Herosha, Dheri, Malakand, Gari Usmani Khel, Batkhela, and Thana Bandajat). A total of 807 fatal accidents were registered in the study area during 2018. The record for the year 2018 was obtained from the Emergency Department of District Headquarter Hospital Batkhela and Tehsil Headquarter Hospital Dargai which was completed in all respect. The Emergency Department (ED) had recently allocated a separate register for Road Traffic Accident (RTA). The record for the year 2019 was not as much completed as required for the study.

Similarly, the record for the year 2017 and before was aligned in combined registers for all types of emergencies (RTA, history of fall, burn etc.). Almost there were 25 registers stored in the record by the ED. So, finding RTAs cases in those gigantic registers was a daunting task and also time-consuming. Therefore, data for the year 2018 was selected for this study. Below is the formula for calculating sample size for the known population, as Chaudhry suggested (2009).

$$n = \frac{N\hat{p}\hat{q}Z^2}{\hat{p}\hat{q}Z^2+Ne^2-e^2}$$ (Chaudhry, 2009)

Where

N represents *Total Road Traffic Crashes* = 807,

p for *Population Portion*, which is equal to 0.50,

q = 0.50,

Z represents *Confidence Level* which is equal to 1.96,

e illustrates the *Margin of Error* which is equal to 0.043,

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Based on the above formula, the required sample size for a population of 807 traffic crash survivors was 274. These survivors bear the brunt of traffic injury in the shape of disability or functional impairment or some functional limitations. The proportion allocation of the required sample size was performed to each union council. Subsequently, the respondents were randomly selected through a simple random sampling technique. Table 1 shows the details of the proportionally allocated sample size:

The formula used for proportion allocation as under:

Each stratum sample size required:

$n_h = (N_h / N)*n$

n_h represents the required sample size for stratum *h*,

N_h illustrates the population size for stratum *h*,

N illustrates the total population size, and

n is the total sample size

Table 1: Allocation of required sample to selected Union Councils

UC Name	Population size / Total number of Crash Survivors	Sample Size
Batkhela	139	47
Dargai	120	41
Thana	56	19
Dheri	36	12
Malakand	69	23
Wartir	65	22
Kharkay	81	28
Sakhakot	62	21
Palay	73	25
Koper	35	12
Herosha	34	12
Gari Usmani	37	13
TOTAL	807	274

Source: Office record of DHQ Hospital Batkhela & THQ Hospital Dargai, 2018

Characteristics of respondents

Road Traffic Injuries (RTI) is defined as "An event that occurs on a way or street open to public traffic; resulting in one or more persons being injured or killed, where at least one moving vehicle is involved." (Sinha, 2017). All those RTI victims were included in this study who were observed with the following characteristics:

i. A person who has been injured in a traffic collision and that collision has occurred between at least one mechanical means of transportation, i.e., a collision between vehicles, vehicles, persons, animals, or buildings.

ii. Victims of RTI residing in the District Malakand region

iii. Victims of RTI that received moderate to untreatable injuries and were shifted to hospital

iv. RTI victim who felt the brunt of traffic injuries for several days, months, or years.

Study's Variables

Table 2: Study's Variables

Background Variables	Independent Variables	Dependent Variable
Educational Status	Major Life Activities Limitations	Health Satisfaction Status

Data Collection Tools

An interview schedule was designed for collecting primary data and translated into the national language (Urdu). It was pre-tested with a small group of 20 victims of RTI (Kothari, 2004), and inconsistencies and ambiguities were removed subsequently rectified before the actual data collection process. The researcher personally collected data from the male respondents. However, due to cultural constraints, it was not possible to approach female respondents for data collection. Therefore, a female investigator was hired and trained for collecting data from female respondents.

Operationalization of Variables

Major life activities limitations mean the extent to which an RTI victims' MLA (walking, performing manual tasks, talking, hearing, seeing, sleeping, and working) have reduced after traffic injury. Health satisfaction status means how satisfied the RTI victims were with their health after the traffic injury. Injury means how much the body organs are damaged in a traffic collision. These injuries range from minor to life-threatening. It includes cuts, scrapes, scratches, bruises, and punctured skin. Symptoms like slowness, weakness, and lack of muscle coordination related to speech function commonly come from dysarthria. The initial onset of dysarthria reduces speech intelligibility; it also limits the speaker's communicative ability. Furthermore, restrict social participation because dysarthria is a consistent indicator (Guo & Togher, 2008).

Measurement of Variables

Seven items review-based scale was developed to measure the major life activities limitation, where all items were negatively framed. Hence, positive responses on 4 or more items on the scale were considered RTI victims' limitations in major life activities. Short Assessment of Patient Satisfaction (SAPS) scale was used to measure the health satisfaction status of RTI victims (Hawthorne et al., 2014). The 7 items SAPS scale was contextualized according to the need of the study. All items were positively framed; therefore, positive responses on 4 or more items were considered high health satisfaction status while less than 4 were considered low health satisfaction.

Reliability analysis

For assuring internal consistency of the instrument scale, reliability analysis was performed through Cronbach's Alpha test. A scale with an Alpha is equal or greater than α=>0.6 was considered internally consistent and suitable for indexation practiced by other researchers (Mohamad et al., 2015). In this study, the reliability of Cronbach's Alpha value for the major life activity limitation scale was 0.63, and the health satisfaction status scale was 0.90.

Data Analysis

The collected data finalized in all respect were entered into SPSS v.20 and coded for its analysis. The data then analyzed using bivariate and multivariate statistical techniques.

Bivariate Analysis

At bivariate analysis, the independent variable's association with the dependent variable was performed by indexing the study variable separately. Subsequently, the independent variable was cross-tabulated with the dependent variable i.e., health satisfaction status.

$$\chi^2 = \sum \frac{(O_i - E_i)^2}{E_i}$$

x^2 = *chi-square*

O_i = *observed values*

E_i = *expected value*

Multivariate Analysis

The independent variable having Cronbach's α=0.63 was indexed, subsequently cross-tabulated with dependent variables to determine variations between the two variables. The multivariate analyses were performed by associating independent variables with the dependent variable while controlling educational status as background variable, resulting in spurious and non-spuriousness of relationship. The standard for spurious relationships was set in this study based on significance levels of the association between the variables. If at least one category of the controlled variable was found non-significant, then the relationship between independent and dependent variables was recorded as spurious. Similarly, if all categories carried significant value, then Tau-b values were taken into consideration. If all Tau-b values recorded variations, then the relationship was recorded as spurious, otherwise non-spurious.

RESULTS/FINDINGS

Bivariate Analysis

Table 3 shows the association between the independent and dependent variables. It was found that 75.2% of RTI victims had Difficulty in Standing/Walking (DISW), who was observed in low HSS compared to 39% who had no such dysfunctional status; however, they reported low HSS. It is further evident from the chi-square and Kendall Tau-b values where the association of DISW was found highly significant (P=0.000) and moderate negative (T^b = –0.358) with HSS. Similarly, 74.7% had difficulty in sitting who had low HSS compared to 43.3% who reported no difficulty in sitting. The association between difficulty in sitting with HSS was found highly significant (P=0.000) and negative (Tb = –0.319), suggesting that difficulty in sitting amongst the RTI victims plays a central role in influencing the HSS. The same status were inquired from respondents which illustrates that 85% had Memory Limitation (ML) who were found in low HSS

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compared to 55% who did not have ML. The association between ML and HSS was found highly significant (*P=0.000*) and negative (T^b = *-.246*) with HSS.

The result further reveals that 69% of respondents were found in low HSS who had dysarthria disorder after traffic injury compared to 60% who had no such problem. The association of dysarthria disorder with HSS was found non-significant (*p = 0.233*) and negative (T^b = *–0.057*), which means that dysarthria disorder did not influence the HSS. Similarly, the respondents who had Auditory Functional Limitations (AFL) were found 71% low HSS compared to 59.7% who had no AFL. The results further explore that association between AFL was non-significant (*p* = 0.1540) and negative (T^b = *–0.073*) with HSS. The respondents (61.9%) who had Visual Limitations (VL) were found in low HSS compared to those respondents (60.9%) who had no VL. The association between VL was non-significant (*P = 0.561*) and negative (T^b = *-.006*) with HSS, which shows that VL did not influence the HSS of RTI victims. The study's findings further explore that 68.3% of respondents had Disturbed Sleeping (DS) who were found in low HSS compared to 58.9% who had no DS. However, the association between DS was found non-significant (*P = 0.119*) and weak negative (*Tau-b = -.080*) with HSS, which means that DS has a negative association with HSS of RTI victims.

Table 3: Association between MLA limitation and health satisfaction status

Statement	Attitude	HSS of RTI victim			Chi–square value	Kendall Tau-b value
		High HSS	Low HSS	Total		
You feel difficulty in standing or walking for a short period of time	Yes	41 (24.8)	124 (75.2)	165 (100)	x^2 = 35.152	Tau-b = –0.358
	No	66 (60.6)	43 (39.4)	109 (100)	*p=0.000*	
You have problem in sitting	Yes	39 (25.3)	115 (74.7)	154 (100)	x^2 = 27.836	Tau-b = –0.319
	No	68 (56.7)	52 (43.3)	120 (100)	*p=0.000*	
You cannot learn things easily – mean your memory has been affected	Yes	8 (14.8)	46 (85.2)	54 (100)	x^2 = 16.598	Tau-b = –0.246
	No	99 (45)	121 (55)	220 (100)	*p=0.000*	
You cannot talk to someone easily and communicate your message to other person	Yes	9 (31)	20 (69)	29 (100)	x^2 = 0.876	Tau-b = –0.057
	No	98 (40)	147 (60)	245 (100)	*p = 0.233*	
You cannot listen the other person, mean your auditory sense has been affected	Yes	9 (29)	22 (71)	31 (100)	x^2 = 1.474	Tau-b = –0.073
	No	98 (40.3)	145 (59.7)	243 (100)	*p* = 0.1540	
You feel difficulty in watching things	Yes	8 (38.1)	13 (61.9)	21 (100)	x^2 = 0.009	Tau-b = –0.006
	No	99 (39.1)	154 (60.9)	253 (100)	*p = 0.561*	
Your sleep is disturbed after injury	Yes	19 (31.7)	41 (68.3)	60 (100)	x^2 = 1.760	Tau-b = –0.080
	No	88 (41.1)	126 (58.9)	214 (100)	*p = 0.119*	

MULTIVARIATE ANALYSIS

Table 4 illustrates the association of MLA limitation and HSS controlling education as a background variable. The results explained that the influence of MLA limitation on the HSS of illiterate respondents was non-significant (p=0.482); however, weak negative (T^b = –0.105). In contrast, such influence in the context of secondary education was found highly significant (p=0.000) and moderate negative (T^b = –0.287). Furthermore, the influence of the MLA in the context of higher education was non-significant (p=0.892). Simultaneously, a weak negative value of T^b = –.018 illustrates a less negative association between the independent and dependent variables. Based on the variation in chi-square values and Kendall's T^b values, the association between MLA limitation and HSS in the context of education was spurious. Hence, education explained variation in the association of independent and dependent variables.

DISCUSSION/ANALYSIS

The most frequent and common injuries in traffic crashes are head injuries that caused memory loss or learning abilities (Mayou et al., 2000; Másilková, 2017). Hence, major life activities' limitations are directly associated with low health satisfaction (De Jong et al., 2011). Most traffic injuries cause dysarthria (Kim et al., 2009), affecting speech function, slowness, weakness, and lack of muscle coordination.

Table 4: Association between MLA limitation and health satisfaction status controlling education

Education	**STATISTICS** (Chi–square-x^2 – P-value & Kendall's-T^b)	
Illiterate	x^2 =0.495 p=0.482 T^b = –0.105	
Secondary Education (Matric/Intermediate)	x^2 = 14.333 p=0.000 T^b = –0.287	x^2 = 12.940 p=0.000 T^b = –.217
Higher Education (Graduation above)	x^2 = 0.018 p=0.892 T^b = –0.018	

Dysarthria reduces speech intelligibility; also, it limits the communicative ability. These limiting functions further affect social participation (Guo & Togher, 2008). Our result found that dysarthria disorder did not influence the HSS. More precisely, the dysarthria problem could be less severe amongst the respondents of this study; otherwise, Hoffman et al. (2005) study revealed much more dissatisfaction from health because of dysarthria. The result further demonstrates that AFL and VL did not influence the HSS of RTI victims; however, Łabudzki & Tasiemski (2013) found more positive outcomes on blind and visually impaired individuals as the physical activity increases their subjective quality. Sleeping is one of the essential parts of MLA, which was excessively reported by most of the RTI victims (Philip et al., 2014). This study found that disturbed sleeping has a negative association with the HSS of RTI victims. It has been concluded from the above results that the majority of RTI victims were found chronic limitation in their MLA. Furthermore, the association between MLA and HSS was assessed while controlling education as a background variable. It was found that RTI victims with low education were more likely to report limitations in major life activities and health satisfaction status.

CONCLUSION

It has been concluded that the majority of RTI victims were found in chronic limitation performing their MLA. Furthermore, the association between MLA and HSS was assessed while controlling education as a background variable. It concluded that RTI victims with low education were more likely to report limitations in major life activities; subsequently, they were observed in low health satisfaction status.

LIMITATION AND STUDY FORWARD

This study was confined to the RTI victims who were confronted with traffic crashes and survived in it. Further research studies need to be carried out on the families left behind and their socioeconomic status, particularly women's psychological well-being.

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AUTHORS CONTRIBUTION

- The principal author (Waqas) has designed the central theme of the research work and carried all important steps and procedures.
- Dr. Intikhab Alam made the overall supervision of this research study.
- Dr. Mussawar Shah provided the technical and updated literature support time to time.
- Prof. Dr. Khalid Nawab was mentoring the whole research process.

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