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Research Article

**THE PUBLIC'S MISCONCEPTIONS ABOUT TRAUMATIC
BRAIN INJURY, SAUDI ARABIA, 2018**

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Abstract:

Background: Trauma is a leading cause of mortality and morbidity globally. In the developing countries, injuries are estimated to cause more than five million deaths per year. Traumatic brain injury TBI in particular is a major health and socioeconomic problem worldwide. It is account for one quarter to one-third of all accidental deaths, and for two thirds of traumatic deaths in hospitals.

AIM: This study was conducted to assess public awareness about traumatic brain injury in Saudi Arabia.

Methodology: A cross-sectional survey conducted during a period from august to October 2018. A total sample of 622 participants were included in the survey during the study period. Data were collected through electronic master sheet which was constructed by the researchers after intensive literature review and experts consultation.

Results: The average of participants' responses towards awareness regarding Traumatic Brain Injury was 2.87 out of 4 cross ponding to degree Maybe correct; with small value of St. D 0.424 which include that there is homogeneity of responses and non-dispersion from the mean. This result indicates a moderate level of awareness about Traumatic Brain Injury among sample study.

Conclusion: General population had moderate level of awareness regarding traumatic brain injury specially its direct effect on brain tissue and its physical consequences but awareness regarding psychological consequences is till defective.

Key words: Brain injury, Traumatic brain injury, Brain trauma, Population awareness, Knowledge.

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BACKGROUND:

Trauma is a leading cause of mortality and morbidity globally. In the developing countries, injuries are estimated to cause more than five million deaths per year. [1] Traumatic brain injury TBI in particular is a major health and socioeconomic problem worldwide. [2] It is account for one quarter to one-third of all accidental deaths, and for two thirds of traumatic deaths in hospitals.[3] In a large-scale study reviewing adult traumatic brain injuries conducted at a major trauma center in Riyadh, Saudi Arabia, RTA related injuries accounted for more than 85 % of adult brain injuries.[4] Another study at the same institute had indicated that falls were the most common causative agent in children under six years 45.6%, and MVC was the leading cause in high school students 74.4% [5] These findings are alarming and mandate more efforts towards public awareness concerning the TBI to ensure it is properly identified and managed. Although TBI may cause a host of observable deficits with motor, sensory, and speech functioning, the most debilitating impairments often result from the less conspicuous psychosocial, behavioral, and cognitive sequelae of the injury.[6] the mayo classification system has three main classifications including definite moderate-severe TBI, probable MTBI, and possible TBI.[7] Symptoms of TBI ranging according to the severity from mild headache to seizures and coma .

Misconceptions about traumatic brain injuries TBIs are rampant. Several researchers like have confirmed that misperceptions about TBI persist and are widely endorsed across Britain, Australia, the United States and Canada. [8, 9] So far.

In Saudi Arabia up to researchers' knowledge, no studies were conducted to assess general population's awareness and misconception regarding TBI which was the main motivation behind conducting this research paper. The main aim of this study was to enhance public awareness about traumatic brain injury in Saudi Arabia.

METHODOLOGY:

A cross-sectional survey conducted during a period from august to October 2018. A total sample of 622 participants were included in the survey during the study period. Data were collected through electronic master sheet which was constructed by the researchers after intensive literature review and experts consultation. The master sheet was designed by using Google form in Arabic language national language of KSA It was available among Saudi population through social media as Face book, Twitter and WhatsApp. The data collected were participants' demographic characteristics, Awareness regarding TBI using 4 point like scale ranging from 1 for wrong statement to 4 for correct statement. Also the tool covered source of information regarding TBI with family history of having similar cases. Awareness tool was validated for clarity and applicability by jure review and any modifications were considered.

DATA ANALYSIS:

After data were collected it was revised, coded and fed to statistical software IBM SPSS version 20. All statistical analysis was done using two tailed tests and alpha error of 0.05. P value less than or equal to 0.05 was considered to be statistically significant. Descriptive statistics was used as mean with standard deviation for scale variables and frequency with percentage for categorical variables. T-Test for independent samples which applied to test whether binary groups have different average values in Awareness of Traumatic Brain Injury. ANOVA test, which applied to test whether groups with more than two categories have different average values in in Awareness of Traumatic Brain Injury.

RESULTS:

The sample size that responded to the survey Awareness of Traumatic Brain Injury in Saudi Arabia 2018, were 622 respondents. From table (1).

Table (1): Sample Background Information

	Frequency	Percent
Gender		
Male	125	20.1%
Female	497	79.9%
Nationality		
Saudi	608	97.7%
Non-Saudi	14	2.3%

Age		
18-28	442	71.1%
29-39	107	17.1%
40-49	62	10%
50+	11	1.8%
Social status		
Single	399	64.1%
Married	216	34.7%
Divorced	7	1.2%
Education level		
Primary	5	0.8%
Intermediate	18	2.9%
Secondary	106	17%
University	470	75.6%
Postgraduate	23	3.7%
Career status		
Student	351	56.4%
Unemployed	149	24%
Employed	111	17.8%
Retired	11	1.8%
Work or study in health field		
Yes	173	27.8%
No	449	72.2%
Region		
Central region	119	19.2%
Eastern region	39	6.3%
Western region	111	17.8%
North region	17	2.7%
South region	336	54%
Have you ever had a traumatic brain injury?		
Yes	62	10%
No	560	90%
Do you have a background about brain injury?		
Yes	105	16.9%
No	517	83.1%
Total	622	100.0%

It's clear that the highest percentage of the total sample were female with 79.9% of the total sample, while 20.1% were male.

The highest percentage of the total sample 97.7% were Saudi, while 2.3% Non-Saudi. About age, the almost percentage of the total sample had 18 to 28 years old with 71.1% of the total sample. About

Social status, the almost percentage were single with 64.1% of the total sample.

As for Education level, the almost percentage had University degree with percentage 75.6% of the total sample. About Career status, the almost percentage were Student with percentage 56.4%, and only 27.8% of the total sample work or study in health field. The almost percentage 54% live in Southern region.

While 46% of the total sample live in the other region. The almost percentage of the total sample 90% hadn't a traumatic brain injury, while 10% had, and 16.9% of the total sample had a background about brain injury, while 83.1% hadn't.

Table (2) show that there is no question had mean score of Wong or Maybe Wong. Answers of participants towards the question: Head injury can damage the brain even if the person has not lost consciousness had the highest Mean score value 3.27 [

out of 4 which cross ponding to Correct according to table (2).

Also, the other answers of 16 questions had Mean score with degree maybe correct; since the mean value lie on interval 2.51 – 3.25. Overall, the average of participants' responses towards awareness regarding Traumatic Brain Injury was 2.87 out of 4 cross ponding to degree Maybe correct; with small value of St. Deviation 0.424 which include that there is homogeneity of responses and non-dispersion from the mean. This result indicates a moderate level of awareness about Traumatic Brain Injury among sample study.

Table (2): Descriptive of awareness items among the sampled population

Variables	Wrong (1)	Maybe wrong (2)	Maybe correct (3)	Correct (4)	Mean	St.D	Degree	Rank
1. Head injury can damage the brain even if the person has not lost consciousness.	7.6	5.8	38.9	47.7	3.27	.876	Correct	1
2 - Excessive neck flexion or flexion can cause damage to the brain even if there is no direct blow to the head.	14.0	15.1	25.4	45.5	3.02	1.080	Maybe correct	5
3. Emotional problems after head injury are usually not related to brain damage.	25.9	21.1	22.3	30.7	2.58	1.174	Maybe correct	15
4 - Most people with brain damage appear and act as disabled.	19.3	11.6	28.6	40.5	2.90	1.134	Maybe correct	8
5- When a person is unconscious, most wake up soon after without permanent effects.	22.5	8.5	32.0	37.0	2.83	1.153	Maybe correct	10
6- Even after several weeks of coma, when people wake up, most of them recognize and talk to others immediately.	26.5	13.3	21.5	38.6	2.72	1.227	Maybe correct	12
7 - When people are in a coma usually do not realize what is happening around them.	17.8	12.1	46.8	23.3	2.76	1.005	Maybe correct	11
8 - After the head injury, people can forget who they are, and do not recognize the other, but otherwise seem normal.	8.2	6.3	51.4	34.1	3.11	.848	Maybe correct	2
9- Sometimes the injured person can help the second head strike remember the things he forgot after the first blow.	18.2	9.6	32.6	39.5	2.94	1.103	Maybe correct	7
10- People with memory loss for pre-injury events usually have difficulty learning new things:	17.4	12.9	28.6	41.2	2.94	1.110	Maybe correct	7
11- After a head injury, learning new things is often more difficult than remembering events prior to injury.	23.8	17.0	23.5	35.7	2.71	1.182	Maybe correct	13
12- How quickly a person's recovery depends	11.9	7.7	44.4	36.0	3.05	.955	Maybe	3

mainly on how much he or she is doing his best to recover from injury.								correct	
13- People with head injuries are more likely to have another injury.	19.5	14.5	28.1	37.9	2.85	1.132	Maybe correct	9	
14- A person who has recovered from a head injury is less capable of carrying a second blow to the head.	11.3	9.0	44.5	35.2	3.04	.945	Maybe correct	4	
15- The healing of the injured person is completed when he / she feels "to return to normal".	13.5	8.7	42.6	35.2	3.00	.990	Maybe correct	6	
16 - Commitment to rest and stay inactive, good advice while healing the injured.	26.2	15.6	26.0	32.2	2.64	1.183	Maybe correct	14	
17- Full recovery from severe head injury is not possible, regardless of the person's desire to recover.	31.7	17.0	16.9	34.4	2.54	1.254	Maybe correct	16	
Mean & St. D					2.87	0.424	Maybe correct		

When participants asked about the information sources about brain injury Table (3), more than half of the sample 57.2% had no information sources about it, while 15.8% of the total sample take their

information from Social Media WhatsApp-Facebook-Twitter, followed by Educational institution school - university With 8.85, followed by Hospital medical staff with 5.15.

Table (3): Source of information regarding TBI among the sampled population

What are your information sources about brain injury?	N	%
Social Media (WhatsApp/ Facebook/ Twitter/ ..)	98	15.8
Educational institution (school - university.)	55	8.8
Hospital (medical staff)	32	5.1
Hospital (medical staff), Social Media (WhatsApp -Facebook-Twitter- ..)	23	3.7
Television	22	3.5
Television, Social Media (WhatsApp -Facebook-Twitter- .)	8	1.3
Social Media (WhatsApp -Facebook-Twitter- .), Educational institution (school - university ...)	7	1.1
Television, Social Media (WhatsApp -Facebook-Twitter- ..), Educational institution (school - university ..)	5	0.8
Other	4	0.6
Hospital (medical staff), Social Media (WhatsApp -Facebook-Twitter- ..), Educational institution (school - university ..)	3	0.5
Television, Hospital (medical staff)	2	0.3
Television, Hospital (medical staff), Educational institution (school - university ..)	2	0.3
Social Media (WhatsApp -Facebook-Twitter- ..), Educational institution	2	0.3

(school - university ..), Other		
Television, Hospital (medical staff), Social Media (WhatsApp -Facebook- Twitter- ..)	1	0.2
Television, Educational institution (school - university ..)	1	0.2
Social Media (WhatsApp -Facebook- Twitter- ..), other	1	0.2
Nothing	356	57.2
Total	622	100

Table (4) shows that there is a statistically significant difference between who work or study in a health field and awareness of traumatic brain injury; since p-value = 0.00; where participants who work or study in a health field had mean score of awareness 3.07 out of 4 more than who doesn't work or study in a health field. Also, the difference between who had background about brain injury and awareness of

traumatic brain injury; since p-value = 0.001; While there is no statistically significant difference in awareness of traumatic brain injury according to gender, nationality and who had a traumatic brain injury; since p-value>0.05 (not significant); due to the convergence of awareness averages between groups.

Table (4): Awareness regarding TBI by the population's demographic data

Awareness of traumatic brain injury	N	Mean	Std. D	T value	P value	
Gender	Male	125	2.8824	.46767	0.195	0.846
	Female	497	2.8741	.41334		
Nationality	Saudi	608	2.8780	.42246	0.877	0.381
	Non Saudi	14	2.7773	.51135		
Do you work or study in a health field?	Yes	173	3.0705	.37946	3.882	0.000**
	No	449	2.9163	.43417		
Have you ever had a traumatic brain injury?	Yes	62	2.8596	.35364	0.316	0.752
	No	560	2.8775	.43179		
Do you have a background about brain injury?	Yes	105	2.7625	.34270	3.535	0.001**

Table (5) and figure (1) shows that there is a statistically significant difference in Awareness of traumatic brain injury according to age in favor of

older participants who had the highest degree of awareness; since F= 12.702 with p-value (0.000 < 0.05).

Table (5): Awareness regarding TBI in relation to participants' age

Age	N	Mean	Std. D	F	Si g.	
Awareness of traumatic brain injury	18-28	44 2	2.8202	.39546	1 2. 7 0 2	0. 00 0* *
	29-39	10 7	2.9362	.44770		
	40-49	62	3.0977	.48131		
	50+	11	3.2674	.32043		
	Total	62 2	2.8757	.42443		

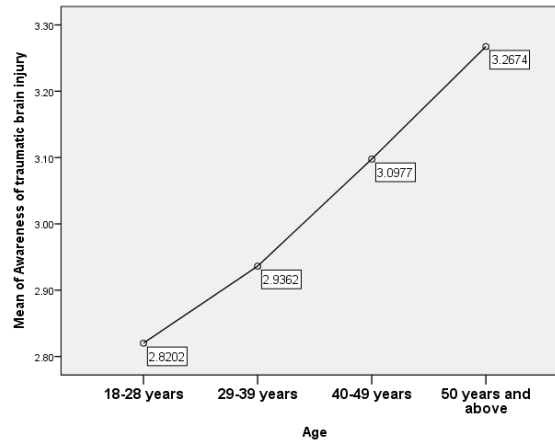
Figure (1): Awareness regarding TBI in relation to participants' age

Table (6) and figure (2) shows that there is a statistically significant difference in Awareness of traumatic brain injury according to Social status in favor of married participants who had the highest degree of awareness (2.9850) out of (4); since $F= 11.415$ with $p\text{-value} (0.000 < 0.05)$.

Table (6): Awareness regarding TBI in relation to participants' social status

Social status	N	Mean	Std. D	F	Si g.	
Awareness of traumatic brain injury	Single	39 9	2.8187	.38621	1 1. 4 1 5	0. 00 0* *
	Married	21 6	2.9850	.45411		
	Divorced	7	2.7563	.83565		
	Total	62 2	2.8757	.42443		

Figure (2): Awareness regarding TBI in relation to participants' social status

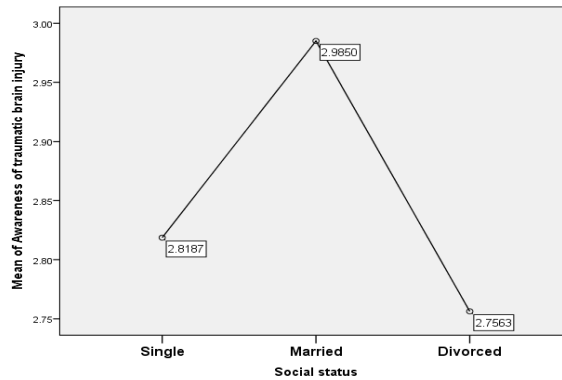


Table (7) and figure (3) shows that there is a statistically significant difference in Awareness of traumatic brain injury according to education in favor of University participants who had the highest degree of awareness (2.0817) out of (4); since $F = 2.783$ with $p\text{-value} (0.026 < 0.05)$.

Table (7): Awareness regarding TBI in relation to participants' educational level

Education Level	N	Mean	Std. D	F	Si g.	
Awareness of traumatic brain injury	Primary	5	2.8473	.53267	2.783	0.026*
	Intermediate	18	2.8900	.42664		
	Secondary	106	2.9550	.41607		
	University	470	3.0817	.42007		
	Postgraduate	23	3.0588	.46328		
	Total	622	2.8757	.42443		

Figure (3): Awareness regarding TBI in relation to participants' educational level

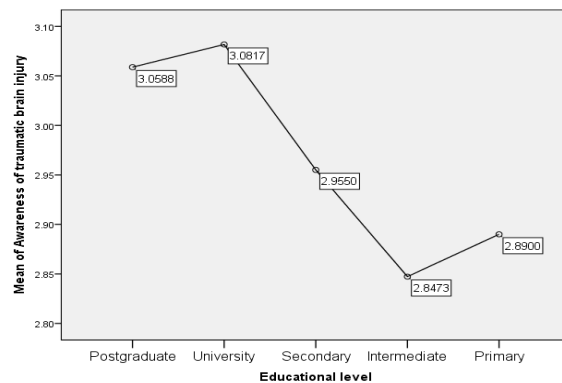


Table (8) and figure (4) shows that there is a statistically significant difference in Awareness of traumatic brain injury according to Career status in favor of Retired participants who had the highest degree of awareness (3.1979) out of (4); since $F= 8.359$ with $p\text{-value} (0.000 < 0.05)$.

Table (8): Awareness regarding TBI in relation to participants' career status

Career status		N	Mean	Std. D	F	Si g.
Awareness of traumatic brain injury	Student	351	2.8078	.39200	8.359	0.000*
	Unemployed	149	2.9601	.44878		
	Employee	111	2.9454	.45021		
	Retired	11	3.1979	.40265		
	Total	622	2.8757	.42443		

Figure (4): Awareness regarding TBI in relation to participants' career status

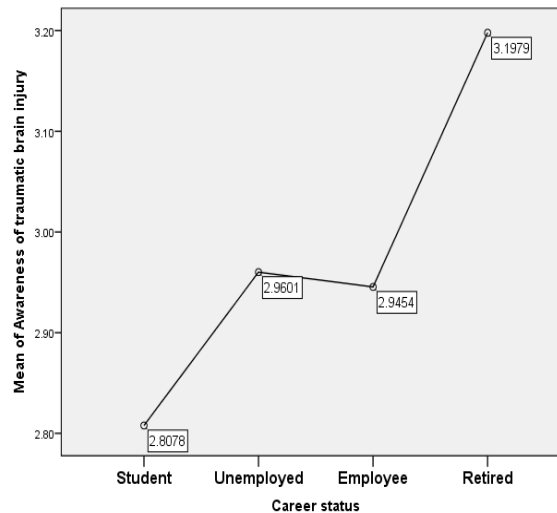
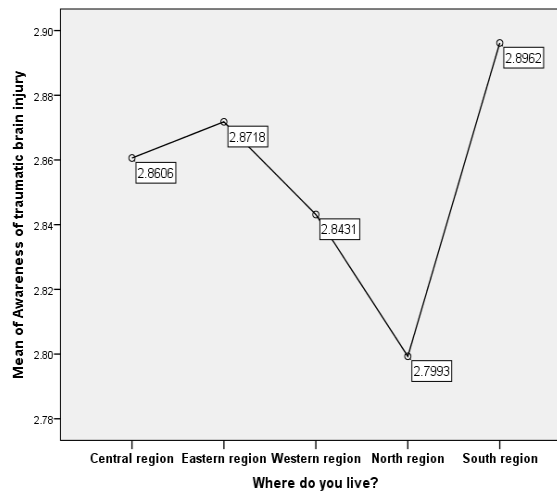


Table (9) shows that there is no statistically significant difference in Awareness of traumatic brain injury according to Region; since $F= 0.534$ with $p\text{-value} (0.711 > 0.05)$. This results due to the convergence of the degree of awareness according to region, as shown clearly in the below Figure 5.

Table (9): Awareness regarding TBI in relation to participants' residence region

Region		N	Mean	Std. D	F	Si g.
Awareness of traumatic brain injury	Central	119	2.8606	.45986	0.534	0.711
	Eastern	39	2.8718	.46998		
	Western	111	2.8431	.47896		
	North	17	2.7993	.22211		
	South	336	2.8962	.39441		
	Total	622	2.8757	.42443		

Figure (5): Awareness regarding TBI in relation to participants' residence region**DISCUSSION:**

Results of this study showed that the average of participants' responses towards awareness regarding Traumatic Brain Injury was ponding to degree "May be correct", which include that there is homogeneity of responses and non-dispersion from the mean. This result indicates a moderate level of awareness about Traumatic Brain Injury among sample study.

A study carried out in KSA in 2014 showed that motor vehicle accidents (63.4%) and falls (32.4%) are the leading causes of traumatic brain injuries in the region. Males were the main victims of all types of injuries. This is due to the fact that females in general including female children stay indoors most of time. In this study, direct head trauma constituted 4.2% of the series. Cases here were mainly due to falling objects (e.g., T.V. sets) and gunshots. The researchers did not encounter cases due to violence, which in Asian series accounts for 10% of cases of traumatic brain injuries. In neighboring country, Yemen domestic events were the leading cause of traumatic brain injuries [10].

Another study in Saudi Arabia also showed that the increased rate among males compared to females (10.4 to 1, respectively) is higher than other studies in the developed world and neighboring countries. It could be a reflection that women do not drive cars in Saudi Arabia [11].

It also showed that Pedestrian injuries were the second common cause (17%) of THI. The alarming figure of mortality within this group (40%) is different from those reported in the developed world. For instance, in Europe and the US pedestrian mortality among THI patients reached 20% and 14% respectively. Although developed countries reported less pedestrian injuries, 5000 people die and 60 000 are injured as pedestrians in the US annually.

Comparative fissures from the European Union indicate that out of 50 000 annual road traffic deaths, 8500 were pedestrians [12].

In 2017, a study aimed to describe trends in time to rehabilitation admission and rehabilitation length of stay, compare functional independence at discharge from rehabilitation between patients who arrived directly from acute care versus those from elsewhere and identify independent predictors of functional outcomes following rehabilitation, showed that males were more likely to sustain a TBI with the highest frequency among those between 20 and 30 years of age. While this reflects a common sex difference [13].

In recent decades, an increase in TBI in older adults has been observed in higher-income countries, resulting in part from an increased life expectancy and greater mobility of older adults [14]. We noted no increased incidence of TBI among older adults in our study. This may be a result of the notably younger population of Saudi Arabia where the median age is 27, whereas the median age in the USA is 38 years and is above 40 for most European countries [15].

CONCLUSION AND RECOMMENDATIONS:

In conclusion, based on the articles studied in this review, sampled population had moderate level of awareness regarding traumatic brain injury specially its direct effect on brain tissue and its physical consequences but awareness regarding psychological consequences is till defective. Age, education and medical filed work were the most important determinants of populations' awareness level. More intention should be paid to improve populations' awareness regarding TBI and its consequences and how to deal with. This can be done through mass

media, health education campaigns, health education by medical staff in primary health care centers or even hospitals.

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