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IMPACT OF HEPATITIS ON AGRICULTURE PRODUCTIVITY AND AWARENESS ABOUT DISEASE IN RURAL AREAS

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Hepatitis is a fatal disease. This disease caused serious problem in developing countries as well as in Pakistan. A large number of population is affected by this disease in Pakistan. This study reports socio economic determinants of hepatitis B and C knowledge in urban and rural areas. Impact of hepatitis disease on agriculture production is also calculated in this study. Data of 350 respondents was collected from urban and rural areas. 150 farmers were also interviewed to calculate the impact of disease on agriculture production. Tobit model was used to calculate the determinants of knowledge about disease. Multiple regression model was used to calculate the impact of disease on production. The results showed that rural people has less knowledge about diseases compared to urban people. Income, education and locality had positive impact on knowledge. It is also revealed that patients have significantly low agriculture production than non-patients. Government should launch awareness campaign to increase knowledge about disease especially in rural areas so that disease and production losses due to disease can be controlled.
Keywords: Agriculture production, Hepatitis, rural areas, tobit model.

INTRODUCTION

A much more systematic relationship between health and economic growth became the attention of economists (Barro and Sala-i-Martin, 2004) where correlation between health and wealth was highlighted. Economic growth models have been extended to recognize the importance of health, and to include it as a human capital input. Most of the lesser developed countries are essentially poor because a majority of their population is unhealthy (Sala-i-Martin 2005). The most important problems of less developed countries like Pakistan are hepatitis B and C (Bosan, 2010). Over 20 million people become annually infected with this virus worldwide and among those, 350 million people are chronic carriers (WHO, 2012). Universally, 2.2% of the total population is infected with hepatitis C infection (Alter *et al.,* 2007). Hepatitis C is turning into a big health issue of mostly developing counties while Pakistan has the second most prevalence rate (8%) of hepatitis C (Khattak *et al.,* 2013; WHO, 2012). Hepatitis B infection (HBV) and hepatitis C infection (HCV) diseases are general wellbeing threats to most developing nations where medical services frameworks do not have the security measures necessary to decrease the chances of contamination (Qureshi *et al.,* 2010). Even there is no vaccination to prevent Hepatitis C (Ashfaq *et al.,* 2011). So, awareness and knowledge augmentation about this disease is only one way to avoid this disease. Various studies show that people have no knowledge and awareness about hepatitis B and C disease in world as well as in Pakistan (Crutzen and Goritz, 2012; Du *et al*., 2012; Khuwaja *et al.,* 2002; Talpur *et al.,* 2007). The rate of HCV patients is more in rural areas than urban regions of Pakistan (Aziz *et al.,* 2011). This is very alarming situation because 66% percent population live in rural areas in Pakistan (Shaikh *et al.,* 2005) where agriculture contributes 19.8 percent in GDP and remains the largest employer absorbing 42.3 percent of the country's total labor force. The agriculture sector witnessed a negative growth of -0.19 last year and the growth of crops declined by 6.25 percent (Ministry of Finance, 2016). Hence, we tried to find either this disease is cause of loss in agriculture production or not and what are socio economic determinants of hepatitis B and C knowledge.

MATERIALS AND METHODS

The primary data was collected from three tehsils of Faisalabad district for this study. Based on the available literature (Israel, 1992), total 350 respondents were selected for collecting data about hepatitis B and C knowledge from rural and urban areas. 150 farmers were also interviewed to study the impact of hepatitis B and C disease on agriculture production. Purposive sampling (non-probability sample) technique was adopted to collect information for the study from each cluster.

Knowledge about this disease was comprised of many dimensions like cause, source, mode of transmission for

spread of this disease, destructive effects of disease, preventive measures, and available medication for disease and diagnostics of disease etc. This study accounted for all such dimensions in total of 27 questions from respondents. The most important 10 out of all such questions were aggregated to represent knowledge of the respondent about disease. The range of the knowledge score was from 0 to 1 for individual respondents. Where zero represented completely ignorant about this disease and one as d perfect basic knowledge of respondent about hepatitis like other studies (Shah *et al.,* 2015; Souza *et al.,* 2016). Cross sectional data was collected from patients and non-patients on knowledge about hepatitis, socioeconomic variables like age, gender, locality, education level, household income, household size, information on diagnostic tests or not, lived with any known patient of such disease etc. Then Tobit model was applied to determine social and economic factors associated with knowledge of hepatitis B and C like other studies (Ahmed and Ahmed, 2007; Yaseen *et al.,* 2014). In this study following model was run.

$Know = C + a_1\ age + a_2\ education + a_3\ no.\ of\ family\ member + a_4\ income + a_5\ live\ with\ HP\ patient + a_6\ locality + a_7\ screening\ test.$

Know = knowledge about hepatitis.

C = constant of the model

Age = age of respondents measured in years.

Education = education measured in number of years.

No. of family member = the family size of respondents.

Income = total monthly income of respondent plus income of other earning family member in house plus income from other resources (rent, gift or remittent)

Live with HP patient = either respondent ever lived with hepatitis patient or not.

Locality = Locality is recorded in 'rural' and 'urban' categories.

Screening test = whether the respondent has gone through any screening test for hepatitis.

$a_1$to a_7 are the coefficients of these independent variables. Cross sectional data is collected from 150 farmers to measure impact of hepatitis disease on agricultural production. Information was collected from farmers having hepatitis about their farm production of wheat before disease and after disease. From non-patient farmers, data was collected only about current production of wheat crop. In this model, current production per acre in Kilograms of patient (after disease) and non-patient was taken as a dependent variable. Multiple linear regression was run to estimate the factor affecting agriculture production. The model is given below:

$Agri.\ production = C + a_1\ age + a_2\ education + a_3\ patient + a_4\ income + a_5\ no\ of\ family\ members$

Agri. Production = agricultural production per acre.

Patient = if farmer is patient then value is 1 otherwise 0.

While age, education, income and number of family members are taken in same manner as in previous model.

RESULTS AND DISCUSSION

In a developing country like Pakistan, people have no knowledge about causes of hepatitis (B and C) due to high illiteracy rate (Balfour, 2009). Table 1 explains that majority of the respondents had no knowledge about hepatitis disease. 50 percent of the total population had no knowledge as they got zero score. Only 22% percent people have hepatitis knowledge score up to 0.5. Only 7% percent respondents had complete knowledge about hepatitis disease. This lack of knowledge could be the main reason of rapid increase in hepatitis disease in Pakistan as stated by Balfour (2009) and Ali *et al.* (2015).

Table 1. Frequency of knowledge score of control group and patients.

Knowledge Score	Percent	Cumulative Percent
0.00	50.3	50.3
0.20	0.6	50.9
0.30	3.7	54.6
0.40	10.0	64.6
0.50	8.3	72.9
0.60	7.1	80.0
0.70	5.4	85.4
0.80	3.7	89.1
0.90	3.7	92.9
1.00	7.1	100.0
Total	100.0	

The results of Table 2 show that female respondents had more knowledge than the male respondents. The study further revealed that young people had more knowledge than old people about hepatitis. People having age less than 34 years had the highest knowledge about hepatitis disease. While hepatitis knowledge score was very low (0.26) among old age group of the respondents. These results are similar to the findings of Mohamed *et al.* (2012).

Table 2. Knowledge score compared with gender, age and education.

Knowledge and attitude		Knowledge score (mean)
Gender of respondent	Female	0.34
	Male	0.29
Categories with respect to age	Less than 34 years	0.38
	34-45 years	0.32
	Above 45 years	0.26
Categories with respect to education	Primary	0.05
	Middle	0.21
	Matriculation	0.26
	Intermediate	0.42
	Above	0.65

The educated people had high knowledge about hepatitis disease as reported by Haq *et al.* (2012) and Adoba *et al.* (2015). People with primary or less than primary education have no knowledge about hepatitis while Respondents with the highest education got high knowledge score.

In Table 3, the results show that low income people had low knowledge while high income people had high knowledge as stated by Haq *et al.* (2012). Table 3 also reveals that urban people had more disease knowledge as compared to rural people.

Table 3. Knowledge score compared with income and locality.

Knowledge and attitude		Knowledge score (mean)
Categorical income	Low income group (<Rs. 23000)	0.11
	Medium income group (Rs. 23001 to Rs. 50000)	0.28
	High income group (>Rs. 50000)	0.56
Locality (urban/rural)	Rural	0.19
	Urban	0.46

Table 4 shows that age of the respondent was found to be negatively related with knowledge of that respondents. The coefficient value was -0.004829 and p-value of z-test showed that it was significant at less than 1 percent level of significance. So, older people tend to have less knowledge about this disease is also reported by Vermunt *et al.* (2015) and Brouard *et al.* (2013). Education was positively associated with knowledge of the respondents, and p-value of the z-test depicted that its coefficient is statistically significant at less than 1 percent level of significance. Education has a positive role to play in the knowledge about this disease. Therefore, uneducated people are more vulnerable to this disease due to poor knowledge. Family size was recorded in headcounts. It showed positive effect on knowledge index. Total family income was found to be positively related with knowledge about this disease. Despite the fact that its coefficient was very low, yet it had positive effect on knowledge of the individuals about this disease. Therefore, poor people will be more vulnerable to this disease due to poor knowledge. These findings are similar to the results of Brouard *et al.* (2013) and Haq *et al.*-, (2012). The people who have ever lived with Hepatitis patients possess more knowledge about this disease due to their exposure during their experience with them. Locality as 'rural' and 'urban' was also analyzed. Where '1' represents that the respondent belongs to urban areas and '0' as rural areas. The results showed that locality significantly contributed to knowledge about Hepatitis. Rural residents had low level of knowledge as compared to urban residents (Shah *et al.,* 2015). The coefficient for screening test was positive and statistically significant, which means that people who have gone through screening test for Hepatitis disease are more aware about it.

Table 4. Determinants of knowledge regarding hepatitis.

Variables	Coefficients	Std. Error	z-Statistics
C	-0.325761	0.11077	-2.941*
Age	-0.004829	0.00205	-2.356*
Education	0.045089	0.00406	11.120*
No. of family member	0.001865	0.00833	0.224
Income	8.72E-07	6.10E-7	1.429
Live with HP patient	0.078589	0.07127	1.103
Locality	0.160701	0.04111	3.909*
Screening test	0.475312	0.04116	11.548*

*significant at less than 1 percent level of significance.

Table 5 revealed that hepatitis patients had low production than non-patient and this was statistically significant at less than one percent level of significance. The data also depicted that age, total income and education were positively related with the agriculture production. Income and education are statistically significant. Number of family members were negatively correlated to the agricultural production.

Table 5. Impact of disease on agri. Production.

Agri. Production	B	Std. Error	T	Sig.
C	33.38500	4.508	7.405	0.000
Patient	-14.68000	1.695	-8.663	0.000
Age	0.02000	0.071	0.287	0.774
Total Income	0.00009	0.000	3.124	0.002
Education	0.43400	0.162	2.675	0.008
No. of Family members	-0.30500	0.347	-0.881	0.380

T-paired test was also applied to check impact of disease on agricultural production. We took data from farmers of theirs farms production per acre of wheat crop before and after disease and tested that either disease had negative impact on production or not. The result shows that there is significant difference between the production before and after the disease. After disease farm production is significantly decreased.

Table 6. Paired test before and after disease production.

Paired Test	Mean	Std. Deviation	Std. Error	T	Sig.
Production before – production after	15.69	6.93	0.67	23.42	0.000

***Conclusion*:** In a developing country like Pakistan, 50% of people especially females, low income people and rural people have no knowledge about causes of hepatitis due to high illiteracy rate which may be main reason of rapid increase in hepatitis disease. The age, total income and education were found to be positively correlated with the agriculture production. Number of family members were negatively correlated to the agricultural production. It was found that there is significant difference between the production before and production after the disease. Government should launch campaign for increasing awareness about hepatitis B and C especially in rural areas so this disease can be controlled and as a result loss of agriculture productivity can be avoided.

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