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Article:	**Psychosocial Determinants of Life Satisfaction in Patients with Hepatitis B and Hepatitis C**
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ABSTRACT

Present study was to assess the role of grit, metacognitive awareness and depression in life satisfaction of patients with Hepatitis B & C. It was hypothesized that these constructs would be significantly associated with one another, specifically, that depression would negatively predict life satisfaction while grit and metacognitive awareness would have positive associations with life satisfaction. The study used a correlational research design. The sample size of the study was 200 including (*N=120 males*, *N= 80 females*) diagnosed with hepatitis b and C which selected from various healthcare settings of Lahore. Purposive sampling technique was used for sample selection. Beck Depression Inventory, Short Grit Scale, Satisfaction with Life Scale and Metacognitive Awareness Inventory were used for data collection. The results showed that grit and metacognitive awareness is positively associated with life satisfaction while depression has a significant negative association. Depression and Metacognitive Awareness significantly predicted and mediating influence on the association between grit and life satisfaction.

Keywords: *Grit, Depression, Metacognitive Awareness, Life Satisfaction, Hepatitis B & C*

INTRODUCTION

Globally, viral hepatitis became a major cause of death, increasing a huge burden of disease among Asian countries including Pakistan (Sandhu et al., 2020) either it is blood borne or water/food swallowed hepatotoxic virus. According to a report, it has been estimated that 350 million people globally are suffered in chronic hepatitis B virus (HBV) (Abesin et al., 2020). According to the World Health Organization (2020), more than 354 million individuals are living with Hep B infection. Moreover, the viral disease has resulted in 1.3 million deaths (i.e. primary liver cancer) (WHO, 2020). Furthermore, the global prevalence rates of Hep B are around 7 to 9 million (2.5 %) and Hep C are approximately 4.8 % (Mehmood et al., 2020), which led researchers to speculate a higher prevalence of 6 to 7 % due to the limited testing and coverage (Lenzo et al., 2020).

Different studies have highlighted that the chronic Hep B and Hep C infections are associated with progressive complications such as, cirrhosis of the liver, hepatocellular carcinoma along with liver failure (Hughes et al., 2016; Vu et al., 2019). Furthermore, different psychological problems are also associated with Hep B and C including depression and stress (Weinstein et al., 2011; Khoo et al., 2021). The results of a recent study indicated that the scores are higher among the participants suffering in Hep B and C with low scores on quality of life (Li et al., 2020).

It has been indicated that the impact of positive mental health on life satisfaction and quality of life in patients with different chronic conditions including Hep B, Hep C, HIV/AIDs has been extensively established (Voinov et al., 2013; Wang et al., 2016; Sayeed et al., 2020), but the limited evidence is available with regard to the predictive role of different psychological variables (grit and metacognitive awareness) that might serve as protective factors against depression.

The burden of Hep B and Hep C is continuing to rise in Pakistan, and there is a limited attention is being paid towards addressing psychological challenges associated with these conditions (Kumar et al., 2020; Mirabdolhagh Hazaveh et al., 2012; Silberbogen et al., 2009). WHO is working to raise awareness, formulate evidence-based policy for prevention and for the provision of mental health support to achieve the Sustainable Development Agenda 2030 (WHO, 2021).

Rationale of the Study

Past research evidence has shown that Hep B and Hep C lead can lead to adverse psychological consequences. However, there are certain psychological constructs that may provide a protective influence with regard to the mental health of patients of Hep B and Hep C. Therefore, a core objective of the present study was to assess the predictive association among grit, metacognitive awareness and depression with life satisfaction in patients diagnosed with Hep B and Hep C. Moreover, keeping in view the limited mental health counseling and support provided to these patients in Pakistan, the present study highlights how promoting grit

and metacognitive awareness can lead to beneficial influences on the life satisfaction of patients.

Hypotheses

- There would be a significant association among grit, metacognitive awareness, depression and life satisfaction in individuals with Hep B/Hep C
- Grit, depression and metacognitive awareness would predict life satisfaction in patients with Hep B/Hep C
- Depression and Metacognitive would mediate the association between Grit and Life Satisfaction with Hep B/Hep C

Methodology

Research design

Correlational research design was used for assessing the relationship among the variables of the study and to assess their relevance to Hepatitis B and Hepatitis C.

Sampling strategy/ technique

This research used purposive sampling strategy/technique. Sample was collected from different hospitals and clinics of Lahore including Mayo Hospital, Sheikh Zayed Hospital and Ganga Ram Hospital, Lahore.

Participants

The sample was consisted of 200 hepatitis B-C patients, male and females. The sample size for the study was 200 which included 120 males and 80 females selected. The age range of the participants was from 19 to 89 years.

Inclusion criteria

- Those patients who diagnosed with chronic Hep B and Hep C were selected for the study.
- Patients with and without cirrhosis were also included in the study as it is a major physiological consequence of being chronically effected with Hepatitis B and Hepatitis C.
- Above 20 years' participants were included in the study.

Instruments

1. Beck's Depression Inventory (BDI)

Beck depression inventory was used for measurement of depression scores. The reliability of the scale is 0.86 (Beck et al., 1987). One of the most widely used psychometric tests for measuring the severity of depression. There is also evidence to show that the scale has

been used for assessing depression levels in patients with different chronic conditions (Georgi et al., 2019; Kuhner et al., 2007; Wang & Gorstein, 2013).

2. Short Grit Scale

Short Gril Scale was used for assessing scores on grit. It is used for measurement of trait level perseverance along with passion and commitment towards long term goals (Duckworth et al., 2007). Research evidence has also shown that its usage in healthcare settings has grown in recent years (Date et al., 2016; Traino et al., 2019).

3. The Satisfaction with Life Scale (SWLS)

Life Satisfaction scale was used for assessing global cognitive measures and for making judgements regarding life satisfaction of individuals (Diener et al., 1985). In relevance to response options, participants are required to identify their level of agreement and disagreement across a 7 point likert scale (Corrigan et al., 2013). The range of the scores from 5-35 and the evidence suggests that a score of 20 representing a central measuring point (Lopez-Ortega et al., 2016; Maroufizadeh et al., 2016).

4. Metacognitive Awareness Inventory (MAI)

Metacognitive awareness, which refers to the process of thinking about one's thinking was measured through the MAI inventory (Schraw & Dennison, 1994). The items of the scale are divided into two major subscales each of which is dedicated towards measurement of specific domains of metacognition including knowledge and regulation of cognition (Heidari & Bahrami, 2012; Song et al., 2021). There is also evidence to show regarding the utility of the scale across healthcare settings (Gholami et al., 2016; Teasdale et al., 2002).

Procedure/ Data collection

After attaining approval of the topic from the Departmental Board of Studies of University of Lahore, Pakistan in addition to permissions from the authors, data collection was initiated from across different hospitals. Data was collected from Mayo Hospital, Sheikh Zayed Hospital and Ganga Ram Hospital, Lahore. The rationale behind selection of this healthcare sites was due to the high patient inflows in these hospitals. The participants selected were informed about the nature of research after their consent they were included in the research.

Data analysis

Correlations, Stepwise regression and mediation analyses were used.

Ethical considerations

Informed consent, confidentiality and anonymity of participants was ensured. The researchers also provided counseling to the patients concerned following completion of data collection. Institutional permission was also sought from the hospitals concerned.

RESULTS

Table 1

Demographic Analysis

Descriptive Statistics of Demographic Variables of the Sample (N =200)

Variables	*F*	*%*
Age		
19-40	88	44.0
41-60	74	37.0
61-85	38	19.0
Gender		
Male	120	60.0
Female	80	40.0
Socio-economic Status		
Low	14	7.0
Middle	184	92.0
High	2	1.0
Family system		
Joint	138	69.0
Nuclear	62	31.0
Marital status		
Married	170	85.0
Single	30	15.0
Education		
Below Matric	24	12.0
Matric	40	20.0
Inter	58	29.0
Graduation	48	24.0
Masters	28	14.0
Mphil	2	1.0

Table 2

Reliability Analysis

Table shows the Psychometric properties of Variables

Variables	*M*	*SD*	*α*	No of items
Grit	22.4	58.7	.68	8
Meta-Cognition	64.9	110.3	.82	52
Depression	20.6	76.1	.84	21
Life Satisfaction	18.3	63.7	.80	5

Note: *α= Reliability coefficient*

In terms of reliability analysis, depression had the highest reliability of .84 followed by meta-cognition awareness with a reliability of .82, life satisfaction with a reliability of .80 and grit with .68 reliability. All scales were marked for having a high reliability except grit-s scale.

Table 3

Inter-Correlation among Grit, Meta Cognition Awareness, Depression and Life Satisfaction

Variable	I	II	III	IV
I-Grit	–	.21*	-.31**	.32**
II- Meta Cog Awareness		–	-.40**	.18
III- Depression			–	-.46**
IV-Life Satisfaction				–

Note: ***p<.01,*p<.05*

Pearson product moment correlation was performed to access the association among Grit, Meta Cognition Awareness, Depression and Life satisfaction. The findings showed that there is a significant positive relationship between grit and meta-cognition awareness (r= -.21, p<.05). There is a negative association between grit and depression (r= -.31, p<.01). A significant negative relationship in terms of grit and life satisfaction was observed (r= -.32, p<.01). A significant and negative association between meta-cognition awareness and depression (r= -.40, p<.01). Also, depression and life satisfaction have been identified as having a significant and negative association (r= -.46, p<.01)

Table 4

Regression of Association to Assess Predictors of Life satisfaction

	Model 1			*Model 2*			*Model 3*			*CI*	
Predictors	*B*	*SE*	*B*	*B*	*SE*	*β*	*B*	*SE*	*B*	*LL*	*UL*
Constant	22.2	1.6		29.1	1.5		18.0	3.0		[26.09, 32.47]	
Depression	-.41	.08	-.46	-.52	.08	-.58	-.50	.08	-.56	[-.57,-.25]	
LFT				.19	.06	.28	.53	.10	.77	[26.111,32.26]	
Meta-Cog							.14	.03	.60	[11.97,24.02]	
R			.46			.52			.62		
F			26.5			18.5			20.3		
R^2			.21			.27			.38		

Step 1: F (1, 99) = 26.5, p< .001. Step 2: F (2, 99) = 18.5, p< .001. Step 3: F (3, 99) =20.3, p< .001, *CI*=Confidence Interval

Stepwise regression analysis was used for prediction of quality of life. It was found depression (*B=-.41, p <.001*) was found as having a significant predictive affect on life satisfaction. At the same time, LFT significantly predicted life satisfaction (*B=1.9, p <.001*). Meta-cognitive Awareness had a significant predicted impact on life satisfaction(*B=.14, p <.001*). R^2 of the model was .38 which is an indication that the independent variable accounted for 38 % of the variance in the dependent variable. However, PCR, gender, SES, Cities, blood group, marital status, and education have no contribution in the prediction of life satisfaction.

Table 5

	Male (n=120)		Female (n=80)				95 % CI		
Variable	*M*	*SD*	*M*	*SD*	*t*(97)	*p*	*LL*	*UL*	Cohen's *d*
Grit	22.0	7.54	23.0	7.91	-.63	.52	-4.0	2.0	0.12
Meta-cog	49.6	29.1	46.9	30.3	.45	.64	-9.1	14.6	0.10
Depression	19.1	7.91	17.4	8.14	1.0	.29	-1.5	4.9	0.21
Life Satisfaction	21.2	7.46	22.3	6.83	-.78	.43	-4.0	1.7	0.15

Mean Differences on Psychological Distress, Self-Esteem, Social Support and Quality of Life (N=200)

Note. *CI*=confidence interval, *LL*=lower limit, *UL*=upper limit.

The results in table 5 have shown no significant mean differences between males and females on grit, meta-cognitive awareness, depression and life satisfaction.

Table 6

Mediating Influence of Meta-cognition on the Relationship b/w Grit and Life Satisfaction

Measures	*B*	*SE*	*P*
Step-1			
(Path c)			
Outcome: LS			
Grit	.28	.09	.002
Step 2 (Path a)			
Outcome: MC			
Grit	.84	.38	.002
Step 3 (Path b)			
Outcome: LS			
Meta Cog	.02	.02	.001
(Path c')			
Mediator: Meta Cog			
Predictor: Grit	.12	.38	.003

Note: *LS= life satisfaction, MC= meta-cognition awareness,*p*<.05, ***p*<.01

Preacher and Hayes (2008) approach to conducting mediation analysis via bootstrapping was used for the present study. As per the findings of the study, Path c in the

table shows the predictive association between grit as the independent variable and life satisfaction as the outcome variable. There was a significant predictive relationship between the two variables (*B*= .28, *p*<.05). Path a shows how grit significantly predicted scores on metacognitive awareness cale i.e. (*B*= .84, *p*<.001). Path b in the table shows how metacognitive awareness significantly predicted life satisfaction (*B*=.02, *p*<.001). The path c' (c prime path) shows the partial mediating effect of metacognitive awareness (*B*= .12, *p*<.001).

Table 7

Mediating Influence of Depression on the Association b/w Grit and Life Satisfaction

Measures	*B*	*SE*	*P*
Step 1			
(Path c)			
Outcome: LS			
Grit	.34	.09	.002
Step 2			
(Path a)			
Outcome: depression			
Grit	-.46	.38	.002
Step 3 (Path b)			
Outcome: LS			
Depression	-.12	.02	.001
(Path c')			
Mediator: Depression			
Predictor: Grit	-.01	.38	.07

Note: *LS= life satisfaction, p*<.05, **p<.01

The aforementioned analysis shows through the Path C that a a significant predictive relationship between the two variables (*B*= .34, *p*<.05).

This path a has shown that grit significantly predicted depression (*B*= -.46, *p*<.001).

Path b shows a significant and predictive influence of depression on life satisfaction (*B*=-.12, *p*<.001).

The path c' (c prime path) shows that with introduction of the mediating variable i.e. variable, path c which was earlier significant became insignificant which is evident of complete mediation (*B*=-.01, *p*<.001).

DISCUSSION

The present research assessed the role of grit, metacognitive awareness and depression and how these constructs influence life satisfaction in patients diagnosed with Hepatitis B and Hepatitis C. The findings of the study have provided numerous insights about the constructs being assessed and their relevance and significance for patients with Hepatitis B and Hepatitis C.

The results had shown that grit had positive associations with metacognitive awareness and life satisfaction and a negative association with depression. In relevance to the past literature, grit has been identified as a major and protective psychological strength that contributes towards the wellbeing and life satisfaction of patients diagnosed with potentially fatal diseases such as Hepatitis B and Hepatitis C. Moreover, studies have shown that patients who are chronically affected with AIDs, Hepatitis B and Hepatitis C experience higher levels of depression (White et al., 2016).

The literature also points towards the role of metacognitive awareness. Studies have found that patients affected with chronic and blood borne diseases such as hepatitis both chronic and acute need to be made mindful about their condition. Also, provision of psychological support in this regard leads to beneficial effects. Specifically, patients who are able to understand their disease, its treatment interventions, advances in medical sciences being made for the treatment of the diseases and most importantly, a detailed understanding about their thinking processes and psychological strengths are able to deal with the psychological and physical costs of the disease (Abqari et al., 2022; Swendeman et al., 2009). There is also research evidence to show that higher scores on grit and metacognitive awareness not only contribute towards an improved life satisfaction but also a better prognosis (Gutteling et al., 2008; Koerbel & Zucker, 2007). There is evidence to show that provision of psychological support and treatment interventions aimed at promoting resilience, grit and life satisfaction in patients with any health conditions (Zabihi et al., 2020). There is also some literature to show that better psychological health is significantly associated with improved functioning of the liver even in patients diagnosed with liver cirrhosis (Smith-Palmer et al., 2015; Kesen et al., 2019). The findings of the present study are also indicative of the need to provide therapies aimed specifically at promoting grit, metacognitive awareness and life satisfaction in patients with Hepatitis B and Hepatitis C especially for those who are at advanced stages of the disease.

Metacognitive awareness and depression were identified as having mediating influences on the association among grit and life satisfaction. The results of the study supported this hypothesis but when it comes to the literature, there is a gap in the studies assessed focusing on the mediating role of these constructs. One study in relevance to this hypothesis had found that depression mediates the presence of somatic symptoms experienced by patients with Hepatitis B and C (Koerbel & Zucker, 2007). It was also found that the severity of Hepatitis B and Hepatitis C was higher in those patients experiencing depression in comparison to non-depressive participants. Another study had shown that metacognitive awareness lead to positive healthcare outcomes for the patients through a positive mediating influence (Kim et al., 2009).

Conclusion

The study concludes how a significant association between grit and meta-cognition awareness. A negative association between grit and depression was also identified. It was also found that there is a significant and positive association b/w grit and life satisfaction. There was a significant negative relationship between meta-cognition awareness and depression Also, depression had a significant and negative association with life satisfaction. It was also found that no gender differences exist among patients with hepatitis b and hepatitis c in relevance to the role of grit, depression and life satisfaction. The findings of the study have shown that grit and metacognitive awareness have the potential to contribute towards better healthcare outcomes for patients both in psychological and physiological domains. The lack of literature on this area, however, is a major drawback which can potentially limit the external validity of the findings of the present investigation.

Suggestions

- Future studies should include more diverse and larger samples from different cities of Pakistan.
- Healthcare organizations, governmental bodies, doctors, psychologists and media personnel need to collaborate in relevance to promoting awareness about these diseases
- Policy making needs to be done in relevance to making hepatitis a top priority keeping in view its rising prevalence and limited treatment and support services available to patients belonging to rural backgrounds
- Specialized therapeutic interventions should be developed to enhance grit and metacognitive awareness among the patients which can potentially contribute towards their enhanced life satisfaction and can possibly lead to better physiological healthcare outcomes

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