

Quality of Life and Related Factors Among Hepatitis B Virus Infected Individuals

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Short Title: Quality of life and Hepatitis B infection

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1 **ABSTRACT**

2 **Introduction:** Hepatitis B is a health problem in the world, including Indonesia. We analyzed
3 several factors associated with the quality of life of chronic hepatitis B patients.

4 **Methods:** We obtained information from Hepatitis B patients using the WHO Quality of Life
5 questionnaire. Data analysis conducted in this study was a chi-square test and a multivariate
6 logistic regression model was used to calculate the odds ratios (OR).

7 **Results:** Housewives with hepatitis B had a better quality of life than employees ($P = 0.002$),
8 after adjusted with age, sex, and medicine regularly, they had 21 times higher quality of life (OR
9 = 21.51, CI 1.448-319.432, $P = 0.026$). Lower income in the family had a higher good and very
10 good quality life ($P = 0.001$), patients who covered by government social insurance feel a better
11 quality of life ($P = 0.006$). Also hepatitis B patients who diagnosed less than or equal 2 years and
12 duration treatment less than or equal 1 year were better quality life ($P = 0.002$; $P = 0.001$).
13 Patients were not taking medicine regularly and infected from husband had a lesser quality of life
14 ($P = 0.006$). After adjusted with age, sex and employment status, medicine regularly had 19
15 times higher quality of life than without (OR = 19.37, CI 1.144-327.785, $P = 0.040$). Patients
16 who reacted and feel shocked and denial had better quality of life ($P = 0.011$). However, we
17 could not find any association between sex, age, ethnics, marital status and educational
18 background with quality of life ($P = 0.962$, $P = 0.919$, $P = 0.320$, $P = 0.233$ and $P = 0.209$,
19 respectively).

20 **Conclusion:** The quality of life of hepatitis B patients influenced by several factors including the
21 length of time diagnosed, the environment support, routine treatment, complications, the severity
22 of the disease and economic factors.

23 **Keywords:** Quality of Life; Hepatitis B; Contributing Factors

1 INTRODUCTION

2 Hepatitis B is a major health burden in Indonesia, the second highest endemic hepatitis B
3 infection country in Southeast Asia after Myanmar (1). The high prevalence of hepatitis has a
4 potential to develop into a serious disease which can increase morbidity and mortality (2). About
5 50% of the patients have a potential chance become chronic liver disease and 10% have the
6 potential for liver fibrosis which can cause liver cancer (3,4). The liver cancer data, fibrosis and
7 another pathological complication of hepatitis B in Indonesia still not clear, however it is
8 hypothesized that 1.050.000 Indonesian patients have the potential to develop liver cancer (3,5).

9 Quality of life is a perception in individuals about the general condition both of the positive
10 and negative aspects based on the experience during their lives (6). Quality of life is greatly
11 influenced by the health status possessed by each individual (7). The concept of quality of life
12 related to health (HRQOL) has begun to be carried out research since the 1980s (6). Its has been
13 shown that there was an increasing of the ¹⁶ quality of life in patients with chronic condition such
14 as cancer, endstage kidney disease and stroke if they got better service from healthcare facilities
15 (7,8). Therefore, it ³ encompasses the entire range of human experience, states, perceptions and
16 spheres of thought concerning the life of an individual or a community (7). Both objective and
17 subjective quality of life can include cultural, physical, psychological, interpersonal, spiritual,
18 financial, political, temporal and philosophical dimensions (9). Quality of life implies a judgment
19 of value placed on the experience of the communities such as families or group of individuals
20 (10).

21 Research measuring the quality of life has been conducted for several years (11–13). Some
22 research assessed their quality of life using several questionnaires, including European quality of
23 life questionnaires (EQ-5D) (14), ⁷ health-related quality of life (HR-QoL) (7), ²⁴ and the world

1 health organization quality of life (WHOQOL) (15). In Indoensia, the WHOQOL was commonly
2 used because patients will be adjusted to the condition of the disease, including having to
3 measure several aspects which include physical health, social relationship, mental health, and
4 environmental health (14–16). In addition, the quality of life of each individual will be well
5 measured and able to describe patient's personal perception, patient's experience to maintaining
6 health and enjoying life, good or satisfied in the life and psychological condition to face the
7 condition (15). Because of detail assessment in measure quality of life, WHOQOL was chosen
8 by researcher ² to measure quality of life patient in chronic condition.

9 ¹⁶ The worsening condition of quality of life of chronic hepatitis B patients is influenced by a
10 number of contributing factors, including factors originating from the internal as well as support
11 from the surrounding environment (6,16). Hepatitis B, which requires a support system from
12 various parties, will affect patients in taking treatment (17). If the patient does not get a good
13 quality of life, the condition of the severity of hepatitis B will also get worse, especially patients
14 who have just been diagnosed with hepatitis B and the condition has experienced a delay
15 treatment ¹⁷ (2,6). Measuring quality of life is very important in the clinical management of
16 hepatitis B patients to prevent complications from the disease (6,7).

17 Although the prevalence of patients with HBsAg in Indonesian was decreased from 9.4%
18 in 2007 to 7.2% in 2012 (5,18), the number of Indonesian population with the Hepatitis B virus
19 is still high with more than 18 million people in 2017 (1,5). Importantly, East Java is ¹³ one of the
20 highest prevalence of hepatitis B from 33 cases in 2015 and increased to 432 cases in 2016.
21 Surabaya City is the highest prevalence area in East Java Province until 2019 is with a total of
22 219 cases, and Kenjeran is one of the districts with the most hepatitis B findings including

- 1 Sidotopo Wetan Primary Health Center. The purpose of this study is to analyze several factors
- 2 associated with the quality of life of chronic hepatitis B patients.

1 **METHODS**

2 From June - August 2019, a cross sectional study was conducted in the 31 patients with hepatitis
3 B who have received therapy or have just been diagnosed in Sidotopo Wetan Health Center.
4 Variable quality of life was measured using a shorter version of the WHO Quality of Life
5 (WHOQOL-BREF) which contain ⁸ 26 questions and four domains including physical health,
6 social relationship, mental health, and environmental health (8). We used evaluation scale of
7 Five Likert-style response scales (very poor to very good) with the scores vary from 1 to 5. The
8 first domain WHOQOL questionnaire is the patients's personal perception of ¹⁵ the quality of life
9 and comfort of the patient to their health. Then in the second part, is the patient's experience over
10 the past 2 years regarding the process of maintaining health and enjoying life. In the third part is
11 how is the patient ⁵ to say how good or satisfied you have felt about various aspects of their life
12 over the last two weeks. At the last part is how is the patient ⁵ to say how good or satisfied you
13 have felt about various aspects of your life over the last two weeks. Patients will be asked to fill
14 in the consent form and fill in the questionnaire given by the researcher autonomously and there
15 is no compulsion element.

16 We collected demographic data and the quality of life using questionnaire. We analyzed
17 sex and age, ethnics, marital status (single, married and divorce), educational background
18 (bachelor, ²³ senior high school, junior high school, elementary school and no education),
19 employment status (employee and housewife), income number (>1 million and ≤1 million),
20 insurance availability (available and none), duration of diagnostic >2 years and ≤2 years),
21 duration of treatment (≤1 years and >1 year), medicine regularly (yes and no), source of
22 transmission (husband and don't know), reaction to first diagnose (sad, shocked and ordinary
23 feeling) and meaning to first diagnose (acceptance, denial and ordinary feeling). The ²² study

1 protocol was approved by the Ethical Commission of Faculty of Nursing, Airlangga University,
2 the number of certificate is 1827-KEPK.

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4 **Statistical analysis**

5 Discrete variables were tested using the chi-square test; continuous variables were tested using
6 the Chi Square. A multivariate logistic regression model was used to calculate the odds ratios
7 (OR) of the clinical outcomes that included age, sex, employment status, and medicine regularly.
8 All determinants with P values of <0.10 were entered together into the full logistic regression
9 model, and the model was reduced by excluding variables with P values of >0.10. The OR and
10 95% confidence interval (CI) were used to estimate the risk. A P value of <0.05 was accepted as
11 statistically significant. The SPSS software, version 21.0 (SPSS Inc., Chicago, Illinois, USA)
12 was used for all statistical analyses.

1 **RESULTS**

2 **Demographical Characteristics of Respondents**

3 Most of the respondent was female (29/31, 93.5%) with aged between 19-37 years old. Among
4 the participants Javanese was predominant (20/31, 64.5%) and Madurese had a big proportion
5 (11/31, 35.5%). Elementary school graduated was predominant among patients (13/31, 41.9%).
6 Moreover, there was no educational background in the 1 patient. There was no big difference
7 between the proportion of those employee and housewives who have not worked since marriage
8 and at home only focus on taking care of their children and family life (15/31, 48.4% vs. 16/31,
9 51.6%). Similar proportion also was observed on the number of income (IDR >1 million [USD
10 71.5 currency on October 2019] was 15/31 (48.4%) vs. IDR <1 million was 16/31, 51.6%).
11 Unfortunately, 32.3% of patients do not have government social insurance. Half of them (14/31,
12 45.2%) were diagnosed more than 2 years. Most of patients were diagnosed during pregnancy
13 screening or voluntary for early detection due to had a risk from husband or other family
14 members. Even though they know they suffered hepatitis B, most were not taking medicine
15 regularly (20/31, 64.5%). Importantly, most of patients claimed that they were infected by their
16 husbands (21/31, 67.7%). Shocked, ordinary and acceptance as characteristics of the reaction
17 when first diagnosed were divided into equal proportions (11/31, 35.5%; 10/31, 32.3% and 8/31,
18 25.8%, respectively). Denial was higher proportion than ordinary as the characteristics of
19 meaning to first diagnose (13/31, 41.9% vs. 10/31, 32.3%).

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21 **Factors Contribute to Quality of life Hepatitis B Patients**

22 Among 31 patients, there was no patients who choose very poor, poor and moderate quality.
23 Housewife with hepatitis B had a better quality life than employee with $P = 0.002$ (11/15, 73.3%

1 vs. 4/15, 26.7% on good quality of life and 10/16, 62.5% vs. 6/16, 37.5%, Table 1). Moreover,
2 after adjusted with age, sex, and medicine regularly, housewife had 21 times higher quality of
3 life than employee (OR = 21.51, CI 1.448-319.432, P = 0.026). In contrast with our expectation,
4 hepatitis B patients with lower income had a higher good and very good quality life (9/15, 60.0%
5 and 10/16, 62.5%, respectively, P = 0.001). Hepatitis B patients who covered by government
6 social insurance feel a better quality life than without insurance (12/15, 80.0% and 18/16, 87.5%
7 vs. 3/15, 20.0% and 2/16, 12.5%, respectively for good and very good). In addition, hepatitis B
8 patients who diagnosed less than or equal 2 years and duration treatment less than or equal 1 year
9 were better quality life (9/15, 60.6%, P = 0.002 and 8/9, 88.8%, P = 0.001, respectively).
10 Interestingly, many patients have a good quality of life, even though Hepatitis B has been
11 diagnosed for more than 2 years. Maybe it is associated with support from partners, family,
12 friends, other hepatitis B sufferers, cadres and health workers. Patients were not taking medicine
13 regularly and husband source transmission had a lesser quality of life (6/15, 40.0% and 5/16,
14 31.4%, P = 0.09; and 6/15, 40.0% and 7/16, 43.6%, P = 0.006, respectively for good and very
15 good). Moreover, after adjusted with age, sex and employment status, medicine regularly had 19
16 times higher quality of life than without (OR = 19.37, CI 1.144-327.785, P = 0.040).
17 Additionally, patients who reacted and feel shocked and denial had better quality of life (9/15,
18 60.0% and 6/16, 19.4%, P = 0.002; and 9/15, 60.0%, P = 0.011 and 6/16, 19.4%, P = 0.011,
19 respectively). However, we could not find any association between sex, age, ethnics, marital
20 status and educational background with quality of life (P = 0.962, P = 0.919, P = 0.320, P =
21 0.233 and P = 0.209, respectively).

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1 **DISCUSSION**

2 In this study, we found the quality of life of hepatitis B patients has a close relationship with
3 occupation and medicine regularly. Patients who were do not work, such as a housewife had very
4 good quality of life than patients who work as employees. Housewives have a lot of time at home
5 and do not take care of other work outside the home, because they leave all work responsibilities
6 to the husband. Therefore, they may have lower stress levels (19,20). Compared to career
7 women who have a variety of jobs that require targets (21). In addition, housewives only take
8 care of life at home, they can take a rest and enjoy their free time to relax after all household
9 work. Whereas for career women, they has an obligation to take care of the household and work
10 and decreased quality of life (19,20). It is important for individuals with hepatitis B virus in their
11 body have to maintain stress to prevent their health worse.

12 A better quality of life was found in patients who take medication regularly due to the
13 better outcomes. Patients with active HBsAg still be able to survive normally and not fall into
14 sick conditions (18). The success of antiviral therapy to reduce viral load maintain the body still
15 healthy, thus giving them higher confidence and improving their quality of life (22). The
16 incidence of pain also has more potential to develop into complications, therefore the quality of
17 life will deteriorate (7). Quality of life will be better if the maturity of the age is in the productive
18 age range (20-50 years), while at a younger or older age the level of preparedness in dealing with
19 the disease is getting lower. The high level of education has a close relationship with the
20 readiness of the patients to accept the illness. Individuals with a higher level of education will
21 have more knowledge than those who did not get formal education (23). However, in this study,
22 patients with no educational history had better quality of life than bachelor's. After further
23 investigation, it is influenced by external factors, such as support from family, high self-

1 awareness, not working and do not have many other activities, thus their health conditions are
2 also well maintained.

3 The insurance availability from Indonesian government increased the quality of life
4 rather than subjects who do not have insurance. In contrast, the lower income level (less than 1
5 million) were associated of having a very good quality of life compared to high income level
6 (more than 1 million). In contrast with our findings, a study in Vietnam found that a higher
7 income level in Hepatitis B patients were associated to a lower risk of having depression due to a
8 higher awareness than patients with lower income about health (24). In addition, chronic kidney
9 disease patients study showed that individuals with a low-income has worse quality of life (25).
10 The social insurance may overcoming cost in their treatment. In addition, a low income is not
11 always associated with worse quality of life. A better social support and coping skills in
12 individuals was more important for increasing their quality of life despite their income (26).

13 In our study, individuals who were early diagnosed (≤ 2 years) had significantly
14 associated to the good quality of life. Patients who have pain may have depression which
15 worsens their quality of life with longer duration and greater severity (27). Another study
16 reported that the highest value of ⁷ health-related quality of life (HRQOL) was found in inactive
17 Hepatitis surface antigen (HBsAg) carriers and ² it can be worsen when the disease becomes active
18 (28). Duration ¹⁹ of treatment and the patient's control routine also had significantly association
19 with good quality of life. Because the duration of treatment affected that mobility, pain, and their
20 activities improved after 104 weeks of antiviral treatment in Chronic hepatitis B (CHB) (7).
21 Another study using the 36-Item Short-Form Health Survey (SF-36) in the patient's control
22 routine (treatment group), showed that the physical functions were significantly increased

1 (2,22). However, these results also reveal that taking medical regularly provided ² confidence to
2 patients and increased their quality of life (3).

3 Some of patients who do not know the source of transmission had significantly
4 association with good quality of life, it related with their coping mechanism. ⁴ Coping as the
5 cognitive and behavioral effort made to tolerate, reduce, or master demands that challenge or
6 exceed a person's resources (29). The acceptance of coping made quality of life better than
7 denial coping (30,31). ⁴ Denial has been shown to correlate with low self-esteem and depression
8 (31), Indeed, it ⁴ may be an expression of helplessness, anger, or depression, and these patients
9 may need of psychological intervention (29). Actually, in this study identified reaction and
10 meaning to the first diagnosed. This is consistent with the results of other studies obtained by the
11 SF-36 method, the majority of Hepatitis B patients had a lackluster reaction after knowing the
12 diagnosis of Hepatitis B, and it affected their quality of life (1). The reaction and meaning shown
13 can result in poor quality of life in patients that occur due to anxiety in physical limitations.
14 Patients with hepatitis B suffer from physical health disorders that are often accompanied by
15 symptoms of mental depression. In addition to the effects of hepatitis B on the liver, patients
16 with hepatitis B can show depression and decrease their quality of life (3).

17 Several implications can be drawn from this study, support from family members,
18 especially in the case of mental health problems should be promoted to reduce depression and
19 quality of life for hepatitis B patients. Integrated evaluation, as well as active participation in
20 consultation must be carried out during treatment ¹⁵ to improve the quality of life and emotional
21 state of HBV patients (6,14,16,22). In addition, WHOQOL has proven ¹¹ to be a useful instrument
22 for assessing general quality of life in patients and can help to find practical strategies to improve
23 quality of life in hepatitis B patients (15). Thus, health workers can use it to measure quality of

1 life practically and can determine interventions with each patient to prepare an appropriate level
2 of quality of life.

3 Some limitations of our study are low sample number, hence the results obtained from
4 this study may not be generalized for all Hepatitis B patients in Surabaya. Because WHOQOL
5 was not developed for the population of cirrhosis patients and this group of patients was not
6 included in this study. In addition, the course of the disease in patients and variations in quality
7 of life among patients during the monitoring period have limited data collection. Therefore,
8 bigger sample number and more well suited questionnaire is necessary.

1 CONCLUSION

2 The quality of life of patients influenced by the length of time diagnosed, support from the
3 environment, routine treatment and control to health facilities, complications and the severity of
4 the disease. Economic factors such as family income, work history, sources of funds, first
5 diagnostic test, patient's control routine, length of therapy and psychological response had
6 significantly association with the quality of life of hepatitis B patients.

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1 **TABLES**

2 Table 1. The Bivariate Analysis of Research Variables with The Quality of Life

No	Factors	Quality of life		P value	
		Good (%)	Very good (%)		
1	Sex	Male	1 (6.7)	1 (6.2)	P = 0.962
		Female	14 (93.3)	15 (93.8)	
2	Age	< 21 years old	2 (13.3)	3 (18.8)	P = 0.919
		21 – 35 years old	11 (73.4)	11 (68.8)	
		> 35 years old	2 (13.3)	2 (12.4)	
3	Ethnics	Javanese	11 (73.3)	9 (56.3)	P = 0.320
		Madura	4 (26.7)	7 (43.7)	
4	Marrital Status	Married	13 (86.7)	11 (68.8)	P = 0.233
		Divorce	2 (13.3)	5 (31.2)	
5	Educational background	Bachelor	1 (6.6)	0 (0.0)	P = 0.209
		Senior High School	4 (26.7)	5 (31.3)	
		Junior High School	4 (26.7)	2 (12.5)	
		Elementary School	6 (40.0)	8 (50.0)	
		No Educational background	0 (0.0)	1 (6.2)	
6	Occupation	Offical employee	4 (26.7)	6 (37.5)	P = 0.002*
		Housewife	11 (73.3)	10 (62.5)	
7	Income	> 1 million	6 (40.0)	6 (37.5)	P = 0.001*
		≤ 1 million	9 (60.0)	10 (62.5)	
8	Insurance of availability	BPJS	12 (80.0)	14 (87.5)	P = 0.006*
		Independent source	3 (20.0)	2 (12.5)	
9	Duration of diagnostic	>2 years	6 (40.0)	7 (43.6)	P = 0.002*
		≤2 years	9 (60.0)	9 (56.4)	
10	Duration of treatment	≤1 years	8 (53.3)	11 (68.6)	P = 0.001*
		>1 years	1 (6.7)	0 (0.0)	
11	Medicine regularly	Never	6 (40.0)	5 (31.4)	P = 0.009*
		Yes	9 (60.0)	11 (68.6)	
12	Source of transmission	Yes	6 (40.0)	5 (31.4)	P = 0.006*
		No	6 (40.0)	5 (31.4)	
13	Reaction to first diagnose	Husband	6 (40.0)	7 (43.6)	P = 0.006*
		Do not know	9 (60.0)	9 (56.4)	
14	Meaning to first diagnose	Sad	3 (20.0)	5 (16.1)	P = 0.002*
		Shocked	9 (60.0)	6 (19.4)	
		Ordinary feeling	3 (20.0)	5 (16.1)	
14	Meaning to first diagnose	Acceptance	3 (20.0)	5 (16.1)	P = 0.011*
		Denial	9 (60.0)	6 (19.4)	
		Ordinary feeling	3 (20.0)	5 (16.1)	

3 * Significant

4 BPJS = Government social insurance

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