

## Original Research Article

# The association of risk factors with psychiatric symptoms and quality of life in laryngopharyngeal reflux disease patients

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**Received:** 9 October 2020

**Revised:** 12 November 2020

**Accepted:** 13 November 2020

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### ABSTRACT

**Background:** Risk factors for laryngopharyngeal reflux (LPR), such as age, gender, BMI, smoking history and dietary habit affect the severity of LPR. These risk factors have a clinical impact on both social and emotional aspects, which can reduce the quality of life. Thus led the researchers to analyse association between these risk factors with psychiatric symptoms and quality of life for LPR sufferers.

**Methods:** Analytical descriptive research with cross-sectional approach to LPR patients in ENT clinic RSUP Dr. Kariadi Semarang. Sixty six samples aged 18-60 years and met the criteria of the researcher were measured using the DASS 21 questionnaire and the RQS questionnaire. Statistical analysis used the chi-square test.

**Results:** Obtained 66 subjects with a mean age of 45.1 years, there were more women than men (75.8%). Analysis of risk factors associated with depression found gender ( $p=1.000$ ), age ( $p=1.000$ ), duration of symptoms ( $p=1.000$ ), BMI ( $p=0.132$ ), smoking ( $p=0.452$ ), and diet ( $p=1.000$ ). Analysis of risk factors with anxiety obtained gender ( $p=0.340$ ), age ( $p=0.743$ ), duration of symptoms ( $p=0.085$ ), BMI ( $p=0.322$ ), smoking history ( $p=1.000$ ), and diet ( $p=1.000$ ). Analysis of risk factors with stress obtained gender ( $p=0.798$ ), age ( $p=0.088$ ), duration of symptoms ( $p=0.324$ ), BMI ( $p=0.276$ ), smoking history ( $p=0.606$ ) and diet ( $p=0.538$ ). Analysis of the gender association related to the quality of life LPR patients ( $p=0.032$ ).

**Conclusions:** Duration of symptoms, age, BMI, smoking history and diet were not associated with psychiatric symptoms and quality of life in LPR sufferers. Gender is not associated with psychiatric symptoms but is related to quality of life.

**Keywords:** LPR, Psychiatric symptoms, Quality of life, Risk factors

### INTRODUCTION

Laryngopharyngeal reflux (LPR) is defined as retrograde flow from gastric contents to the larynx and pharynx where the refluxate comes into contact with the upper aerodigestive tract.<sup>1</sup> The incidence of LPR is 10-15%, generally affecting people over 40 years (35%). The LPR case at Dr. Kariadi is 30 cases monthly.<sup>2-4</sup>

The diagnosis of LPR is based on a symptom score, physical findings, and investigations. LPR is diagnosed if a reflux symptom index (RSI) score is  $>13$  and reflux finding score (RFS) is  $>7$ . LPR is a big problem for public health because of its high incidence, which is about 10% of all patients who come to the ENT doctor's practice.<sup>1,5,6</sup>

Previous studies reported that risk factors for age, sex, BMI, smoking history and diet determine the severity of

LPR, which can lead to mental problems in patients. Duration of symptoms may be a risk factor because it can aggravate LPR. These risk factors have a clinical impact on both social and emotional aspects and can reduce the quality of life.<sup>7,8</sup>

Quality of life can be measured by a questionnaire, one of the questionnaires used is the RQS (reflux qual short-form). This quality of life instrument is LPR specific. This questionnaire has been validated, measuring the quality of life can predict the prognosis of LPR sufferers.<sup>8</sup> LPR is not associated with high mortality rates, but has an impact on the quality of life for people with LPR. This impact can cause problems for LPR sufferers and health service coverage problems.<sup>9-11</sup>

LPR is a chronic disease with complex symptoms, the length of treatment and the symptoms that do not improve can cause psychiatric problems for people with LPR. Anxiety, depression and stress can affect the quality of life for individuals with LPR. Previous studies have reported a correlation between LPR and psychosomatic disorders. Measurement of psychiatric symptoms using the DASS-21 (depression, anxiety, and stress scale) has been validated and translated into Indonesian.<sup>12-14</sup> The purpose of this study was to analyse the relationship between risk factors and psychiatric symptoms and quality of life for LPR sufferers.

**METHODS**

This study was a descriptive analytic study with a cross sectional approach to determine the association between risk factors and psychiatric symptoms and quality of life for LPR sufferers. The number of samples in this study was 66, sampling was carried out by consecutive sampling on patients who had been diagnosed with LPR who came to the ENT-Head and Neck clinic of RSUP Dr. Kariadi, Semarang in March - May 2020.

**Inclusion criteria**

18-60 years old and willing to be included in the study.

**Exclusion criteria**

Patients who had a history of psychiatric disorders before being diagnosed with LPR, a history of steroid use in the last 2 weeks, regular use of PPIs twice a day in the last 2 months, a history of having head and neck cancer, history of previous radiotherapy in the neck area in the last 1 year, history of other chronic diseases (DM, hypertension) and history of being in the treatment of psychiatric diseases.

Data recording, history and risk factors for LPR patients were recorded, then measured psychiatric symptoms using the DASS-21 questionnaire and quality of life using the RQS questionnaire. Ethical clearance was approved by the Research Ethics Commission RSUP Dr. Kariadi

Semarang, and the research permit was approved by the director of RSUP Dr. Kariadi Semarang. Statistical analysis was performed using SPSS software (version 21) and variables were analysed by chi-square test.

**RESULTS**

The research subjects were 66 with mean age of 45.1±11.29 years, the youngest was 18 years and the oldest was 60 years old. Age ranges of subjects were 18-39 years (30.3%) and ≥40-60 years (69.7%). Subjects with duration of symptoms <3 months were 39 patients (59.1%) and ≥3 months (40.9%). 51 people (77.3%) had normoweight BMI. 95.5% did not smoke. As many as 21.2% of patients had a history of consuming spicy or fatty foods, drinking tea, coffee or soda (Table 1).

**Table 1: Subject characteristics.**

| Variable                    | N  | %    |
|-----------------------------|----|------|
| <b>Sex</b>                  |    |      |
| Male                        | 16 | 24.2 |
| Female                      | 50 | 75.8 |
| <b>Age</b>                  |    |      |
| 18-39 years old             | 20 | 30.3 |
| ≥40-60 years old            | 46 | 69.7 |
| <b>Duration of symptoms</b> |    |      |
| <3 months                   | 39 | 59.1 |
| ≥3 months                   | 27 | 40.9 |
| <b>BMI</b>                  |    |      |
| Normoweight                 | 51 | 77.3 |
| Non-normoweight             | 15 | 22.7 |
| Underweight                 | 3  | 4.5  |
| Overweight                  | 10 | 15.2 |
| Obese                       | 2  | 3.0  |
| <b>Smoking history</b>      |    |      |
| Yes                         | 4  | 4.5  |
| No                          | 62 | 93.9 |
| <b>Dietary habit</b>        |    |      |
| Yes                         | 14 | 21.2 |
| No                          | 52 | 78.8 |
| <b>Depression</b>           |    |      |
| Yes                         | 9  | 13.6 |
| No                          | 57 | 86.4 |
| <b>Anxiety</b>              |    |      |
| Yes                         | 18 | 27.3 |
| No                          | 48 | 72.7 |
| <b>Stress</b>               |    |      |
| Yes                         | 23 | 34.8 |
| No                          | 43 | 65.2 |
| <b>Psychiatric symptoms</b> |    |      |
| 1                           | 15 | 22.7 |
| >1                          | 51 | 77.3 |
| <b>Quality of life</b>      |    |      |
| Good                        | 36 | 55.5 |
| Bad                         | 30 | 45.5 |

The most incidence of depression in women and aged ≤40-60 years. Study subjects with depression had almost

the same ratio in symptom duration. The highest BMI in the study sample with depression was normoweight (55.6%). Most of the samples had no history of smoking (88.9%) or a history of consuming spicy or fatty foods, drinking tea, coffee or soda (77.9%). There was no

significant relationship between risk factors for gender, age, duration of symptoms, BMI, smoking and diet with the incidence of depression (Table 2). Table 2 shows that the most incidence of depression is in the female sex and age 40-60 years.

**Table 2: The result of risk factors for depression.**

| Variable                    | Depression |      |    |      | P value | OR    | CI 95%       |
|-----------------------------|------------|------|----|------|---------|-------|--------------|
|                             | Yes        |      | No |      |         |       |              |
|                             | N          | %    | N  | %    |         |       |              |
| <b>Sex</b>                  |            |      |    |      |         |       |              |
| Male                        | 2          | 22.2 | 14 | 24.6 | 1.000   | 0.878 | 0.163-4.724  |
| Female                      | 7          | 77.8 | 43 | 75.4 |         |       |              |
| <b>Age</b>                  |            |      |    |      |         |       |              |
| 18-39 years old             | 3          | 33.3 | 17 | 29.8 | 1.000   | 1.176 | 0.263-5.260  |
| ≥40-60 years old            | 6          | 66.7 | 40 | 70.2 |         |       |              |
| <b>Duration of symptoms</b> |            |      |    |      |         |       |              |
| <3 months                   | 5          | 55.6 | 32 | 56.1 | 1.000   | 0.977 | 0.237-4.020  |
| ≥3 months                   | 4          | 44.4 | 25 | 43.9 |         |       |              |
| <b>BMI</b>                  |            |      |    |      |         |       |              |
| Normoweight                 | 5          | 55.6 | 46 | 80.7 | 0.192   | 3.345 | 0.769-14.553 |
| Non-normoweight             | 4          | 44.4 | 11 | 19.3 |         |       |              |
| <b>Smoking history</b>      |            |      |    |      |         |       |              |
| Yes                         | 1          | 11.1 | 3  | 5.3  | 0.452   | 2.250 | 0.208-24.356 |
| No                          | 8          | 88.9 | 54 | 94.7 |         |       |              |
| <b>Dietary habit</b>        |            |      |    |      |         |       |              |
| Yes                         | 2          | 22.2 | 12 | 21.1 | 1.000   | 1.071 | 0.197-5.839  |
| No                          | 7          | 77.8 | 45 | 78.9 |         |       |              |

\*Significant (p<0.05); Chi Square test

**Table 3: Results of the risk factor test for anxiety.**

| Variable                    | Anxiety |      |    |      | P value | OR    | CI 95%      |
|-----------------------------|---------|------|----|------|---------|-------|-------------|
|                             | Yes     |      | No |      |         |       |             |
|                             | N       | %    | N  | %    |         |       |             |
| <b>Sex</b>                  |         |      |    |      |         |       |             |
| Male                        | 6       | 33.3 | 10 | 20.8 | 0.340   | 1.900 | 0.571-6.323 |
| Female                      | 12      | 66.7 | 38 | 79.2 |         |       |             |
| <b>Age</b>                  |         |      |    |      |         |       |             |
| 18 – 39 years old           | 6       | 33.3 | 14 | 29.2 | 0.743   | 1.214 | 0.380-3.877 |
| ≥40 – 60 years old          | 12      | 66.7 | 34 | 70.8 |         |       |             |
| <b>Duration of symptoms</b> |         |      |    |      |         |       |             |
| < 3 months                  | 7       | 38.9 | 30 | 62.5 | 0.085   | 0.382 | 0.125-1.162 |
| ≥ 3 months                  | 11      | 61.1 | 18 | 37.5 |         |       |             |
| <b>BMI</b>                  |         |      |    |      |         |       |             |
| Normoweight                 | 12      | 66.7 | 39 | 81.3 | 0.322   | 2.167 | 0.640-7.331 |
| Non-normoweight             | 6       | 33.3 | 9  | 18.7 |         |       |             |
| <b>Smoking history</b>      |         |      |    |      |         |       |             |
| Yes                         | 1       | 5.6  | 3  | 6.3  | 1.000   | 0.882 | 0.086-9.077 |
| No                          | 17      | 94.4 | 45 | 93.8 |         |       |             |
| <b>Dietary habit</b>        |         |      |    |      |         |       |             |
| Yes                         | 4       | 22.2 | 10 | 20.8 | 1.000   | 1.086 | 0.293-4.030 |
| No                          | 14      | 77.8 | 38 | 79.2 |         |       |             |

\*Significant (p< 0.05); Chi Square test

Anxiety was common in women (66.7%), age ≤40-60 years (66.7%), duration of symptoms ≥3 months (61.1%), and BMI normoweight (66.7%). Most of the subject had no history of smoking (94.4%) or a history of consuming spicy or fatty foods, drinking tea, coffee or soda (77.8%).

From the results of data analysis, there was no significant relationship between laryngopharyngeal reflux risk factors, such as gender, age, duration of symptoms, BMI, smoking and diet with the incidence of anxiety (Table 3).

**Table 4: The result of risk factors for stress.**

| Variable                    | Stress |      |    |      | P value | OR    | CI 95%       |
|-----------------------------|--------|------|----|------|---------|-------|--------------|
|                             | Yes    |      | No |      |         |       |              |
|                             | N      | %    | N  | %    |         |       |              |
| <b>Sex</b>                  |        |      |    |      |         |       |              |
| Male                        | 6      | 26.1 | 10 | 23.3 | 0.798   | 1.165 | 0.362-3.749  |
| Female                      | 17     | 73.9 | 33 | 76.7 |         |       |              |
| <b>Age</b>                  |        |      |    |      |         |       |              |
| 18-39 years old             | 10     | 43.5 | 10 | 23.3 | 0.088   | 2.538 | 0.857-7.523  |
| ≥40-60 years old            | 13     | 56.5 | 33 | 76.7 |         |       |              |
| <b>Duration of symptoms</b> |        |      |    |      |         |       |              |
| <3 months                   | 11     | 47.8 | 26 | 60.5 | 0.324   | 0.599 | 0.216-1.664  |
| ≥3 months                   | 12     | 52.2 | 17 | 39.5 |         |       |              |
| <b>BMI</b>                  |        |      |    |      |         |       |              |
| Normoweight                 | 16     | 69.6 | 35 | 81.4 | 0.274   | 1.914 | 0.592-6.193  |
| Non-normoweight             | 7      | 30.4 | 8  | 18.6 |         |       |              |
| <b>Smoking history</b>      |        |      |    |      |         |       |              |
| Yes                         | 2      | 8.7  | 2  | 4.7  | 0.606   | 1.952 | 0.257-14.855 |
| No                          | 21     | 91.3 | 41 | 95.3 |         |       |              |
| <b>Dietary habit</b>        |        |      |    |      |         |       |              |
| Yes                         | 6      | 26.1 | 8  | 18.6 | 0.536   | 1.544 | 0.462-5.161  |
| No                          | 17     | 73.9 | 35 | 81.4 |         |       |              |

\*Significant (p<0.05); Chi Square test

**Table 5: The result of risk factors for psychiatric symptoms.**

| Variable                    | Psychiatric symptoms |      |    |      | P value | OR    | CI 95%        |
|-----------------------------|----------------------|------|----|------|---------|-------|---------------|
|                             | 1                    |      | >1 |      |         |       |               |
|                             | N                    | %    | N  | %    |         |       |               |
| <b>Sex</b>                  |                      |      |    |      |         |       |               |
| Male                        | 4                    | 26.7 | 12 | 23.5 | 1.000   | 0.846 | 0.227 – 3.150 |
| Female                      | 11                   | 73.3 | 39 | 76.5 |         |       |               |
| <b>Age</b>                  |                      |      |    |      |         |       |               |
| 18-39 years old             | 5                    | 33.3 | 15 | 29.4 | 0.759   | 0.833 | 0.243 – 2.854 |
| >40-60 years old            | 10                   | 66.7 | 36 | 70.6 |         |       |               |
| <b>Workers</b>              |                      |      |    |      |         |       |               |
| Yes                         | 7                    | 46.7 | 33 | 64.7 | 0.209   | 2.095 | 0.653 – 6.722 |
| No                          | 8                    | 53.3 | 18 | 35.3 |         |       |               |
| <b>Duration of symptoms</b> |                      |      |    |      |         |       |               |
| <3 months                   | 6                    | 40   | 31 | 60.8 | 0,154   | 2.325 | 0.717 – 7.536 |
| ≥3 months                   | 9                    | 60   | 20 | 39.2 |         |       |               |
| <b>BMI</b>                  |                      |      |    |      |         |       |               |
| Non-normoweight             | 5                    | 33.3 | 10 | 19.6 | 0.302   | 0.488 | 0.136 – 1.749 |
| Normoweight                 | 10                   | 66.7 | 41 | 80.4 |         |       |               |
| <b>Smoking history</b>      |                      |      |    |      |         |       |               |
| Yes                         | 1                    | 6.7  | 3  | 5.9  | 1.000   | 0.875 | 0.084 – 9.085 |
| No                          | 14                   | 93.3 | 48 | 94.1 |         |       |               |
| <b>Dietary habits</b>       |                      |      |    |      |         |       |               |
| Yes                         | 4                    | 26.7 | 10 | 19.6 | 0.720   | 0.671 | 0.176 – 2.554 |
| No                          | 11                   | 73.3 | 41 | 80.4 |         |       |               |

\*Significant (p<0.05); Chi Square test

**Table 6: The result of the risk factors on quality of life.**

| Variable                    | Quality of life |      |     |      | P value | OR    | CI 95%       |
|-----------------------------|-----------------|------|-----|------|---------|-------|--------------|
|                             | Good            |      | Bad |      |         |       |              |
|                             | N               | %    | N   | %    |         |       |              |
| <b>Sex</b>                  |                 |      |     |      |         |       |              |
| Male                        | 5               | 13.9 | 11  | 36.7 | 0.032*  | 3.589 | 1,080-11.935 |
| Female                      | 31              | 86.1 | 19  | 63.3 |         |       |              |
| <b>Age</b>                  |                 |      |     |      |         |       |              |
| 18-39 years old             | 10              | 27.8 | 10  | 33.3 | 0.625   | 1.300 | 0.454-3.725  |
| ≥40-60 years old            | 26              | 72.2 | 20  | 66.7 |         |       |              |
| <b>Duration of symptoms</b> |                 |      |     |      |         |       |              |
| <3 months                   | 21              | 58.3 | 16  | 53.3 | 0.684   | 0.816 | 0.307-2.167  |
| ≥3 months                   | 15              | 41.7 | 14  | 46.7 |         |       |              |
| <b>BMI</b>                  |                 |      |     |      |         |       |              |
| Normoweight                 | 29              | 80.6 | 22  | 73.3 | 0.486   | 1.506 | 0.474-4.786  |
| Non-normoweight             | 7               | 19.4 | 8   | 26.7 |         |       |              |
| <b>Smoking history</b>      |                 |      |     |      |         |       |              |
| Yes                         | 0               | 0    | 4   | 13.3 | -       | -     | -            |
| No                          | 36              | 100  | 26  | 86.7 |         |       |              |
| <b>Dietary habit</b>        |                 |      |     |      |         |       |              |
| Yes                         | 10              | 27.8 | 4   | 13.3 | 0.153   | 0.400 | 0.111-1.440  |
| No                          | 26              | 72.2 | 26  | 86.7 |         |       |              |

\*Significant (p<0.05); Chi Square test

The most stress incidence in women (73.9%) and aged ≤40-60 years (56.5%). The study subjects with stress had almost the same ratio for the duration of symptoms. The highest BMI in the study sample with stress was normoweight (69.6%). Most of the sample had no history of smoking (91.3%) or a history of consuming spicy or fatty foods, drinking tea, coffee or soda (73.9%). From the results of data analysis, there was no significant relationship between laryngopharyngeal reflux risk factors, such as gender, age, duration of symptoms, BMI, smoking and diet with stress events (Table 4).

Laryngopharyngeal reflux risk factors, such as gender has a significant relationship with quality of life, while age, duration of symptoms, BMI, smoking and diet have no significant relationship with the incidence of >1 psychiatric symptoms (Table 5).

Laryngopharyngeal reflux risk factors, such as gender has a significant relationship with quality of life, while age, duration of symptoms, BMI, smoking and diet have no significant relationship with quality of life (Table 6).

## DISCUSSION

This study involving 66 patients with LPR. The age group most at this research that age ≥40-60 years (69.7%). Previous studies reported that there were no statistically significant differences between age groups, but with increasing age it could lead to accumulation of gastric acid as well as damage to intrinsic defences,

prolonged gastric emptying mechanism, and changes in mucosal resistance.<sup>2-4</sup>

LPR patients more in the female sex as many as 50 people (75.8%) than male gender 16 (24.2%). This is in accordance with previous studies which reported that the incidence of LPR is more in women due to hormonal factors that can increase gastric secretion. There are changes in the mucosa of the larynx on a woman's menstrual cycle and variations pre progesterone hormone levels during the menstrual associated with vascular changes in the larynx.<sup>1,3,9</sup>

Duration of symptoms or duration of illness was not widely studied in patients with LPR, but the longer the symptoms may indicate a greater mucosal damage due to exposure to acid more. In this study the most patients experienced LPR symptoms for less than 3 months (59.1%). It can be caused LPR symptoms resemble symptoms of serious diseases such as cancer making the concerns of patients to seek immediate treatment so that the disease does not develop further into keganasan.<sup>7,15</sup>

Severe symptoms of LPR such as pharyngeal globus, persistent psychogenic cough, hoarseness and dysphagia can be a cause of stress, anxiety and depression. Symptoms of LPR such as hoarseness and the sensation of a foreign body in the throat can trigger patient anxiety because of his concern for a sign of malignancy. The sensation of sticking in the throat can appear continuously so that it can cause psychological disorders.<sup>15-17</sup> The results showed that there was no

significant association between risk factors as gender, age, duration of symptoms, BMI, smoking and diet with psychiatric symptoms: depression, anxiety and stress. In another study also reported that there was no relationship between gender, age, BMI, and smoking habits and the patient's quality of life for LPR.

LPR is a clinical problem with a negative impact on quality of life. LPR has various clinical manifestations that may affect daily activities. LPR is a chronic disease with symptoms that can persist and recur, necessitating treatment and therapy should be repeated. LPR patients must also take medication continuously for long periods and drug effects were slow in providing symptomatic improvement.<sup>11,18</sup> This condition will affect the quality of life. The results of this study found that gender was associated with quality of life ( $p=0.032$ ), while age ( $p=0.625$ ), duration of symptoms ( $p=0.684$ ), BMI ( $p=0.486$ ), smoking ( $p=0.238$ ) and diet habits ( $p=0.153$ ) have no effect on quality of life. The previous study reported that there was no relationship between gender and quality of life. In women, the quality of life tends to be worse than men due to stress levels and hormonal fluctuations. In addition, women face more social and domestic problems.<sup>11,19</sup>

The limitations of this study were not assessed for other factors that affect quality of life such as overall health status and social functioning, other psychiatric illnesses were not taken into account such as personality disorders, severity of symptoms was not identified and post-therapy follow-up was not carried out as a comparative evaluation of the improvement in the patient's quality of life.

## CONCLUSION

Duration of symptoms, age, gender, BMI, smoking and dietary habits not associated with psychiatric symptoms in patients with LPR. Gender is related to the quality of life of people with LPR; duration of symptoms, age, BMI, smoking history and dietary habits did not correlate with quality of life for LPR sufferers.

*Funding: No funding sources*

*Conflict of interest: None declared*

*Ethical approval: The study was approved by the Health Research Ethics Committee RSUP Dr, Kariadi Semarang, No.451/EC/KEPK-RSDK/VI/2020*

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**Cite this article as:** Ramadhani A, Dewi AMK, Yunika K, Budiarti R, Ruspita DA, Farokah, et al. The association of risk factors with psychiatric symptoms and quality of life in laryngopharyngeal reflux disease patients. *Int J Res Med Sci* 2020;8:4251-7.