Author's response to reviews

Title: Evaluating vision-related quality of life in preoperative cataract patients and analyzing its influencing factors in China: a cross-sectional study

Authors:

Min Zhu (zmmin2002@126.com)
Jiaming Yu (cmu4h_yjm@126.com)
Jinsong Zhang (55903724@qq.com)
Qichang Yan (121418535@qq.com)
Yang Liu (cmu_liuyang@163.com)

Version: 3 Date: 29 August 2015

Author's response to reviews: see over
Reviewer and Editor Comments to Author:

Reviewer    Haidong Zou
Comments to the Author:
The authors used the Chinese language version NEI-VFQ-25 to describe the vision related quality of life change in cataract patients. In general, the results are interesting. However, as noted below there are some major points which need clarification. I suggest a major revision of this manuscript, subject to the authors' responding to the points raised below.
As English is not the first language of the authors, I strongly recommend that a native English writer be asked to review the grammar and syntax of the revised paper before resubmission.
Answer: Thank you for your comments. According to your suggestions, we revised the manuscript. Please see the following paragraphs. And the revised paper has been reviewed by Edanz recommended by BioMed Central.
The points that need attention are as follows:
1. The formation of original NEI-VFQ-25 LVQOL and the Chinese language version should both be cited in the first part.
Answer: Thank you very much. We cited both the formation of original NEI-VFQ-25 LVQOL and the Chinese language version in the first part of the manuscript according to your suggestion. Please see the third paragraph in the first part (Background). For your convenience, the revisions were presented in the following paragraph:

    The National Eye Institute Visual Function Questionnaire-25 (NEI-VFQ-25) is a reliable questionnaire used to evaluate vision-related quality of life. The original NEI-VFQ-25, which was a shortened version of NEI-VFQ-51, was developed by Mangione and co-workers, and is presently widely used widely by many countries throughout the world. The Chinese version of NEI-VFQ-25 (CHI-NEI-VFQ-25) was developed by Chan and co-workers in Hong Kong. They showed that this
questionnaire was an effective means in assessing the vision-related quality of life in Chinese patients with eye diseases.

2. Has the Chinese language NEI-VFQ-25 been reviewed for culture adaption in the China mainland? Hong Kong and Shenyang are not culturally equivalent. I would strongly suggest a review committee including doctors, nurses, patients, and healthy subjects to adapt the questionnaire before this study.

Answer: Thank you very much for your suggestion. We also considered the problem of culture adaption in mainland China. In order to know whether the Chinese language NEI-VFQ-25 was suitable for mainland China, we make a pilot test. First, we asked three ophthalmologists and three nurses to read the Chinese version of NEI-VFQ-25. The doctors and nurses thought that the questions were suitable for mainland patients, except for the driving subscale. Second, we investigated 20 preoperative cataract patients with the Chinese language NEI-VFQ-25. The patients could understand the questionnaire very well. There was only one problem that most of the patients did not drive. Because the average age of the patients was 69 years old, and most of them never have driving experience. So the driving subscale was omitted, when we calculated the composite score. However, considering now more and more Chinese people began driving cars in China, the driving subscale should be kept in the Chinese language NEI-VFQ-25.

3. For the interview method, does the authors mean that it was administered by an interviewer? Is this how it designed to be administered, or is it intended for self-completion in those whose vision is less severely impaired?

Answer: Thank you very much. The interview was administered by the first author Min Zhu. Because this study was part of Min Zhu’s doctoral dissertation. In order to ensure the quality of the research, she interviewed all the patients by herself. The process is: Min Zhu read each question in the questionnaire to the patient; the patient selects his answer and she writes down the answer; all the patients were interviewed by her one by one.
4. A major question is about the visual acuity perimeter used in this manuscript: why the authors used best corrected visual acuity (BCVA) instead of presenting or daily living visual acuity? Only if all the subjects enrolled wear the proper glasses (far-sight and near-sight), the BCVA will be considered relating to their daily vision function.

Answer: Thank you for your comments. In this study, we used BCVA instead of presenting or daily living visual acuity. There are two reasons. First, we got visual acuity from the patients’ medical record. The doctors always measured BCVA. Second, patients were divided into 4 groups according to the categories of visual impairment of World Health Organization. The categories of visual impairment divided by World Health Organization were based on BCVA. So we adopted BCVA to be consistent with the standard of WHO.

During the interview, we found that most of the patients always did their best to correct vision by wearing glasses, after their visual acuity began to decrease. Only when the vision could not be corrected, they would seek cataract surgery. So BCVA could represent their daily vision function for the patients who were going to have a cataract surgery.

5. The authors tested convergent item validity and item discriminant validity, and I will suggest they test more criteria values, such as test-retest reliability and item internal consistency. References should be given for all the criteria values used in assessments.

Answer: Thank you very much for your suggestion. We had tested the item internal consistency, but we did not make a clear description. We revised the manuscript as “The Cronbach α coefficient was used to determine the internal consistency of the items.” Please see the first paragraph in the section of reliability and validity.

We were sorry that we could not provide the test-retest reliability in this study. We interviewed the patients the day before surgery and they would discharge from hospital the fifth day after surgery. Totally the patients stayed in the hospital for about 7 days. The test-retest reliability requires that the duration time between the first test
and the second test could not be too short. And we had a lot of difficulties in following these patients, after they discharged from hospital. In addition, the states of the patients were changed after surgery. Because of the above reasons, we could not test the test-retest reliability. We felt sorry about that.

According to your suggestion, the references had been given for all the criteria values used in assessments. Please refer to the section of reliability and validity.

6. I would say the authors evaluated mostly on the vision impairment, but not on cataract. Different eye diseases, such as age-related macular degeneration, corneal diseases will result in the similar BCVA impairment. A “know-group” comparison would provide adequate information about specific cataract related quality of life impairment, and that is strongly suggested.

Answer: Thank you very much for your comments and suggestion. The aim of NEI-VFQ-25 was to evaluate quality of life caused by visual impairment. The main clinical manifestation of cataract was visual impairment. So it was suitable to use visual impairment for describing the quality of life in cataract patients. However, just as you said, other eye diseases, such as age-related macular degeneration, corneal diseases would result in the similar BCVA impairment. In this study, we only hoped to explore the influence of visual impairment caused by cataract on patients’ quality of life. We evaluated these patients quality of life, which would be very helpful for people to understand the status of the patients’ quality of life in different stage of cataract visual impairment. As to other eye diseases which would result in the similar BCVA impairment, it was most likely to have the similar results by using NEI-VFQ-25. Just as you suggested, a “know-group” comparison would provide adequate information about specific cataract related quality of life impairment. We thought that you gave us a very good suggestion. We went through some related reference about eye disease. We found that the clinical manifestation of glaucoma and diabetic retinopathy had big difference from cataract. However, the age-related macular degeneration and corneal diseases almost had the same clinical manifestation as cataract, the three diseases all caused decreased visual acuity nearly without other
symptoms. For patients with any of the three diseases may have similar symptoms. So it was difficult to compare the difference of vision-related quality of life impairment among cataract, age-related macular degeneration and corneal diseases by using NEI-VFQ-25. In order to emphasize the characteristics of cataract visual impairment, we revised the manuscript as “Regression analyses also proved that the BCVA in the better eye was a significant determinant of the quality of life. Chan et al. also reported that the visual acuity in the better eye had a high correlation with the quality of life, and the response of patients in our study indicated that the primary cause for the decrease in the quality of life was the reduction or loss of visual acuity. Broman et al. reported that the impact of cataracts on the quality of life was largely mediated through its effect on visual acuity; glaucoma and diabetic retinopathy probably had other effects besides visual acuity that had an impact on the quality of life. Thus, vision rehabilitation through surgery will significantly improve the quality of life for cataract patients.” Please refer to the fourth paragraph of discussion.

Your suggestion gave us an important implication that NEI-VFQ-25 could evaluate vision related quality of life, but NEI-VFQ-25 may not differentiate the difference of the quality of life among some eye diseases, such as cataract and age-related macular degeneration. So in the future, we will do some research on the characteristics of quality of life in patients with different eye diseases. Thank you very much!

7. Mean scores have been presented without any information provided regarding the distributions of scores. Are the scores at all time points distributed normally? Typically, questionnaire scores do not follow Gaussian distributions, so that means and standard deviations are not good summary measures. If they prefer to focus on the scores rather than changes in the scores, then medians and ranges (or interquartile ranges) may be more appropriate summary measures unless they can state that all distributions are Gaussian or nearly so.

Answer: Thank you for your comments. We tested the distribution of scores with K-S test. The results showed that the data did not distribute normally or nearly. So we used medians and ranges as the summary measures. As the data did not distribute normally
or nearly, the Kruskal-Wallis rank sum test was performed to compare the composite score and subscale scores among cataract patients with different socio-demographic characteristics and different vision statuses. If the results of Kruskal-Wallis rank sum test showed statistical difference, the Wilcoxon rank sum test was used to perform pairwise comparisons. And multinomial logistic regression was used to determine the potential factors influencing of the composite score and subscale scores. We analyzed the data with the above statistical methods. Thank you very much for your important suggestions.

8. The results section mentions a comparison of scores by age, educational status, marital status, etc. Were there any prior hypotheses (e.g. based on the original Chinese language version NEI-VFQ-25) regarding the nature, magnitude and direction of the relationship between NEI-VFQ-25 scores and these demographic variables? If a difference was expected, but not found, would this be a matter of concern regarding validity and/or discriminatory power?

Answer: Thank you very much for your comments. Previous studies found that the quality of life in a patient would be influenced by his demographic characteristics. Broman AT et al. explored the relationship between NEI-VFQ-25 scores and some demographic characteristics, such as age, gender, education level, income (Broman AT, Munoz B, West SK, Rodriguez J, Sanchez R, Snyder R et al. Psychometric Properties of the 25-Item NEI-VFQ in a Hispanic Population: Proyecto VER. Invest Ophthalmol. Vis. Sci. 2001;42:606-613). The study in Hong Kong which developed the Chinese version of NEI-VFQ-25 compared the scores in different age groups and different education groups (Chan CW, Wong D, Lam CL, McGhee S, Lai WW. Development of a Chinese version of the National Eye Institute Visual Function Questionnaire (CHI-VFQ-25) as a tool to study patients with eye diseases in Hong Kong. Br. J. Ophthalmo. 2009;93: 1431–1436). However, we did not find studies which especially research the relationship between the NEI-VFQ-25 scores and demographic characteristics using the Chinese version of NEI-VFQ-25. So we explored the relationship between the NEI-VFQ-25 scores and demographic
characteristics in mainland China, and compared our results with the previous studies. If a difference was expected, but not found. We thought there were many reasons. For example, it might be a matter of concern regarding validity and/or discriminatory power, as you suggested; or the parameter might have limited effect on the quality of life, we might need a large sample size to find the difference, etc. Thus, it was necessary to explore the relationship between the NEI-VFQ-25 scores and demographic characteristics.

9. In the discussion of the logistic regression analyses, it was unclear whether individual independent variables were evaluated first in univariate models and those results used to select variables to be included in multivariate models or whether only multivariate models were used.

Answer: Thank you for your comments and sorry about the unclear statement. In our study, the individual independent variables were evaluated first in univariate models. Only the independent variables that had significant statistical difference in the univariate models would be introduced into the multivariate models. We added a sentence in the sixth paragraph of discussion as “The demographic variables which had statistical significance in the Kruskal–Wallis rank sum test were introduced into the multinomial logistic regression model, and showed that sex, age, and educational attainment played an important role in self-reported, vision-related quality of life.”

Reviewer Yi Lu

Comments to the Author:
The authors evaluated vision-related quality of life in Chinese cataract patients and analyzed its influencing factors though the Chinese version of the National Eye Institute Visual Function Questionnaire-25 in this manuscript. They found that BCVA was the most important factor in vision-related quality of life and visual impairment had more impact on the psychosocial life of the patients. Both age and education attainment influenced the quality of life in cataract patients. However, there are still some questions which should be concerned.
Answer: Thank you for your comments. According to your suggestion, we revised the manuscript. Please see the following paragraphs.

Major Compulsory Revisions

1. The introduction and discussion should be shortened and the discussion should focus more on the findings of the study. The impact of visual impairment on quality of life was already mentioned in the introduction and should not be repeated in such a detail in discussion for example. Also the paragraphs discussing the prevalence of cataract is not necessary and should be shortened. The details of CHI-NEI-VFQ-25 should be described in discussion.

Answer: Thank you for your suggestion. The paragraph discussing the prevalence of cataract in the introduction was shortened. We revised the first paragraph as the following:

Cataracts are the leading cause of visual disability in China, accounting for over 60% of these disabilities, and visual disabilities caused by cataracts have become a major public health problem in China. Notwithstanding the efforts of the Chinese government to increase the number of cataract surgeries, not all patients with cataracts can have their quality of vision restored in a sufficiently short time, because of the country’s large backlog of patients. Consequently, a significant number of cataract patients must endure the suffering and hardship caused by visual impairment for extended periods of time, resulting in decreases in their quality of life.

Thank you for your important suggestion. We thought that the description of CHI-NEI-VFQ-25 was an important part in this manuscript and we added it in the section of instruments and interview. The description of CHI-NEI-VFQ-25 was as the following:

The CHI-NEI-VFQ-25 consisted of 25 questions, grouped into one question assessing general health, and 11 subscales involving visual difficulties in everyday life, as well as vision-related psychosocial parameters such as mental health, social function, and role difficulties. Each subscale included one or more questions. The original answer to each question was converted to 0–100 points; 100 was the best
possible score, and 0 was the worst possible score. The subscale scores were the average of one or more questions. The composite score of the NEI-VFQ-25 was the average of all the questions, except for the question about assessing general health. The higher the composite score, the better the visual function.

The manuscript was reviewed by Edanz before we submitted it to the journal. Please see the revised manuscript. Thank you again.

2. The language of this manuscript has problems in description, fluency and grammar. It is confused in description of some sentences, for example in discussion, first paragraph, “The excessively low response rate (96.8%) regarding the driving subscale may have caused in the lower Cronbach $\alpha$ coefficient in this subscale” and second paragraph “On the whole,”. “The excessively high non-response rate (96.8%)” should be better. Please have English language usage reviewed by a native English speaker.

Answer: Thank you very much! According to your suggestion, we revised the sentence as “The excessively high non-response rate (96.8%) of the driving subscale may have caused the lower Cronbach $\alpha$ coefficient in this subscale”, and deleted “On the whole”. The manuscript was reviewed by Edanz. Please see the revised manuscript.

3. Part of the discussion seemed redundant and should be simplified. For example, discussion section, fifth paragraph, “BCVA in the better eye was the most important determinant associated with the steepness of the decrease in vision-related quality of life.” and “The results suggested that the BCVA in the better eye was significantly associated with the steepness of the decrease in vision-related quality of life.”. The two sentences means the same.

Answer: Thank you for your suggestion. We revised the first sentence as “The results of our study also showed that the BCVA in the better eye was the most important determinant associated with a rapid decrease in the vision-related quality of life.” and deleted the sentence “The results suggested that the BCVA in the better eye was significantly associated with the steepness of the decrease in vision-related quality of
life.” We also revised other part of the discussion and simplified the discussion. Please refer to the revised manuscript.

4. As regards the results section: influencing factors of the composite score and subscale scores. Please, reformulate this paragraph, because is not clearly stated. The positively related factors and negatively related factors should be listed separately.

Answer: Thank you for your suggestion and sorry about the unclear statement. We reformulated this section. The revised paragraph was as the following:

The associations of the subscale scores and composite scores with demographic characteristics are shown in Table 3. The positive influencing factors included educational attainment and household income; the negative influencing factors included age, employment status, and marital status. The sex was positively associated with the subscale score of ocular pain, but negatively associated with the subscale scores of distance vision activities and dependence.

5. The authors should describe the surgical complications and compared the BCVA (should be in logMAR for analyze). They also should analyze the relationship between surgical complications and questionnaire scores.

Answer: Thank you for your suggestion. To describe the surgical complications, we inserted a sentence in the second paragraph of the discussion, which was “In general, when the visual acuity was lower than 0.3, or when a cataract interfered with normal daily activities, the patient needed surgery in mainland China. Inpatients with these conditions for surgery were expected to have lower visual acuity and lower NEI-VFQ scores.” The surgical complications were mainly expressed by visual acuity. We tried to analyze the relationship between the BCVA (expressed in logMAR) and the questionnaire scores. But through literature review, we found a problem that finger counting, hand movement, and light perception were difficult to be expressed in logMAR. So we thought that it might be better to divide the BCVA into 4 vision status groups, including blindness, low vision, monocular visual impairment and mild visual impairment. We compared the average questionnaire scores in the 4 vision
status groups, which could also show the relationship between the BCVA and the questionnaire scores. The revisions were made as the following:

1) The second paragraph of Composite and subscale scores of the CHI-NEI-VFQ-25 in the results section.

   Except for the general health and ocular pain subscale scores, the subscale scores and composite scores among the four visual status groups were significantly different (P < 0.01). The median composite score for the blind group was 30 lower than that of the low vision group, 40.9 lower than that of the monocular visual impairment group, and 38.4 lower than that of the mild visual impairment group (Table 2). The median composite score in the low vision group was 17.9 lower than the monocular visual impairment group, and 15.4 lower than the mild visual impairment group (Table 2). There were no significant differences in the scores between patients with monocular visual impairment and patients with mild visual impairment (P > 0.05).

2) The fourth paragraph of the discussion

   The results of our study also showed that the BCVA in the better eye was the most important determinant associated with a rapid decrease in the vision-related quality of life. Except for the subscale of general health and ocular pain, the subscale scores and composite score of the blind and low vision groups were much lower than the mild visual impairment group. However, the scores between the monocular visual impairment and mild visual impairment groups were not significantly different. Although the patients with mild visual impairment had better BCVA in the worse eye, the BCVA in the better eye of these patients was not always better than the patients with monocular visual impairment.

   Please refer to the revised manuscript. Thank you!

6. The authors should emphasized more on the clinical meaning of the results, and explain the difference compared with other researches (disease/countries).

   Answer: Thank you for your suggestion. We compared our results with other studies from Taiwan and Japan, and revised the discussion in the perspective of more emphasizing on the clinical meaning of the results. The revisions of the discussion
were made as the following:

1) We revised the second paragraph of the discussion:

The composite score of Chinese cataract patients (63.0) was lower than those of previous studies. The composite scores of outpatients with cataracts in Taiwan and Japan were 73.5 (n = 53) and 66.0 (n = 96), respectively. These differences could result from the different characteristics of the patients. Patients in our study were in-patients who were about to receive cataract surgery, while patients in these previous studies were outpatients. In general, when the visual acuity was lower than 0.3, or when a cataract interfered with normal daily activities, the patient needed surgery in mainland China. Inpatients with these conditions for surgery were expected to have lower visual acuity and lower NEI-VFQ scores. However, the conditions for outpatients were uncertain, and their visual acuities may not have been seriously impaired.

2) We revised the fourth paragraph of the discussion:

Regression analyses also proved that the BCVA in the better eye was a significant determinant of the quality of life. Chan et al. also reported that the visual acuity in the better eye had a high correlation with the quality of life, and the response of patients in our study indicated that the primary cause for the decrease in the quality of life was the reduction or loss of visual acuity. Broman et al. reported that the impact of cataracts on the quality of life was largely mediated through its effect on visual acuity; glaucoma and diabetic retinopathy probably had other effects besides visual acuity that had an impact on the quality of life. Thus, vision rehabilitation through surgery will significantly improve the quality of life for cataract patients.

Minor Essential Revisions

1. The mean BCVA before and after cataract surgery should be listed in the manuscript, and all the data should be converted in logMAR VA.

Answer: Thank you for your suggestion. We listed the mean BCVA before cataract surgery in the general characteristics of the samples of the results. However, it was difficult for us to express visual acuity by logMAR, because finger counting, hand
movement, and light perception were difficult to be expressed in logMAR. So we revised the sentence as “The mean BCVA in the better eye of the patients was 0.4 (median).”

In this study, we investigated the patients the day before they undergone cataract surgery and we got their visual acuity before surgery from the medical records. The visual acuity after surgery should be tested after a period time of recovering. So it was very difficult for us to follow up the patients and obtain their visual acuity after they discharged from hospital. We felt sorry about that.

2. As regards the results section: influencing factors of the composite score and subscale scores. What do the authors mean when they state: "To control for the effect of visual acuity "? Please, reformulate this sentence, because is not clearly stated.

Answer: Thank you very much. We are sorry for the unclear statement. Vision status was an important determinant of the quality of life. If we did not introduce vision status in the regression, it would disturb the results of the multinomial logistic regression. The revisions were made as “As visual acuity was the dominate factor in determining the quality of life, the visual status was also introduced into the regression model as a variable.”

3. As regards the results section: General characteristics of the samples. “An income of 2000-3000 RMB was most common.” Do the authors means per month?

Answer: Thank you for your suggestion and sorry about the unclear statement. We revised the sentence as “An income of 2,000–3,000 RMB per month was most common”.

4. As regards the discussion section, seventh paragraph, “This study observed that the composite scores, the subscale scores of general health, near vision activities, distance vision activities, dependence, social function, and peripheral vision among participants in different age groups decreased from the younger age group to the older
age group (P<0.05).” should be described as “This study observed that……peripheral vision are positively related with age”. Or the authors should list the scores in different age groups in table.

Answer: Thank you very much. We had revised the sentence as you suggested. Because the data did not distribute normally, we used Kruskal-Wallis rank sum test and multinomial logistic regression to analyze the data again. So the revisions were made as “Our findings provided further evidence that visual impairment had a greater impact on the quality of life of older adults, with the composite scores and the subscale scores of social function negatively related with age”.

5. The results of SNK test was too long to be listed in the footnote in Table 2. Please simplify the results or described in the results section.

Answer: Thank you for your suggestion. As the score data did not distribute normally, we used the Wilcoxon rank sum test to perform pairwise comparisons. And we simplified the note in table 2. The revisions were made as “The scores in the four vision status groups were significantly different, P < 0.01. The Wilcoxon rank sum test was used to perform pairwise comparisons; The median of the composite scores and the medians of the subscale scores between any two vision status groups were significantly different (P < 0.017), except for the difference between the monocular visual impairment group and the mild visual impairment group (P > 0.05).”

6. In table 3, foot note, “:- significantly negatively associated, P<0.05” should be “P>0.05”.

Answer: Thank you for your suggestion. We are sorry for that unclear statement. The revisions were made as “+, positively correlated, P < 0.05; 0, not significantly correlated; -, negatively correlated, P < 0.05.” We must make some explanation about the foot note of table 3.

“+, positively correlated, P < 0.05” meant the two variables were significantly associated with each other, and their relationship was positive.

“-, negatively correlated, P < 0.05” meant the two variables were significantly
associated with each other, and their relationship was negative. Both “+” and “-” indicated that the relationship between two variables had significance statistically, but only the direction of the relationship between the two variables were different.

“0, not significantly correlated” meant the two variables were not significantly associated with each other.

7. As the authors had listed the exact value of P, so there is no need to add * on the values.
Answer: Thank you for your suggestion. We have deleted * in table 4.

Editor's Additional Request:
1. Please clarify if informed consent was written or verbal.
Answer: Thank you very much. As the patients had poor eyesight, the interviewer read the informed consent to each patient before enrollment. When the patients agreed the informed consent, the interview would continue. We have clarified this in the manuscript. The revision was made as “Verbal agreement for informed consent was obtained from all patients.” Please refer to the second paragraph of the population.

2. Funding statement needs to be moved from the Competing Interest into to Acknowledgement.
Answer: Thank you for your suggestion. We have moved the funding statement from the Competing Interest into to Acknowledgement. The revision was made as the following:

This study was supported by the Chinese National Natural Science Foundation (NSFC81273034) and the Natural Science Foundation of Liaoning Province (Grant No: 2014021009). We would like to thank Chinese National Natural Science Foundation and Liaoning Province Natural Science Foundation for their vital financial support. The authors grateful appreciate the ophthalmology department of the fourth affiliated hospital of China Medical University for their support in this study.
3. Requesting for Copy-Edit

Answer: Thank you for your suggestion. The manuscript was copy-edited by Edanz before we submitted it.