Short Dry Eye Screening Questionnaire (JDEQS) in comparison with the established OSDI questionnaire

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Introduction:

- The awareness of the dry eye has increased over the past three decades [1]
    - Which is a growing problem in society [1]

- The prevalence of dry eye worldwide ranges between 5% and 34% according to literature [1,4]
    - In Germany alone, 4.03 to 27.37 million people are affected [4]

- Many research groups have focused on this area of expertise to learn more about the fundamentals and effects of the dry eye[1]

- Dry Eye Questionnaires are used to determine the severity of the disease and give a preliminary classification of the degree of dry eye [2]
    - They provide information about the frequency and intensity of the symptoms, environmental influences and medication [3]

- In recent years, there has been an increasing amount of studies on the diagnosis of dry eye using questionnaires
    - The results show that the symptoms alone are not sufficient for the diagnosis and treatment of dry eye disease (DED) [5]
    - In addition objective measurements are required for the DED diagnosis, which especially ought to include tests for the determination of the quality and quantity of the tear film [5]

Purpose:

Primary objective:

- The comparison of the new JENA DRY EYE QUESTIONNAIRE SHORT (JDEQS) with the OCULAR SURFACE DISEASE INDEX (OSDI) for the determination of dry eye in order to confirm an agreement between them

Secondary objective:

- The evaluation of both questionnaires regarding time expenditure and comprehensibility

Methods:

Pilot Study:

- 25 subjects [17 women, 8 men, average age 25.4 years (SD = 1.9)] answered and evaluated the JDEQS and OSDI questionnaire
    - The subjects evaluated the questionnaires related to expenditure of time, comprehensibility and preference on an analogue scale from 0 (worse) to 100 (best) points (Fig. 1)
    - In a comment section the subjects were able to add comments and/or questions they missed in the questionnaire
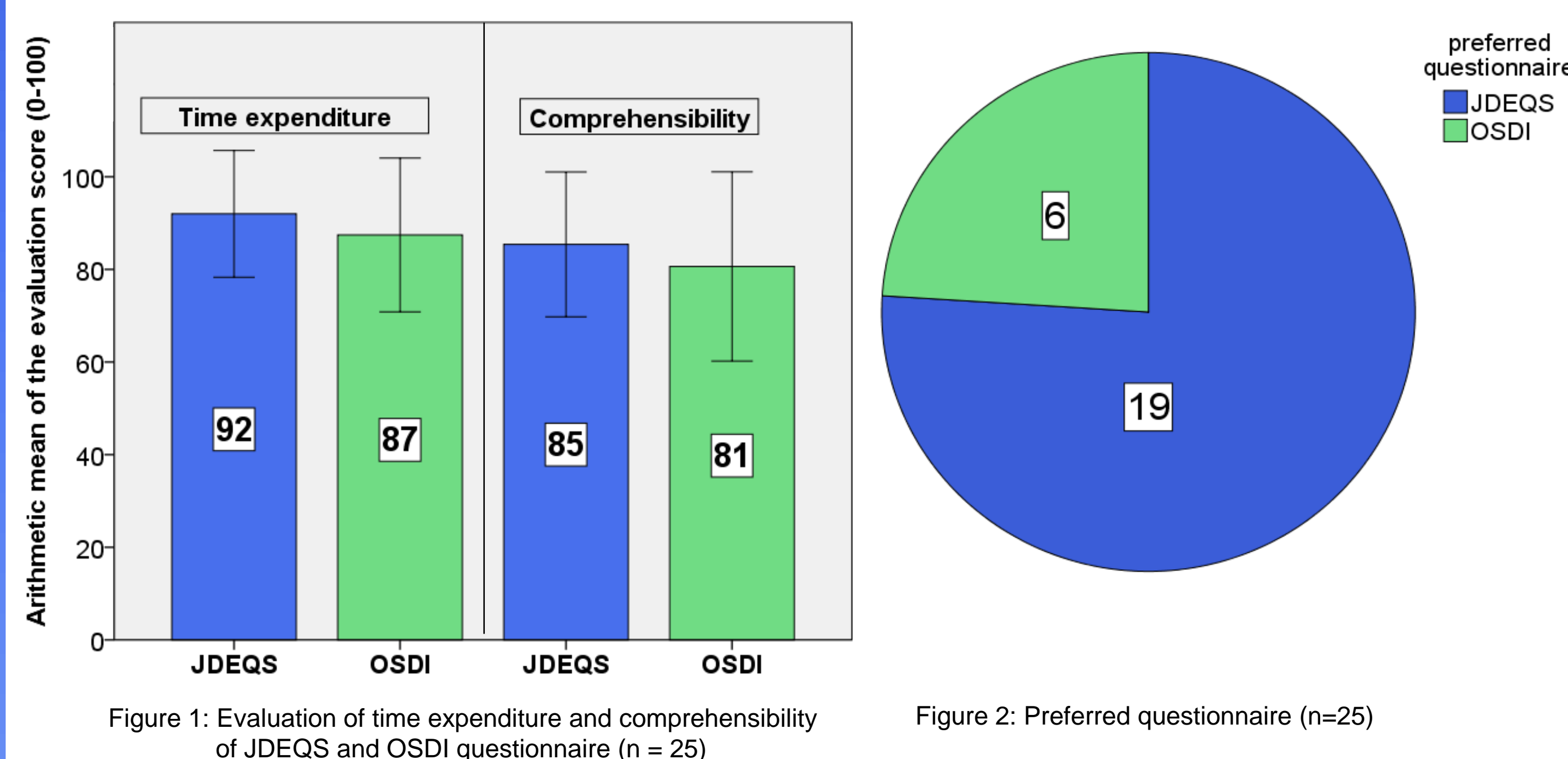
Primary Study:

- Prospective, multicenter and randomized cross-sectional study
- 120 subjects [57 male, 63 female, average age 31.9 years (SD = 10.8)]
- The subjects answered the questionnaires online or on paper
- The OSDI contains twelve questions related to ocular paresthesia, impairment of visual function, and the impact of environmental factors - "each in the last week" [6]
    - Ocular paresthesia include e.g. painful or sore eyes, blurred vision, eyes that feel gritty [6]
    - The impairment of visual function refers to e.g. to problems while reading, driving at night or working with a computer [6]
    - Questions about the influence of environmental functions are e.g. windy conditions or air conditioned rooms [6]

- The JDEQS is a screening questionnaire which contains three main questions regarding:

    - Symptoms such as pain/burning, dryness and blurred vision
    - Activities/environmental conditions in which the symptoms occur e.g. working with a computer, reading, driving, watching TV, wind
    - The use of eye drops due to dry eyes

- The JDEQS consists of dichotomous questions with yes/no

- For contact lens wearers additional questions are included which refer to:
    - Contact lens type, comfortable wearing time, time of day when symptoms develop and the use of eye drops

- The degree of agreement between OSDI and JDEQS classification was determined using Cohen's kappa coefficient (κ)

Results:

Pilot study:

- The two questionnaires differed by 4 to 5 points on a one hundred point scale in terms of expenditure of time (JDEQS 92 points/OSDI 87 points) and comprehensibility (JDEQS 85 points/OSDI 81 points) (Fig. 1)
- With regard to the preference, 19 out of 25 subjects would choose the JDEQS over the OSDI (Fig. 2)

Figure 1: Evaluation of time expenditure and comprehensibility of JDEQS and OSDI questionnaire (n = 25)

Figure 2: Preferred questionnaire (n=25)

Primary study:

- The results of OSDI and JDEQS without contact lens (CL) (k = 0.321) and with CL (k = 0.185) showed a weak agreement
- The agreement between JDEQS with CL and the OSDI questionnaire (k = 0.19) is also weak
- The "noticeable" findings of the DEQ's are not evenly distributed (Fig. 3)
- The JDEQS without CL classifies 39 subjects as "noticeable" whereas the OSDI questionnaire only detects 15 subjects as such (Fig. 3)
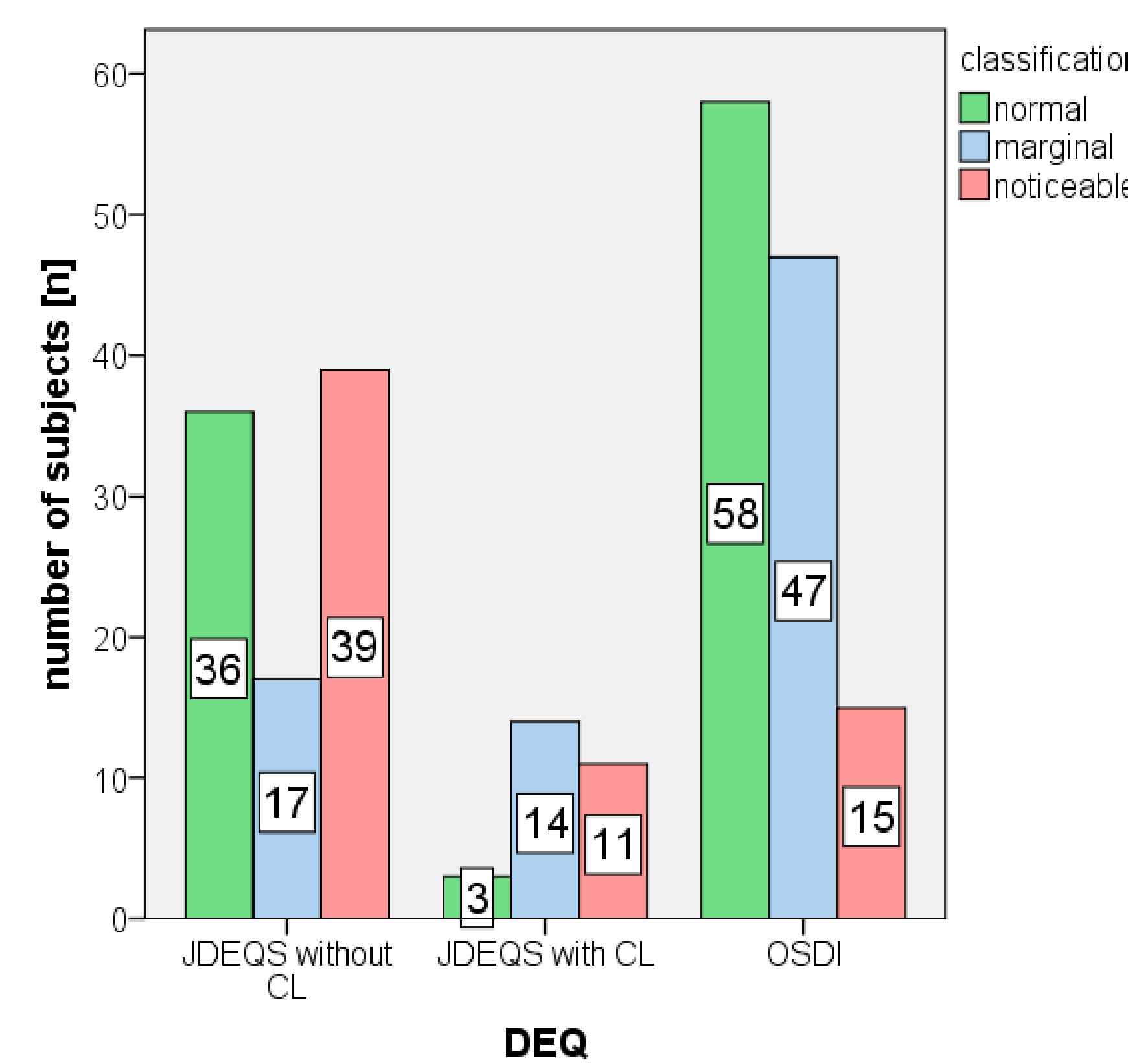

Figure 3: Classification of the individual DEQ's (n = 120)

Modification:

- The cut off values of the JDEQS were modified by 2 to 5 score points
- The modified JDEQS achieved a fair agreement with the OSDI concerning the questionnaire without CL (k = 0.476) as well as the one for CL-wearers (k = 0.427) (Tab. 1)

Table 1: Classification of JDEQS + modified cut off values

Category	JDEQS without CL		JDEQS with CL	
	Original cut off values	Modified cut off values	Original cut off values	Modified cut off values
normal	≤ 5	≤ 8	≤ 8	≤ 13
marginal	6 – 8	9 – 13	9 – 19	14 – 21
noticeable	≥ 9	≥ 14	≥ 20	≥ 22

- The modification of the noticeable findings was distributed almost equally (Fig. 4)
- The JDEQS without CL classifies 17 subjects as "noticeable" and the OSDI questionnaire 15 subjects (Fig. 4)
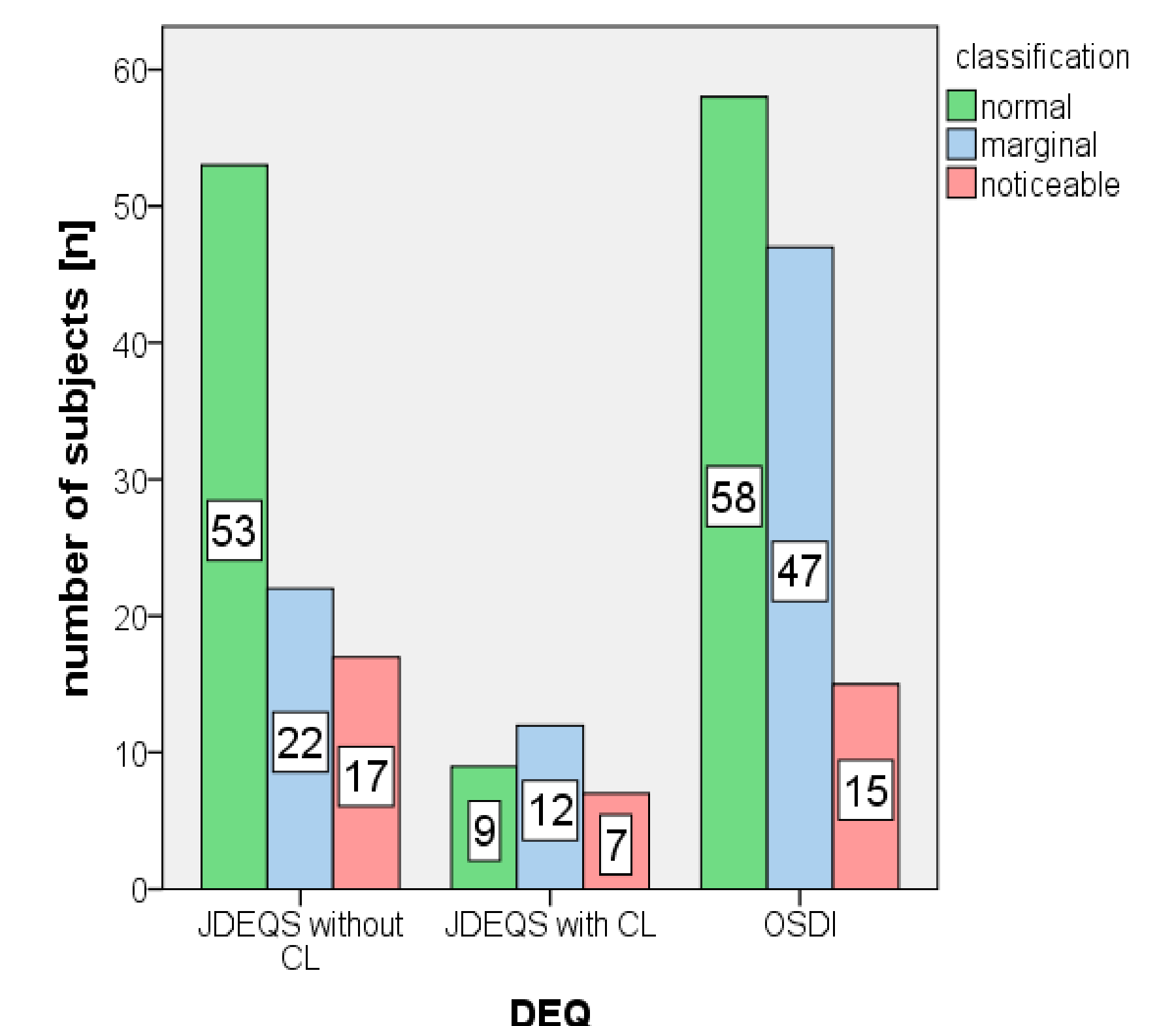

Figure 4: Modified classification of the individual DEQ's (n = 120)

Conclusion:

- The JDEQS is a current and comprehensible questionnaire that can be used to determine the dry eye
- After the modification of the JDEQS' cut off values it delivered comparable results to the established OSDI
- Due to its fast feasibility and easy comprehension the evaluation showed a clear preference for the JDEQS
    - This may contribute to increase the acceptance of dry eye questionnaires in the practice
- Nevertheless, additional objective diagnostic tests should be performed to determine the severity of dry eye symptoms

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