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Pre-operative psychiatric morbidity in people undergoing cataract surgery

Przedoperacyjna zachorowalność psychiatryczna u osób zakwalifikowanych do operacyjnego leczenia zaćmy

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Key words: depression, cognitive impairment, visual functioning

Słowa kluczowe: depresja, zaburzenia poznawcze, funkcjonowanie wzrokowe

Summary

Background. The aim of our research was to examine the impact of depressive symptomatology and cognitive impairment on visual function and symptoms in patients with cataract.

Material and methods. Demographic details, ophthalmological details, Snellen acuity, cataract symptoms, visual function, depressive symptomatology, cognitive impairment and quality of life were measured in 72 elderly subjects attending the pre-assessment cataract clinic at the Herts and Essex Hospital, Bishops Stortford, England.

Results. Subjects with depressive symptomatology were significantly more affected by symptoms of cataract (Spearman = 0.039, $p < 0.05$) and had poorer visual functioning (Spearman = 0.023, $p < 0.05$) than their non-depressed counterparts, despite no significant difference in visual acuity between the two groups. There were no significant differences for subjects with cognitive impairment and cataract symptoms (Spearman = 0.700, NS) or visual functioning (Spearman = 0.158, NS).

Conclusions. The study supports the hypothesis that depressive symptomatology is related to pre-operative cataract symptoms and visual functioning, but did not confirm that cognitive impairment was related to pre-operative cataract symptoms or level of visual function.

Streszczenie

Wstęp. Celem badań była ocena wpływu objawów depresji i zaburzeń poznawczych na funkcjonowanie wzrokowe oraz symptomatologię chorych z zaćmą.

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Materiał i metody. Dane demograficzne i okulistyczne, ostrość wzroku wg Snellena, objawy zaćmy, funkcjonowanie wzrokowe, symptomatologię depresji i zaburzeń poznawczych oraz jakość życia badano u 72 starszych pacjentów leczonych w przeddiagnostycznej Klinice Zaćmy przy Szpitalu Herts and Essex w Bishops Stortford, Anglia.

Wyniki. Osoby z objawami depresji w sposób statystycznie istotny bardziej odczuwały objawy zaćmy (Spearman = 0.039, $p < 0.05$) i wykazały niższy poziom funkcjonowania wzrokowego (Spearman = 0.023, $p < 0.05$) w porównaniu z pozostałymi badanymi bez oznaków depresji, pomimo braku istotnych różnic pod względem ostrości wzroku pomiędzy obydwoma grupami. Brak było statystycznie istotnych różnic w przypadku osób z zaburzeniami poznawczymi pod względem symptomatologii zaćmy (Spearman = 0.700, NS) oraz funkcjonowania wzrokowego (Spearman = 0.158, NS).

Wnioski. Uzyskane przez nas wyniki pozwalają stwierdzić, że objawy depresji korelują z przedoperacyjnymi objawami zaćmy oraz z obniżonym poziomem funkcjonowania wzrokowego. Nie potwierdza się hipotezy, że zaburzenia poznawcze korelują z przedoperacyjnymi objawami zaćmy oraz z obniżonym poziomem funkcjonowania wzrokowego.

Introduction

It is estimated that, by the age of 80 years, cataract affects nearly 100% of the general population, some 50% of people being affected by the age of 60 [1]. Cataract surgery is the commonest form of elective surgery in the UK, with approximately 200,000 cases performed each year and predicted to rise to 250,000 by 2003 [2]. Surgery is usually an effective and safe procedure with relatively few adverse effects [3]. High pre-operative functional expectations are justified with 89% of patients' expectations being met post-operatively [4].

Quality of life, depression and cognitive functioning in patients are increasingly seen as important measures of overall outcome, with more emphasis being placed on these factors than on improvement in visual acuity [5]. Depression is often associated with physical ill health, bereavement and underlying cerebral pathologies (e.g. Alzheimer's Disease). Prevalence varies with approximately 14% of the community geriatric population affected rising to 25% of hospitalised patients of the same age group [6].

Dementia affects 5-6% of the population over the age of 65 yrs. It has been well documented that amongst the physically ill older population, there is an increased prevalence of depression, compared with age matched norms or younger people with physical illness or in the general population. This may be particularly important since the coexistence of depression and physical illness has been shown to worsen the prognosis of both [6].

Amongst patients being treated for visual impairment, quality of life normally improves alongside visual function [7]. As visual acuity improves, levels of depression and tension decrease [8], and quality of self-image increases [9]. Of patients electing to undergo cataract extraction, the strongest predictors of a good outcome in terms of visual function are a lower age, absence of any ocular comorbidity, a high cataract symptom score and a low VF-14 score [10]. The evidence that an analogous improvement occurs in quality of life is mixed. Despite an improvement in visual function, only 36% of subjects in one study reported an increase in their quality of life [11], but the improvement is maintained for at least one year post-operatively [12].

Patients with decreased cognitive functioning and a poorer score on the activities of daily living scale are less likely to elect to have cataract surgery [12]. The presence of depression does not have such an influence on their decision to elect for surgery [12] but is unlikely to be affected by the procedure [13].

Psychiatric morbidity can be a good predictor of outcome in general medical procedures [6], with post-operative complications being closely associated with depression [14]. Amongst patients atten-

ding Accident and Emergency both those with depression and those with cognitive impairment tended to have longer stays in hospital as in-patients [14].

In conclusion, whilst the benefits of cataract surgery are evident in terms of an improvement in visual acuity, a review of the literature would suggest that patient satisfaction in terms of psychiatric morbidity would warrant further investigation.

Aims and Hypotheses

This paper presents baseline findings from a prospective cohort study examining the effects of depressive symptoms and cognitive impairment on visual function prior to cataract surgery. The specific hypotheses tested at baseline (and reported in this paper) were:

1. Pre-operative symptoms of cataract and level of visual function is related to depressive symptoms
2. Pre-operative symptoms of cataract and level of visual function is related to cognitive impairment

Methods

The study was performed at the Herts and Essex Hospital, which serves a local district general hospital function for West Essex and East Hertfordshire. Ethical approval was granted by West Essex Local Research Ethics Committee. All patients aged 60 years or over attending for routine cataract surgery over an 8 week period between February 2002 and April 2002 were written to in advance and asked if they were prepared to participate in a study examining whether there was any relationship between mood or memory function and cataract surgery. Patients able and willing to give informed consent to the study were interviewed by PD and RK using a short structured interview prior to surgery.

The following data were collected for analysis:

1. Demographic details:
 - a. Gender
 - b. Age
 - c. Marital status
 - d. Years in education
2. Chronology details:
 - a. Year of onset
 - b. Speed of referral
3. Ophthalmological details:
 - a. Eye for surgery
 - b. Visual acuities pre and post-operatively
4. Pre-operative visual function using the Cataract Symptom Scale
5. Pre-operative visual function (VF) using the Visual Function Questionnaire (VF-14)
6. Pre-operative depression using the 15-Item Geriatric Depression Scale (GDS15)
7. Pre-operative cognitive impairment using the Mini Mental State Examination (MMSE)
8. Pre-operative quality of life using the 12-Item Health Status Questionnaire (HSQ-12)

Items 1-3 were collected using a demographics sheet with ophthalmological details being recorded from the patient medical records. Visual acuity was recorded using a Snellen chart, and graded according to acuity level. Patients were assessed when they arrived for surgery, using structured and semi-structured interviews (No's 4-8) as listed above.

Exclusion Criteria

1. All patients unable or unwilling to give informed consent.
2. All patients aged <60 years of age.
3. All patients undergoing corrective surgery for complications that arose during previous cataract surgery.
4. All patients with severe dementia (MMSE<18).

Analysis of data

Data were analysed initially using univariate analyses (Spearman correlations, chi-squared test or Mann Whitney 'U' test as appropriate). Calculations were done using the Statistical Package for Social Sciences (SPSS).

Results

The Sample

Seventy two patients completed the pre-assessment interview prior to being listed for elective cataract surgery. Their demographic details are summarised in Table 1.

Table 2 Summarises the patients' psychiatric morbidity pre-operatively. 18.6% (13/70) were 'cases' of depression and 24.3% (17/70) had mild cognitive impairment. 8.8% (6/68) had both significant depressive symptomatology and cognitive impairment.

Hypotheses

1. Cataract Symptom Scale (CSS)

CSS scores range from a possible 0 indicating no cataract symptoms to 15 for very bothersome symptoms. In this sample, scores ranged from 0 – 14 with a mean score of 3.74 (s.d. = 3.04). Each individual symptom was rated on a score 0 (not present) to 3 (very 'bothersome'). The most 'bother-

Tab. 1. Demographic and ocular characteristics of pre-op sample

Tab. 1. Charakterystyka demograficzna i okulistyczna próbki pacjentów przed operacją

Characteristic	Pre-op sample
N	72
Gender (F/M)	46/25 (1 missing value)
Mean age (range)	77.10 +/- 6.531 (60 - 92)
Ocular comorbidity:	
Diabetic eye disease	4 (6.0%)
Glaucoma	7 (10.4%)
ARMD	11 (16.4%)
Other	23 (31.9%)
CSS	
Mean CSS (range)	3.74 +/- 3.04 (0 - 14)
VF-14	
Mean VF-14 (% range)	80.75 +/- 20.011 (21.43 - 100)

CSS = Cataract Symptom Scale, 0 = asymptomatic, 15 = extremely bothered by all symptoms

VF-14 = 14-item Visual Function Scale, 0 = poor visual function, 100 = perfect visual function

some' symptom was blurry vision (mean score=1.21, s.d.=1.091) whilst the least troublesome symptom was colours looking different (mean score=0.43, s.d.=0.917).

Tab. 2. Psychiatric morbidity

Tab. 2. Zachorowalność psychiatryczna

Characteristic	Pre-op sample
N	70 (2 missing values)
GDS15	
Mean GDS15 (range)	2.89 +/- 2.602 (0 - 11)
% GDS15 cases	18.6
MMSE	
Mean MMSE (range)	26.17 +/- 2.823 (20 - 30)
% Not demented	75.7
% Mildly demented	24.3

GDS15 = 15-item Geriatric Depression Scale, Scores >5 indicate probable depression

MMSE = Mini Mental State Examination, 25-30=not demented, 18-24=mildly demented

Subjects who scored as 'depressed' on the Geriatric Depression Scale scored significantly higher on the Cataract Symptom Scale (Spearman=0.039, $p<0.05$) with a mean score of 6.31 (s.d.=4.516) compared with 3.25 (s.d.=2.293) for their 'non depressed' counterparts (see Figure 1).

Patients with depressive symptoms had a higher mean score for all individual symptoms of cataract than 'non depressed' patients. This was significant for symptoms of 'distorted vision' (Mann Whitney=0.040), 'glare' (Mann Whitney=0.023) and 'worsening of vision' (Mann Whitney=0.027).

There were no significant differences between mean CSS score and cognitive impairment (Spearman=0.700; NS) nor for individual symptoms of the CSS and cognitive impairment: distorted vision.

The CSS was shown to correlate with the VF-14 (Spearman=0.003, $p<0.01$). Likewise, visual acuity of the eye for surgery correlated significantly with the CSS (Spearman=0.026, $p<0.05$) but not with the VF-14 (Spearman=0.964, NS).

2. Visual Function Scale (VF-14)

VF-14 total scores can range from 0 (very poor visual function) to 100 (perfect visual function). Amongst the subject group, scores ranged from 21.43 to 100, with a mean score of 80.75 (s.d.=20.01).

Subjects who scored as 'depressed' on the Geriatric Depression Scale scored significantly lower on the Visual Function Scale (Spearman=0.023; $p<0.05$) with a mean score of 63.26 (s.d.=27.81) compared with 84.1071 (s.d.=16.28) for their 'non depressed' counterparts (see Figure 2).

Significant correlations were shown between 'reading small print' (Spearman=0.004; $p<0.01$), 'reading books' (Spearman=0.035; $p<0.05$), 'close work' (Spearman=0.048, $p<0.05$), and total VF-14 score (Spearman=0.023; $p<0.05$) with depression.

Subjects who were classified as 'mildly demented' by the Mini Mental State Examination had a mean score of 75.11, s.d.=25.31), and those who were 'not demented' had a mean score of 83.67, s.d.=16.01). This difference was not statistically significant, (Spearman significance=0.158; NS).

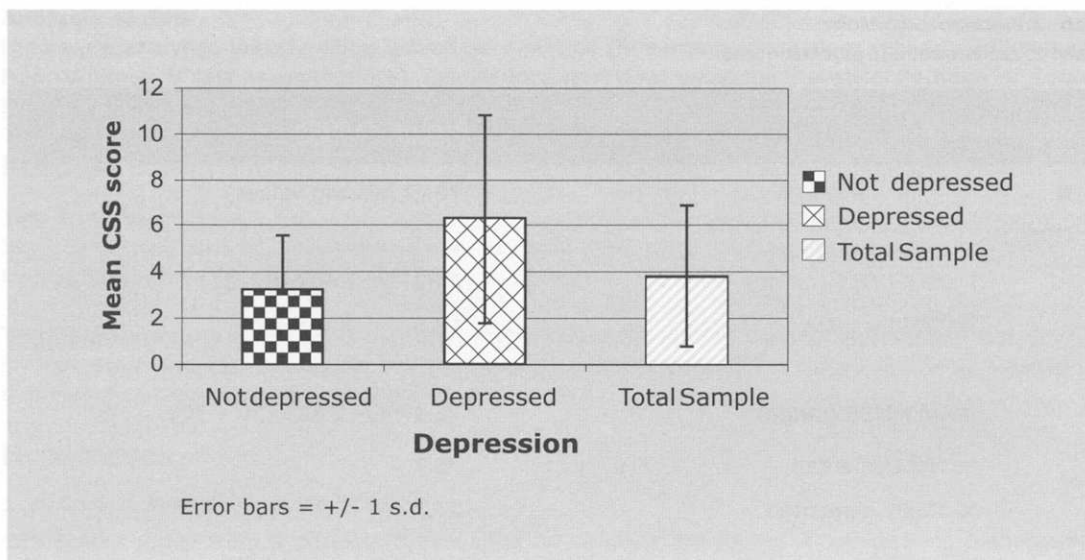


Fig. 1. Mean CSS score vs. depressive symptoms (N = 70)

Ryc. 1. Średnia ocena CSS w stosunku do objawów depresji (N = 70)

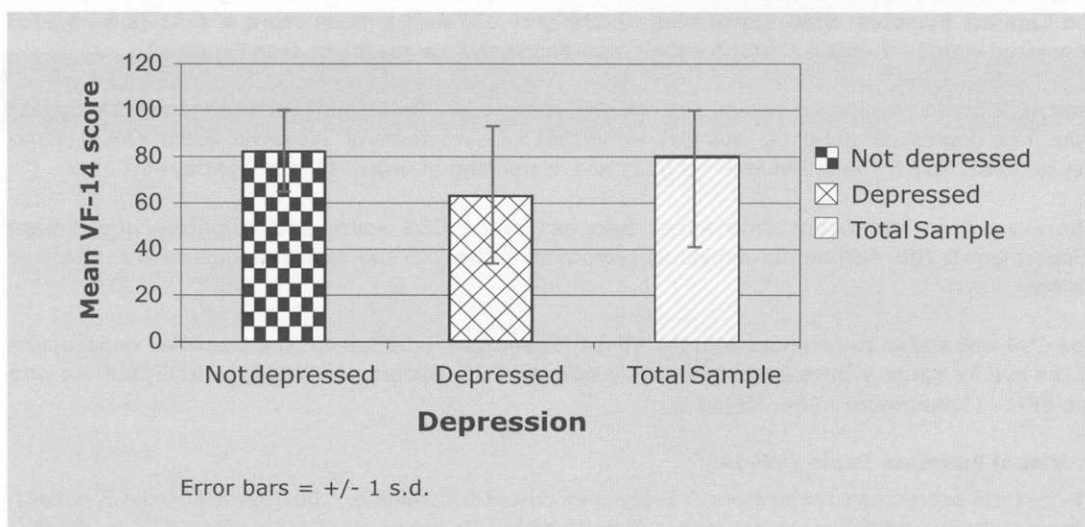


Fig. 2. Mean VF-14 score vs. depressive symptoms (N = 69)

Ryc. 2. Średnia ocena VF-14 w stosunku do objawów depresji (N = 69)

'Mildly demented' patients had a significantly lower mean score for the cooking than patients with no cognitive impairment (Spearman significance=0.004; $p < 0.01$).

3. Visual Acuity (VA)

Visual acuity was measured using a standard Snellen letter chart for 72 patients. The VAs of each patient were then categorised into standards of vision. The categories used were:

1. 6/4 → 6/6 = Excellent
2. 6/9 → 6/12 = Good
3. 6/18 → 6/24 = Moderate
4. 6/36 → 6/60 = Poor
5. 3/60 → Light Perception Only (LPO) = Very Poor

There was no relationship between depressive symptomatology and visual acuity (Spearman=0.082, NS) nor between cognitive impairment and visual acuity (Spearman=0.656; NS).

Subjects with worse visual acuity in the eye for surgery scored significantly worse on the CSS (Spearman=0.026, $p < 0.05$) although there was no significant difference with the VF-14 (Spearman=0.964, NS).

Subjects were categorised according to whether or not they had any pre-existing ocular comorbidity including the presence of diabetic retinopathy, age-related macula degeneration (AMD) or glaucoma. There were no significant differences between the two groups for depressive symptomatology, CSS scores, VF-14 scores or cognitive impairment.

4. Health Status Questionnaire (HSQ12)

Seventy two subjects completed the Health Status Questionnaire (HSQ12) pre-operatively. Scores ranged from 0–100 for each domain. The mean scores for each of the domains is as follows: Health perception (mean=55.14; s.d.=30.152), Physical Functioning (mean=57.9813; s.d.=39.22409), Role – Physical (mean=65.14, s.d.=37.673), Role – Mental (mean=88.68, s.d.=23.286), Social Functioning (mean score=89.93, s.d.=22.851), Bodily Pain (mean=68.47, s.d.=29.760), Mental Health (mean=73.9647, s.d.=21.95519) and Energy (mean=47.27, s.d.=32.275).

There were no significant differences for the individual HSQ12 domains and first or second eye surgery.

Subjects who scored as 'depressed' on the Geriatric Depression Scale scored significantly lower for all the domains of the Health Status Questionnaire (see Figure 4). The Spearman correlations for each of the domains is as follows: Health perception (Spearman significance=0.000; $p < 0.01$), Physical Functioning (Spearman significance=0.000; $p < 0.01$), Role – Physical (Spearman significance=0.000; $p < 0.01$), Role – Mental (Spearman significance=0.002; $p < 0.01$), Social Functioning (Spearman significance=0.000; $p < 0.01$), Bodily Pain (Spearman significance=0.007; $p < 0.01$), Mental Health (Spearman significance = 0.000; $p < 0.01$) and Energy (Spearman significance = 0.000; $p < 0.01$). There were no significant differences for any of the Health Status Questionnaire domains between those subjects who were classed as 'mildly demented' by the Mini Mental State Examination and those with no cognitive impairment.

Discussion

This is the first study to examine both depressive symptomatology and cognitive impairment in patients undergoing cataract surgery. Our main finding is that depressive symptoms were associated with visual functioning but that no such associations were apparent between cognitive impairment and visual measures. Depressive symptoms were also associated with general systemic well being.

The population we studied appears to be representative of patients undergoing cataract surgery. The mean age of subjects was 77.10 years (s.d. = 6.531), 63.9% were female and 36.1% were male. 43.1% were undergoing second eye cataract surgery. This is in keeping with the findings of the European Cataract Outcome Group [16].

In our sample, 18.6% of patients were rated as having depressive symptomatology. These levels of psychiatric morbidity were similar to those found in other hospital samples for groups of a similar age [17]. 27% of patients aged 65 years and over admitted to hospital via an Accident and Emergency (A & E) department were rated as depressed by the Brief Assessment Schedule (BAS) but only 18.1%

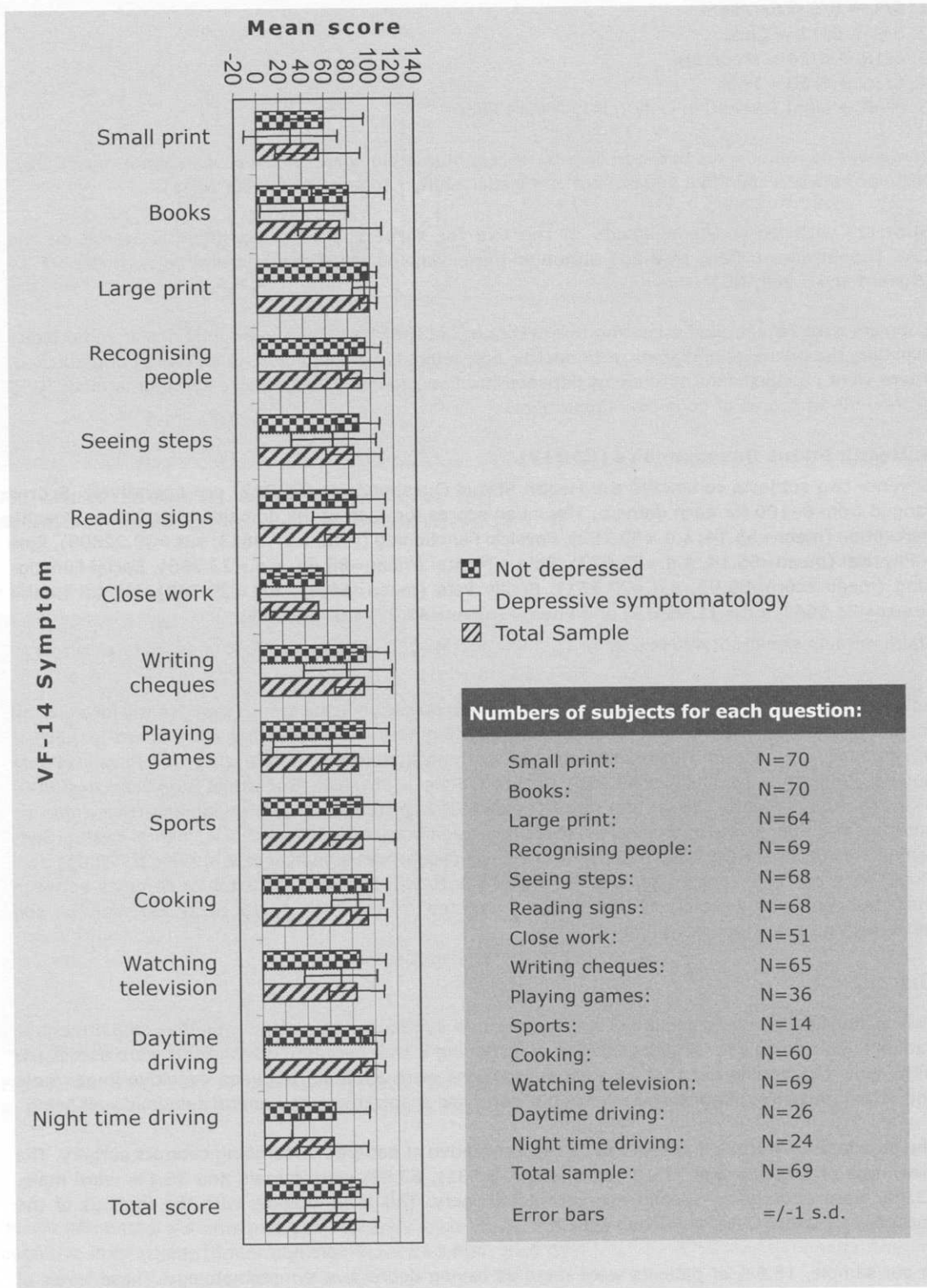


Fig. 3. Individual Visual Function (VF-14) symptoms vs. depressive symptomatology

Ryc. 3. Poszczególne objawy w zakresie funkcjonowania wzrokowego (VF-14) w stosunku do symptomatologii depresji

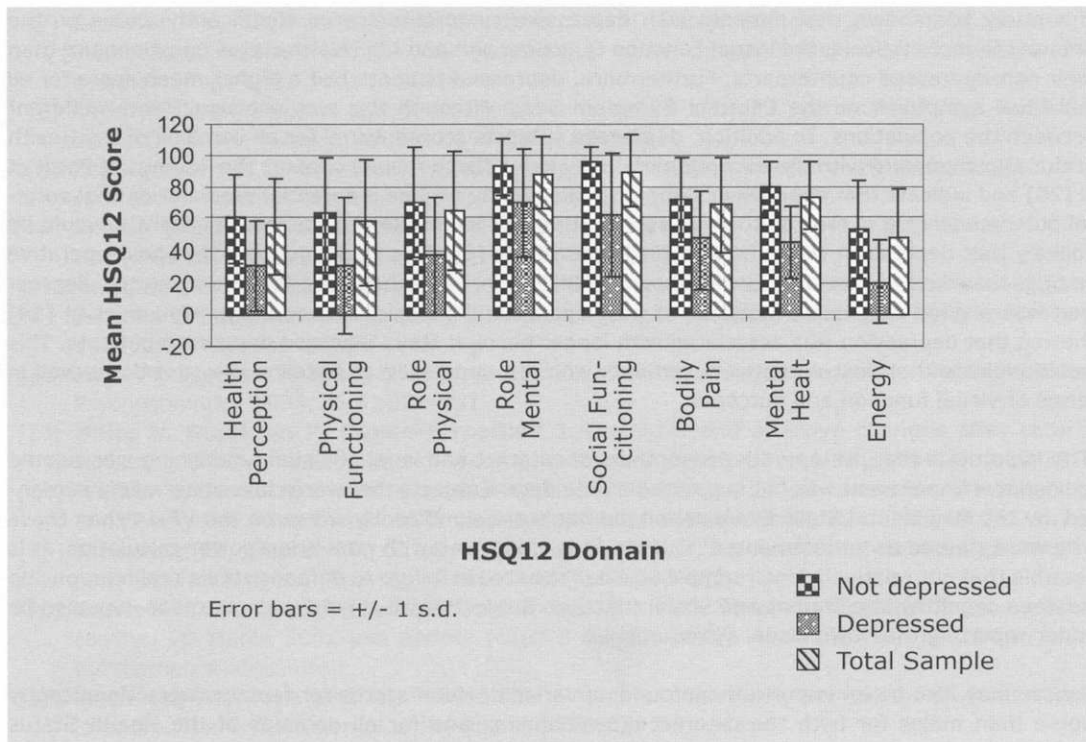


Fig. 4. Mean HSQ12 score for individual domains vs. depression (N = 66-72)

Ryc. 4. Średnia ocena HSQ12 dla poszczególnych domen w stosunku do depresji (N = 66-72)

were classified as 'depressed' by the Geriatric Depression Scale [14]. Whilst the results in this study are slightly higher than would be expected in a community geriatric population (approximately 15%) [6], it is in keeping with the rate of depression found in hospital inpatients [14] and slightly lower than the percentage of patients attending their general practitioners [18]. In this sample population, 34% of those over 65 years scored above the GDS15 cut-off (4/5) for significant depressive symptomatology [18].

23.6% of patients in our study were mildly demented, compared with 16.67% of elderly patients attending A & E [14]. Both of these findings are higher than the expected prevalence of 5-6% in the normal population over 65 years of age (Manela et al, 1996)¹⁹.

Scores on the CSS range from 0 (no symptoms) – 15 (extremely bothered by all symptoms) with a mean score of 5.2 +/- 3.8 [20]. The results of this study were compatible with these findings with a mean score of 3.74 +/- 3.04. Similarly, scores on the VF-14 range from 0 (unable to do a task because of poor visual function) to 100 (perfect vision) with a mean score of 75.5 (s.d.=16.6)[20]. The results of this study were similar to these findings with a mean score of 80.75 (s.d.=20.011).

Desai et al [5] showed that VA in the better eye correlated significantly with the VF-14. In this study, there was a correlation between visual acuity in the eye for surgery and symptoms on the Cataract Symptom Scale though not for the Visual Function Questionnaire.

Not surprisingly, the Visual Function Questionnaire (VF-14) showed that patients complained more of problems associated with detailed work than for tasks such as reading large print.

This study has shown that patients with depressive symptoms scored significantly worse on the Cataract Symptom Scale, the Visual Function Questionnaire and the Health status questionnaire than their non-depressed counterparts. Furthermore, depressed patients had a higher mean score for all individual symptoms on the Cataract Symptom Scale although this was not significantly different between the populations. In addition, depressed subjects scored worse for all domains of the Health Status Questionnaire with the exception of Bodily Pain. These results support the findings of Pettit et al [20] and indicate that depressive symptomatology may well be a potential predictor of final surgical outcome since it is clear that 'depressed' patients score worse at baseline. Clinically, it would be unlikely that depression would resolve post-operatively [6]. This would suggest that post-operative findings may well endorse the results shown by Billig et al [13] who found that pre-operative depression was a good diagnostic indicator of post-operative depression. In addition, Walker et al [14] showed that depression was associated with longer hospital stays than non depressed patients. This would indicate that post-operatively, patients who are depressed at baseline may not do as well in terms of visual function and outcome.

The hypothesis that pre-operative symptoms of cataract and level of visual functioning was related to cognitive impairment was not supported by the data. Subjects that were classed as 'mildly demented' by the Mini Mental State Examination did not score significantly worse on the VF-14 than those who were classed as 'not demented'. Our study is a pilot one with no a priori power calculation. It is possible that our relatively small sample size has resulted in failure to demonstrate a real relationship between cognitive impairment and visual function. Subjects with cognitive impairment may also be under-reporting their own visual symptoms.

Gender may also be an important confounding variable. Mean scores for females were significantly worse than males for both the cataract questionnaires and for all domains of the Health Status Questionnaire.

Depression is both a common and a treatable illness. This study suggests that depression may be an important determinant of the degree of disability caused by cataract. We hope in a forthcoming paper to explore the predictive effect of psychiatric symptoms on post-operative outcome.

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