

# Effects of Covid-19 On Mental Health of Patients Awaiting Elective Degenerative Spine Surgery in The UK

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## Abstract

**Introduction:** Novel Coronavirus (COVID-19) outbreak in early 2020 has led to significant changes to the waiting list for elective spine surgery. Patients in the National Health Service (NHS) had to wait longer with increasing uncertainty on when and if they will have their surgery undertaken. This apprehension has possibly led to increased stress and mental health issues amongst patients waiting for elective spine surgery in the UK. Our aim is to determine if patients were depressed whilst waiting longer for their spine surgery during the pandemic.

**Methods:** Elective spine patients booked before the outbreak of COVID-19 were included. Patients with pathologies other than degenerative spine diseases were excluded, as were spine injections. Validated depression screening score-patient health questionnaire 2 (PHQ2) was used to screen patients for depression before and after the outbreak. Oswestry disability scores (ODI) were calculated prospectively.

**Results:** 42 patients were included M: F=24:18. Mean age was 62.57 years. There were no significant differences between age and PHQ2 (P=0.89); sex and depression (Fischer exact test=1; P>0.05); ODI (P=0.41) and type of procedure (decompression, two level-decompression, fusion and disc surgery; p= 0.05) when related to diagnosis of depression. However, the PHQ2 was significantly in favour of depression (score >3) in 71.4% patients compared to the pre- COVID-19 outbreak (Fisher exact test=0.02; p<0.05)

**Conclusion:** This study reports the mental health effects on patients awaiting elective spine surgery in the NHS secondary to delays and uncertainties surrounding elective surgery services related to outbreak of COVID-19 patients.

**Keywords:** Spine; depression; COVID19; waiting time

## Introduction

Since the start of the Novel Coronavirus (COVID-19) pandemic in early 2020, the elective spine surgery practice has been affected dramatically. During the 12 week peak of the first COVID-19 surge, it was projected that 28,404,603 elective cases were cancelled globally [1]. Around 4.5 million people are still awaiting elective surgery in the UK, which means a massive escalation in the waiting list in the National Health Service (NHS) [2]. To reduce avoidable exposure of patients and health-care workers, and divert resources to COVID-19 management, most elective work was stopped throughout the UK by April 2020.

High degree of uncertainty due to frequent disruption of the elective work throughout the pandemic created more stress and possible mental health implications for patients. In some spinal centers, it is noted that delays can have high morbidity

burdens with further robust evidence that delaying spine surgery will have a negative impact on patient outcomes [3,4]. Recently, a UK-based study completed by Scott et al revealed the impact of delaying arthroplasty surgeries in the UK on the quality of life of these patients, some of them described as “worse than death” (WTD) in up to fifth of their prospective hip arthroplasties and just over a tenth in their knee arthroplasties [5]. Clement *et al.* further qualified this within the context of the COVID-19 pandemic by stating that up to a third of total hip arthroplasties and nearly a quarter of knee arthroplasties were nearing this WTD state [6].

We reviewed the possible impact of prolonged waiting list time for prospective spine surgery on the mental health of the waiting patients. The aim of our study is to do a survey and detect the impact of cancellation of elective spine surgery in the patients' mental health.

## Methods

A cross-sectional, observational study was conducted at a district general hospital in the UK. The study looked at forty two patients on the NHS-funded elective waiting lists for spine surgery. They were all booked over a six-month period before the first outbreak of COVID-19 prior to March 2020.

A quality improvement project was registered in our institution via the Audit Management and Tracking (AMAT) online system. Clinical notes of the 42 patients were requested to review the clinic letters and the pre- COVID-19 Oswestry Disability Index (ODI) and Patient Health Questionnaire-2 (PHQ2) scores. Diagnoses and the procedures for which the patients were listed were obtained from the clinic letters and the MRI scans reports. Upon receipt of ethical approval from the local information governance team, the patients were contacted via telephone to fill in the PHQ2 and ODI questionnaires during the period following the first peak of COVID-19.

Patients with other comorbidities other than degenerative spine diseases (including spinal tumour, pathological fractures or spinal deformities) and spinal injections were excluded from this study, as these cases need to be managed on an urgent basis.

The PHQ2 depression scoring tool was used to screen the cohort of patients for depression before and after the COVID-19 outbreak in this study. PHQ2 is a two-tiered screening tool for clinical depression; it quantifies low mood and anhedonia for up to two weeks prior to onset of questionnaire. Each tier can be scored from 0 – 3; a score of 0 stated the prevalence of symptoms in patients' life subjectively to 'not at all' whereas 3 stated symptoms were nearly every day. Total score varies from 0 to 6. If the score is 3 or greater, elevated symptoms of depression are likely [7].

**Table 1:** A table depicting the PHQ2 scoring screening tool [7].

	Not at all	Several days	More than half the days	Nearly every day
Lost interest or had little pleasure in doing little things - anhedonia	0	1	2	3
Depressed, low mood, helplessness	0	1	2	3

The Oswestry Disability Index (ODI) (also known as the Oswestry Low Back Pain Disability Questionnaire) is the 'gold standard' for assessment of the functional outcome of low back problems [9]. Oswestry disability scores (ODI) were calculated prospectively for the same set of patients before and after the first COVID-19 outbreak. The ODI questionnaire is composed of 10 sections; each has 6 options which are scored from 0 to 5. And based on the total score, the degree of disability is identified and a plan of action is suggested, as shown in table 2.

**Table 2:** The Oswestry Disability Index (ODI)

Score(%) and level of Disability	Functional Outcome
0% to 20%: minimal disability	The patient can cope with most living activities. Usually no treatment is indicated apart from advice on lifting, sitting and exercise.
21%-40%: moderate disability	The patient experiences more pain and difficulty with sitting, lifting and standing. Travel and social life are more difficult and they may be disabled from work. Personal care, sexual activity and sleeping are not grossly affected and the patient can usually be managed by conservative means.
41%-60%: severe disability	Pain remains the main problem in this group but activities of daily living are affected. These patients require a detailed investigation.
61%-80%: crippled	Back pain impinges on all aspects of the patient's life. Positive intervention is required
81%-100%	These patients are either bed-bound or exaggerating their symptoms.

### Statistical analysis:

The goal of the statistical analysis in our study is to identify the factors that led to mental health disorder (major depression) in our cohort of patients. The correlation between patients' demographics (age and sex), type of procedure and the COVID-19 outbreak during the first peak was analysed. Additionally, the ODI was also used to compare the disability level affecting the patients before and after March 2020.

Dichotomous variables (sex, pre and post COVID-19 PHQ2 outcome) were analysed using a Fisher's exact test for the between group comparisons. Non-parametric tests (Man Whitney and Spearman's Rho) were used to assess the likelihood of depression in relation to the age and type of procedure for which the patients were listed and also used to compare ODI pre and post COVID-19. A p-value < 0.05 was defined as statistically significant.

## Results

Patients' demographics are included in the tables (3&4). Twenty four male patients were reviewed in contrast to 18 females with degenerative spine disease. Mean age was 62.57 years.

**Table 3:** Table showing the age characteristics of involved patients

N=42	Age (in years)
Range	56 - 73
Mean	62.57

**Table 4:** Table showing the sex ratio

Sex	Number of patients (n=42)
Male	24
Female	18

There were no significant differences between age and PHQ2 ( $P=0.89$ ); sex and depression (Fischer exact test=1;  $P>0.05$ ); ODI ( $P=0.41$ ) and type of procedure (decompression, two-level decompression, fusion and disc surgery;  $p=0.05$ ) when related to diagnosis of depression. List of the procedures are included in table (4).

However, the PHQ2 was significantly in favour of depression (score  $>3$ ) in 71.4% patients compared to the pre COVID-19 outbreak (Fisher exact test=0.02;  $p<0.05$ ).

**Table 5:** Relationship between the spinal procedure patients waiting for and depression score

Procedure	No. of patients	P value (Man Whitney)
Decompression	21	0.34
Two level decompression	9	0.10
Fusion	9	0.10
Discectomy	3	0.34

## Discussion

In our study, ten patients (71%) were found to have depression during the COVID-19 pandemic, four of them were already complaining of either low mood or anhedonia at least more than half of the days in the two weeks preceding the phone consultation. This reflects the effect of delayed spinal surgery in addition to the spine disease burden itself. Although there was no significant relation between the type of procedure and the diagnosis of depression, there was a direct correlation with the pandemic situation itself. This was proved subjectively by the patients' response to the PHQ-2 questionnaire.

Clement *et al* [6] showed that patients waiting for hip and knee replacement during the COVID-19 pandemic had a significantly worse quality of life than expected relative to the Covid COVID-19 -free years. Our study analysed the effect of the pandemic on the patients awaiting their elective spinal procedures as well. Another study reports, one spine patient out of one-hundred and eleven patients was included in a recent study that showed that 79% of the cohort had lower quality of life due to the delay between primary care referral and their outpatient clinic appointment [10].

The peripheral nature of our hospital serving a small rural community explains the small cohort of patients in our study. This is one of the limitations of the study. Also, using the PHQ-2 as the only tool of depression screening was another pitfall. In that context, previous literature proved that the PHQ-2 is a simple and reliable tool for screening of depression as in Kelvin K F Tsoi *et al* systematic review and meta-analysis. They showed that the test sensitivity and specificity were 91.8% and 67.7%, respectively [11]. PHQ-9 is more specific than the PHQ-2 at 91 to 94% [12]. It is used to confirm the diagnosis of major depression if identified on the PHQ-2 [13]. Depression can be one of the results of the COVID-19 restrictions which have been applied to the UK population during the time of the study. Therefore, a sample of people who are not on the waiting list for any surgical procedure might be depressed. It is a limitation that we did not include them in our study. We however, instructed each

patient to respond based on their experience of waiting for spinal surgery whilst the survey was done. Furthermore, all patients included in our study does have established spinal pathology amicable to surgical solution and hence the chances of significant depression not related to spinal pain is less likely to influence the outcome of their response.

At the start of the COVID-19 pandemic all non-urgent operating within the NHS was stopped. Trauma and orthopaedics were reduced to just 3.3% of normal operating volumes in England, the lowest percentage of any surgical speciality [14]. Although restarting the elective orthopaedic procedure was challenging during the COVID-19 time [15], it was found by Zahra *et al* that the elective surgery could be safely restarted while COVID-19 is still present in the society if there is an appropriate infrastructure, collaboration between NHS and private hospitals, appropriate governance arrangements, preoperative screening, testing and patient selection [16].

## Conclusion

Waiting time for elective surgery has always been a burden on the patients with regard to the physical and psychological aspects. The COVID-19 pandemic had a serious effect on the flow of delivery of care to the patients. This study reports the mental health effects on patients awaiting elective spine surgery in the NHS secondary to delays and uncertainties surrounding elective surgery services related to the outbreak of COVID-19 patients.

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