


Assessing the Attitudes, Awareness, and Behavioral Alterations of Patients Awaiting Total Hip Arthroplasty During the COVID-19 Crisis

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Abstract

Background: COVID-19 has placed a huge burden on healthcare systems which has led to widespread cancellation elective surgical care. Ireland is recovering from the first wave of COVID-19 and as such the expeditious return of elective surgical care is important. This is the first study to examine the attitudes of patients to undergoing total joint arthroplasty during the COVID-19 crisis. **Methods:** A prospective qualitative study was undertaken in our institution during the week 13/05/2020-20/05/2020. 65 patients completed a questionnaire assessing attitudes, awareness, and behavioral changes associated with COVID-19, a Charlson Comorbidity Index, modified-Harris Hip Score, and a Short Form-12 score. **Results:** 86% of patients felt that they were at little to no risk of COVID-19 infection. The majority of patients were happy to proceed with surgery at the current level of COVID-19 related threat (86%). Patients with higher mHHS were more likely to postpone their operation than those with lower mHHS scores. Our cohort had low patient reported outcome measures in both mHHS and SF-12, indicating the significant burden of hip osteoarthritis on both physical and mental health. **Conclusion:** Patients reported a significant disease-related impairment of physical function and subsequent deterioration in mental health as a result of hip osteoarthritis. Patients with worse hip function, as measured by the mHHS are more willing to proceed with surgery than those with superior hip function. This offers a potential mechanism by which to triage patients once elective surgical pathways reopen in the coming months.

Keywords

arthroplasty, coronavirus, COVID-19, elective surgery, public health

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Introduction

At the time of writing Coronavirus (COVID-19) has caused more than 750 000 deaths worldwide, placing a huge burden on to healthcare systems.¹

On March 27th 2020, the Irish government commenced a national lockdown in an attempt to “flatten the curve.”

Elective surgical care was cancelled in an attempt to alleviate capacity concerns and also to decrease the risk of infection to both healthcare workers and patients.² This hiatus from delivery of elective surgical care has seen significant increases in waiting lists for life-changing surgeries, such as Total Hip Arthroplasty (THA). The impact of the postponement of elective surgical care will have a lasting impact on our patients for years to come.

In Europe, the profound impact of COVID-19 restrictions on delivery of elective surgical care was illustrated by a recent survey conducted on members of the European Hip Society and the European Knee Association. 90% of respondents reported that their institutions had cancelled all arthroplasty services owing to COVID-19 restrictions.³ In the United States, it is estimated that approximately 30 000 primary hip

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arthroplasty procedures will be cancelled every week while COVID-19 restrictions remain in place.⁴ The timely resumption of elective surgical care is a matter of urgency owing to the significant morbidity associated with diseases like hip and knee osteoarthritis. Guidelines pertaining to the resumption of elective surgical care have already been published in the UK by both BOA and the Royal College of Surgeons England.^{5,6}

Prior to resumption of any elective surgery it is vital to assess the attitudes, awareness, and behaviors of the key stakeholders, the patients. Research in both the European and American context has shown that in spite of the ongoing pandemic the majority of patients are keen to undergo arthroplasty surgery as soon as possible.^{7,8} Naturally, some patients will have been daunted by the shocking images published in print media and reported in the news depicting extremely ill patients in overrun hospitals. We hypothesized that this may lessen their desire to undergo a hip replacement in the current climate.

The aim of this study therefore was to;

- a) Examine patient's willingness to proceed with Total Hip arthroplasty during the COVID 19 pandemic.
- b) Examine patient's attitudes, awareness, and behaviors relating to COVID 19.
- c) Investigate which factors influenced their decision to proceed with or defer surgery.

Methods

A prospective, qualitative, questionnaire based study was conducted in James Connolly Memorial Hospital, located in the Dublin west suburb of Blanchardstown. Connolly Hospital is a model 3 hospital and provides medical services to a catchment area with an estimated population of 331 000 people.⁹ Ethical approval was attained from the hospital's ethics board. All patients awaiting an elective primary THA from 2 arthroplasty surgeons were identified, which amounted to 89 patients. Data was collected between 13/05/2020-20/05/2020, during the national lockdown in Ireland.

Patients were invited to partake in the study by telephone call. Of the cohort selected, 23 patients were uncontactable by phone and as such were excluded from the study. Additionally, non-English speakers and patients those with severe cognitive impairments were excluded from this study, leaving 65 participants for analysis.

Patients provided information on their demographics and subsequently completed; a Charlson Comorbidity Index (CCI), a preoperative modified-Harris Hip Score(mHHS), and a Short From-12 score (SF-12). Additionally, the patients attitude toward COVID-19, their behavioral changes and their awareness of COVID-19 were assessed using a questionnaire adapted with permission from a larger study assessing the attitudes, awareness, and actions to COVID-19 infection among those with chronic comorbidities in an American cohort.¹⁰

The modified Harris Hip Score (mHHS) is a reliable and valid Patient-Reported Outcome Measure (PROM) widely used

in the literature. The mHHS score gives a maximum score of 91 points indicating good hip function. Scores of less than 70 are considered a poor result, indicating significant disease-related impairment of activities of daily living.¹¹

The SF-12 is a self-reported health-related quality-of-life (HRQOL) questionnaire, with proven validity in the general population, and various sub-groups of patients, including patients awaiting hip arthroplasty.^{12,13} The questions are adapted from the more comprehensive Short From-36 (SF-36) for ease of administration. The SF-12 consists of 12 questions and scores participants in 2 component scores, the Physical Component Score (PCS) and the Mental Component Score (MCS), ranging from 0 to 100. The higher the component scores the greater the patients self-reported HRQOL.

The CCI is a risk stratification tool which predicts 10-year survival in patients with multiple comorbidities. It has a max score of 33, the higher a patient scores the lower their predicted 10-year survival.

Data was collected and anonymized using SurveyMonkey™ and exported to SPSS for analysis.

Descriptive statistics were calculated for all respondents. Comparisons were made between patient characteristics and responses to COVID-19 awareness, attitudes, and willingness to undergo surgery and were analyzed using in bivariate analysis using χ^2 tests, t-tests, or analysis of variance as appropriate.

Results

Patient demographics and attitudes to COVID-19: The findings of the questionnaire are summarized in Tables 1-4. The population consisted of 65 patients awaiting primary THAs. All patients surveyed cited osteoarthritis as the primary indication for their total hip arthroplasty. 54% (n = 35) of the cohort were female while 46% were male (n = 30). The mean age of the cohort was 65.6 years (SD \pm 11.7). 31% of respondents reported using regular opioid analgesia to help manage their hip pain. Patients with low SF-12 MCS scores were significantly more likely to be using opioid analgesia than those with higher scores (44.6 Vs 51.8, p = 0.04).

10.8% (n = 7) of respondents stated that they were very worried about getting COVID-19. 86% (n = 56) of patients felt that there was little or no chance of them contracting the virus. Patients 65 years or older felt at significantly more at risk of contracting COVID-19 than younger patients (χ^2 (1, N= 65) = 4.5, p = .003.). 33% (n = 22) of patients felt that it was likely that someone they knew would contract the virus. The estimated mortality rate from COVID-19 among our cohort was 16.67% (SD \pm 20%). Additionally, participants estimated that 57% (SD \pm 26%) of COVID-19 infections result in mild or no symptoms.

91% (n = 59) of respondents could name 3 or more symptoms of COVID-19, while 95% (n = 62) could name 3 or more methods to prevent disease transmission. 70.8% (n = 46) of patients stated that COVID-19 had significantly changed their daily routine, with 72.3% (n = 47) stating that COVID-19 had

Table 1. Attitudes, Awareness, and Behavioral Alterations Toward COVID-19 Across Respondents (n = 65).^a

	Mean Seriousness of threat 1-10 Scale	Not worried %	Not likely to get sick %	Symptoms %	Prevention %	Changed Daily Routine, A Lot %	Changed Plans %	Confidence in Government %	Very Prepared %	Happy to Proceed %	Unlikely to Cancel %	Inpatient Risk of COVID, Not Concerned %
Age group												
<60	74.63 (25.8)	13%	31%	94%	94%	63%	81%	63%	69%	69%	69%	67%
60-69	75.57(19.19)	33%	33%	92%	92%	79%	82%	75%	38%	71%	71%	60%
>70	81.86 (15.97)	20%	16%	88%	100%	68%	52%	80%	60%	43%	43%	44%
Sex												
Male	78.23 (16.44)	30%	23%	90%	97%	67%	70%	60%	63% [†]	47%	60%	47%
Female	76.63 (22.90)	17%	29%	91%	94%	74%	74%	85%	46% [†]	74%	66%	68%
CCI												
1-2	74.93(22.90)	23%	33%	90%	91%	73%	83%	63%	57%	63%	67%	59%
3+	79.46(17.30)	23%	20%	91%	100%	69%	63%	83%	50%	63%	61%	55%
mHHS												
<20	79.80 (20.34)	33%	40%	100%	100%	40%	60%	90%	50%	80% [†]	61%	75%
20-30	80.71 (15.62)	24%	29%	100%	100%	76%	76%	82%	47%	65% [†]	78%	67%
30-40	75.53 (21.71)	13%	33%	73%	87%	80%	80%	53%	53%	73% [†]	70%	62%
40-50	81.85 (13.80)	21%	14%	93%	100%	71%	71%	79%	64%	57% [†]	65%	46%
>50	64.44 (29.42)	33%	11%	89%	89%	78%	67%	67%	56%	22% [†]	31%	33%
SF-12 MCS												
20-30	78.33 (27.14)	33%	33%	100%	100%	100%	67%	50%	50%	50%	67%	33% [†]
30-40	77.33 (16.89)	8%	33%	83%	83%	75%	75%	92%	75%	58%	42%	44% [†]
40-50	80.66 (20.04)	17%	33%	100%	100%	67%	75%	75%	0%	75%	67%	67% [†]
50-60	81.69 (14.07)	23%	23%	92%	100%	77%	77%	92%	54%	77%	69%	60% [†]
>60	72.77 (23.15)	32%	18%	86%	95%	59%	68%	59%	73%	50%	68%	62% [†]
SF-12 PCS												
<20	61.25 (26.58)	25%	25%	75%	100%	50%	25%	25%	50%	50% [†]	50%	50%
20-30	75.07 (20.90)	33%	41%	89%	93%	63%	74%	89%	70%	70% [†]	74%	74%
30-40	84.65 (14.74)	7%	10%	93%	97%	79%	76%	72%	72%	55% [†]	52%	38%
>40	60.4 (22.30)	60%	40%	100%	100%	80%	80%	40%	40%	80% [†]	60%	80%

^a COVID-19 = coronavirus disease 2019; statistically significant values are shown in bold. [†]p < 0.05.

Table 2. COVID-19 Awareness & Concern.

COVID-19 Awareness & Concern	
On a scale of 1 to 10, how serious of a public health threat do you think the coronavirus is or might become? (1 = No Threat, 10 = Very Serious Threat)	
How worried are you about getting COVID-19	
Very worried	10.80%
Somewhat worried	35.40%
A little worried	30.80%
Not worried at all	23.10%
How worried are you about getting the flu?	
Very worried	4.60%
Somewhat worried	7.70%
A little worried	26.20%
Not worried at all	61.50%
Did you get a flu vaccine in the last year?	
Yes	72.30%
No	27.70%
Do you think you will get COVID-19	
I definitely will	4.60%
I probably will	9.20%
Its possible	60.00%
Not at all	26.20%
How likely do you think it is that you or someone you know may get sick from the coronavirus this year?	
Very likely	33.80%
Somewhat likely	30.80%
Not that likely	23.10%
Not likely at all	12.30%

forced them to delay or cancel plans they had made. Over half of respondents claimed to be very prepared if there was a national outbreak of COVID-19 (N = 35, 53.6%). Virtually all patients were happy with the government's handling of the COVID-19 pandemic, describing it as "very good" or "good" (n = 64, 98%). The majority of patients stated that they would be happy to proceed with surgery during the COVID-19 crisis (87.7%, n = 57), additionally 63.1% (n = 41) of respondents stated that they would be unlikely to cancel their THA if offered during the ongoing COVID-19 crisis.

Patient Reported Outcome Measures (PROM)

The mean mHHS in our cohort of patients was 34 (SD ± 13.2) indicating significant disease-related functional impairment. Patients with lower mHHS were more likely to want to proceed with surgery during the COVID-19 crisis than those with higher mHHS scores (mean mHHS 43.0 vs 32.6, p = 0.033). The mean SF-12 MCS for our cohort was 49.95 (SD ± 13.07) with the mean SF-12 PCS being 30.9 (SD ± 7.4). No significant differences were observed in SF-12 score and patients desire to proceed with surgery or likelihood of cancellation of surgery if offered during the crisis. The average CCI in our cohort was 2.8 (range 0-9, SD ± 1.9). No significant between group differences were observed in our study in relation to CCI and attitudes to undergoing THA during the COVID-19 crisis or perceived threat from COVID-19 infection.

Table 3. COVID-19 Knowledge, Behaviors, and Preparedness.

COVID-19 Knowledge	
Mean response (SD) to: "What percentage of people who get COVID-19 do you think will die as a result?"	16.67% (±20%)
Mean response (SD) to: "What percentage of people who get the coronavirus do you think will have only mild symptoms?"	57% (±26%)
Correctly identified 3 symptoms of COVID-19	
Yes	90.80%
No	9.20%
Correctly identified 3 methods to prevent spread of COVID-19	
Yes	95.40%
No	4.60%
Related behaviors	
How much has the coronavirus changed your daily routine?	
A lot	70.80%
Some	7.70%
A little	18.50%
Not at all	3.10%
Have you changed any plans that you have made because of COVID-19?	
Yes	72.30%
No	27.70%
Preparedness	
How happy are you with the governments handling of COVID-19 to date?	
Very happy	73.80%
Somewhat happy	24.60%
Somewhat unhappy	0.00%
Very unhappy	1.50%
How prepared do you think you are if there were to be a widespread coronavirus outbreak?	
Very prepared	53.80%
Somewhat prepared	35.40%
A little prepared	9.20%
Not prepared	1.50%

Table 4. Attitudes to Surgery.

Attitudes to surgery	
How happy would you be to proceed with surgery during the ongoing COVID-19 pandemic?	
Very happy	61.50%
Slightly happy	26.20%
Slightly unhappy	10.80%
Very unhappy	1.50%
How likely would you be to cancel your surgery if offered during the COVID-19 pandemic?	
Very likely	7.70%
Somewhat likely	6.20%
Unlikely	23.10%
Very unlikely	63.10%

Discussion

At the time of writing Ireland is on the downward slope of the first wave of the COVID-19 pandemic. Our study demonstrated that the majority of patients awaiting THA are prepared to

undergo their operation at the current level of COVID related threat. 87% of patients stated that they would be “happy” or “very happy” to undergo their surgery if offered during the COVID-19 crisis. Similar results have been found in both European and American cohorts.^{7,8} Endstrasser and colleagues noted that 79% of patients awaiting hip and knee arthroplasty would be keen to undergo surgery during the COVID-19 pandemic.⁸ Brown et al noted that 90% of patients who had arthroplasty surgery cancelled were keen to undergo arthroplasty surgery as soon as possible, with only 6% of patients wishing to postpone their operation for fear of COVID-19 infection.⁷ The perceived threat of COVID-19 infection in our cohort was low, with over 85% of patients reporting that they were at little or no risk of contracting COVID-19.

The results of this survey highlight the enormous psychological and physical toll osteoarthritis of the hip places on patients. The average age of our patient cohort was 65, which is in line with the average age of THA in Ireland and internationally.^{14,15} Our patients typically scored poorly across all PROMS, indicating significant disease burden. However, these scores may be additionally influence by the effects of COVID-19 lockdown on patients mental and physical health. Brown et al, noted that 54% of patient’s pain had deteriorated since the beginning of the COVID-19 crisis, this may have affected PROMs in our cohort. Similarly, Endstrasser et al observed a time dependent decrease in SF-12 physical component scores as the COVID-19 pandemic progressed.⁸ Similarly, our patients reported lower mHHS scores than would be expected in a pre-operative cohort.¹⁶

Our cohort of patients also had lower SF-12 scores than those which are typically seen in this age group in Ireland. The mean PCS-12 score among the general Irish public aged 50 years or older is 46.21 (SD ± 13.55). In comparison, our cohort of patients had a mean PCS-12 score of 30.9 (SD ± 7.4), which is lower than a similar study conducted on an Austrian cohort.⁸ Similarly, the mean MCS-12 score in our patients was 49.95 (SD ± 13.07), with the national average in patients >50 being 53.0 (SD ± 8.30).¹⁷

Our patients scored poorly in both mHHS and SF-12 indicating the detrimental effect of hip osteoarthritis on physical and mental health. The level of disability is comparable with those reported in both colorectal and breast cancer, diabetes, and other chronic disease states.¹⁸ As would be expected, patients with higher mHHS scores were more likely to desire postponement of their surgery than their counterparts with greater hip dysfunction.

Irish patients appear to have better public health literacy in comparison to their American counterparts. A large study performed by Wolf and colleagues found that nearly one third of American patients with chronic diseases could not identify 3 symptoms or 3 methods of preventing the spread of COVID-19.¹⁰ In comparison, greater than 90% of Irish respondents could correctly identify 3 symptoms of COVID-19 and 3 methods of prevention. The predicted mortality rate of COVID-19 was comparable with American respondents, with Irish patients reporting an estimated mortality rate of 15.6%, in

comparison with 14.2% estimated mortality reported by Wolf et al.¹⁰ Similarly, Irish respondents estimated that 57% of patients would develop only mild symptoms with COVID-19 infection, with American respondent’s estimating that 53.6% of patients develop mild disease.

Furthermore, Irish patients reported higher satisfaction with the governmental management of the COVID-19 crisis than those reported in an American population, 98% of our patients were happy with the government’s handling of to the crisis to date.¹⁰ In comparison, less than half of Americans surveyed had confidence in the government to handle the COVID-19 crisis.¹⁹

The most obvious limitation is the small sample size, which is in-part owing to the time-pressured nature of data acquisition during the ongoing pandemic, and the relatively small waiting lists in our institution. Nevertheless, important information has been gleaned. We have shown that patients awaiting total hip arthroplasty have significant levels of disease-related disability. This is detrimental to both physical and mental health, and this patient cohort are keen to undergo their surgery as soon as possible.

Conclusion

This study highlights the significant burden hip osteoarthritis places on the physical and mental health of patients during the COVID-19 crisis. The majority of patients awaiting THA are happy to proceed with surgery at current levels of COVID-19 threat, patients with higher disease-related disability are understandably more willing to undergo THA than those with better function. This may offer a potential mechanism by which to triage the large waiting list accrued as a result of the lengthy hiatus in delivery of arthroplasty services.

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