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Implementing a Virtual Mind-Body Prehabilitation Program for Patients Undergoing Thoracic Surgery – A Quality Improvement Project

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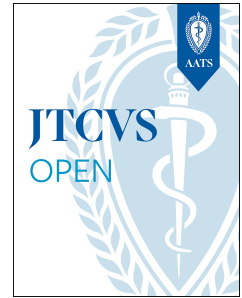
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Implementing a Virtual Mind-Body Prehabilitation Program for Patients Undergoing Thoracic Surgery –
A Quality Improvement Project

Methods

Eligibility

- Patients from thoracic oncology surgical department of an academic cancer center
- >= 18 years of age with a diagnosis of thoracic cancer
- Referred at least one week before surgery between Dec 2020- Dec 2021

Program Implementation



Two 45-minute pre-operative mind-body fitness classes each week delivered via Zoom

Outcome Evaluation



Class attendance, patient reported satisfaction and experience
Brief semi-structured interviews about participants' experience

Results

197 patients participated; 76% participation rate
71% attended at least one class

97.8% of participants **extremely satisfied**
91.2% extremely likely to **recommend to others**
90.8% agreed classes were **very much helpful** in **preparing for surgery**

Patients reported that **classes helped reduce:**
Anxiety/stress (94.2%)
Fatigue (88.5%)
Pain (80.7%)
Shortness of breath (86.5%)



Qualitative data suggests the program made **participants feel stronger, more connected to peers, and better prepared for surgery.**

Implications

This **synchronous mind-body prehabilitation program** is **highly feasible to implement** and was **well-received with high satisfaction and benefits.**

This approach may help **overcome** some of the **challenges to in-person participation.**



Figure 1 – Mind-Body Prehabilitation Program Benefits

1 **Implementing a Virtual Mind-Body Prehabilitation Program for Patients Undergoing**
2 **Thoracic Surgery – A Quality Improvement Project**

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34
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37 2018. This type of protocol indicates that waived consent and waiver of HIPAA authorization are
38 appropriate.

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48 **Abbreviations:**

49 Prehab: Prehabilitation

50 The process of enhancing physical fitness before surgery to enable the patient to withstand the stress
51 of surgery has been termed prehabilitation. Exercise is an important component of prehabilitation.

52 IMS: Integrative Medicine Service

53 ASCO: American Society of Clinical Oncology

54 MSK: Memorial Sloan Kettering Cancer Center

55 Q&A: Questions and Answers

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70 **Central Message**

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72 A virtual synchronous prehabilitation program is highly feasible to implement for patients
73 undergoing thoracic surgery and may help overcome certain challenges to in-person participation.

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94 **Perspective Statement:**

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96 Prehabilitation before thoracic surgery has been found to improve outcomes in patients with cancer,
97 however COVID-19 presented challenges to access on-site programs. This virtual synchronous
98 mind-body prehabilitation program, developed in response to COVID-19, was well-received with
99 high satisfaction and benefits among thoracic cancer patients and is highly feasible to implement.

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118 **Central Picture Legend:**

119 Virtual Mind-Body Prehabilitation Program for Patients Undergoing Thoracic Surgery

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142 **ABSTRACT**

143 **BACKGROUND:** Prehabilitation (prehab) before thoracic surgery has been found to improve
144 outcomes in patients with cancer, however COVID-19 presented challenges to access on-site
145 programs. We describe the development, implementation, and evaluation of a synchronous, virtual
146 mind-body prehab program developed in response to COVID-19.

147 **METHODS:** Eligible participants were patients seen at a thoracic oncology surgical department of
148 an academic cancer center, \geq 18 years of age with a diagnosis of thoracic cancer and referred at
149 least one week before surgery. The program offered two 45-minute pre-operative mind-body fitness
150 classes each week delivered via Zoom. We collected data for referrals, enrollment, participation, and
151 evaluated patient reported satisfaction and experience. We conducted brief semi-structured
152 interviews about participants' experience.

153 **RESULTS:** Among 278 patients referred, 260 were approached, and of those 197 (76%) patients
154 agreed to participate. Among participants, 140 (71%) attended at least one class, with an average of
155 11 attendees per class. Majority of participants reported being extremely satisfied (97.8%),
156 extremely likely to recommend the classes to others (91.2%), and indicated that classes were very
157 much helpful in preparing for surgery (90.8%). Patients also reported that the classes helped reduce
158 anxiety/stress (94.2%), fatigue (88.5%), pain (80.7%), and shortness of breath (86.5%). Qualitative
159 data further suggest that the program made participants feel stronger, more connected to their peers,
160 and better prepared for surgery.

161 **CONCLUSION:** This virtual mind-body prehab program was well-received with high satisfaction
162 and benefits and is highly feasible to implement. This approach may help overcome some of the
163 challenges to in-person participation.

164

165 **Keywords:** Prehabilitation, Virtual Mind-Body, Thoracic Cancer, Integrative Medicine

166 INTRODUCTION

167 Thoracic surgery is a critical component of cure for people diagnosed with resectable lung and
168 esophageal cancers; however, surgery can result in numerous complications with high morbidity and
169 mortality risk, especially among patients with impaired cardiopulmonary functions.^{1,2} The incidence
170 of postoperative pulmonary complications following thoracic surgery is up to 25%.³ Studies have
171 found a clear association between low physical activity levels and poor cardiopulmonary fitness
172 prior to surgery with post-operative complications, which can further exacerbate stress, anxiety, and
173 depression, and prolong post-surgery recovery in people with thoracic cancer.^{1,3-7}

174
175 Prehabilitation (prehab) programs have been found to improve functional capacity and prevent post-
176 surgical complications in this population. Fitness and prehab programs conducted among people
177 undergoing thoracic surgery have been shown to increase physical activity levels, improve
178 cardiorespiratory fitness and muscle strength, and enhance postoperative recovery.^{4,8-10} Furthermore,
179 a recent systematic review and meta-analysis conducted by Sebio Garcia et al.¹⁰ among people with
180 thoracic cancer found that prehab programs led to improvements in pulmonary function prior to
181 surgery, reduced postoperative complications, and lessened the length of hospital stay after
182 surgery.¹⁰ Most recently the American Society of Clinical Oncology (ASCO) clinical guidelines also
183 recommended preoperative exercise for patients with lung cancer undergoing surgery to reduce
184 postoperative complications and lessen length of hospital stay.¹¹

185
186 Despite potential prehab benefits, the COVID-19 pandemic has presented numerous challenges to
187 meet the needs of people with cancer who are undergoing thoracic surgery. Hence there is an urgent
188 need to develop prehab programs that are easy to access, safe, and ensure necessary physical
189 distancing for this population. In response to the ongoing COVID-19 pandemic, we piloted a

190 synchronous (live), virtual Mind-Body Prehab for Thoracic Cancer Surgery program to help prepare
191 people with lung or esophageal cancer for their upcoming surgery and post-surgical recovery. Here,
192 we describe the feasibility and acceptability of a virtual, synchronous mind-body prehab fitness
193 program for people with cancer undergoing thoracic surgery.

194

195 **METHODS**

196 *Implementation*

197 In December 2020, the Memorial Sloan Kettering Cancer Center (MSK) Integrative Medicine
198 Service (IMS) and Thoracic Surgery Service jointly launched the Mind-Body Prehab for Thoracic
199 Cancer Surgery program. The program offered free, virtual fitness and mind-body classes via the
200 Zoom videoconferencing platform to help patients with thoracic cancer prepare for their upcoming
201 surgery and post-surgical recovery (Figure 1). This study was part of the quality improvement and
202 program evaluation of the Mind-Body Prehab program and approved by the Institutional Review
203 Board at MSK. The IRB of MSK approved the study protocol 18-445 and publication of data on
204 October 18, 2018. Patient written consent for the publication of the study data was waived by the
205 IRB because this type of protocol indicates that waived consent and waiver of HIPAA authorization
206 are appropriate. Our study is reported in accordance with the Standards for Quality Improvement
207 Reporting Excellence (SQUIRE 2.0) Checklist.¹²

208

209 *Program Participants*

210 Program participants were referred by the surgeons and nurses in the Thoracic Oncology Surgical
211 Service Department from December 2020 to December 2021. In order to participate in the program,
212 participants had to be 18 years or older, with a diagnosis of thoracic cancer, proficient in English,
213 and referred at least one week prior to surgery.

214 *Program Description*

215 Each week, nurses from the Thoracic Oncology Surgical Service Department sent patient referrals to
216 our team using an internal distribution list. Program coordinators would then call the patients and
217 invite them to join the program. Program coordinators also tracked class participation and called
218 patients who did not attend classes to understand their barriers to participation, such as language and
219 technological challenges, and worked closely with the participants to overcome these issues. The
220 class instructor was also available to speak with patients to motivate them to exercise.

221
222 The virtual synchronous prehab program was developed specifically for Zoom in response to
223 COVID-19. The exercises were modeled after our existing in-person fitness classes¹³. The classes
224 were not designed to be standalone, and participants were encouraged to attend more than one class
225 depending on the window of time between enrollment and their surgery date. The program included
226 two 45-minute group classes each week via Zoom. No specific exercise equipment was needed to
227 participate in the classes. The exercises were tailored based on individual participants' strength and
228 limitations. Classes were led and supervised by a clinical fitness specialist who is also an oncology
229 nurse and respiratory therapist. A brief outline of a typical class is included below. See Table 2 for
230 the full list of exercises.

- 231 • 5 minutes: Connecting Mind-Body with mindful deep breathing exercises and mobilization
232 stretching to improve thoracic spine mobility
- 233 • 5 minutes: Warmup with continued mindful breathing with dynamic and static stretching
- 234 • 10 minutes: Cardiorespiratory muscle movement
- 235 • 10 minutes: Upper and lower body weight movements
- 236 • 10 minutes: Moving meditation with deep breathing exercises

- 5 minutes: Q&A with instructor and social connections with peers

238

239 Throughout the prehab program focus was given on mindful breathing exercises to calm the mind
240 and decrease anxiety and stress prior to thoracic surgery. Participants learned how to strengthen the
241 diaphragm and accessory muscles used for breathing. Each exercise was coordinated with their
242 breathing pattern. Muscle strengthening breathing exercises included diaphragmatic aerobic
243 breathing (e.g. fast breathing) to strengthen the diaphragm as well as body weight exercises and
244 resistance training to enhance strength and flexibility. Body weight movements incorporated
245 isometric muscle contraction (e.g. wall sits) and isotonic muscle contractions (e.g. squats, lunges,
246 shoulder press, reverse fly, latissimus dorsi pull down). Both isometric and isotonic exercises are
247 essential for building strength. Patients also learned how to coordinate their breathing when walking
248 on different surfaces (e.g. flat vs. inclined) and climbing stairs. Moreover, participants were taught
249 relaxation breathing techniques and other mind-body activities to create a feeling of calm composure
250 and down regulate the sympathetic nervous system during the stressful times before surgery.

251

252 *Evaluation*

253 We collected the following data to evaluate the feasibility and acceptability of the program. Program
254 coordinators tracked participant attendance in a spreadsheet dataset. Following each session,
255 participants were asked to complete a three-item questionnaire on Zoom using a five-point Likert
256 scale to evaluate: satisfaction with the session (1 = not at all to 5 = extremely); likelihood of
257 recommending the class to others (1 = extremely unlikely to 5 = extremely likely); and how helpful
258 the session was in preparing for surgery (1 = not at all helpful to 5 = very much helpful). Towards
259 the end of the program, we asked all patients actively participating at that point to complete
260 information about patient-reported outcomes via a four-item questionnaire on Zoom using a five-

261 point Likert scale (1 = not at all to 5 = extremely) to evaluate how helpful the session was in
262 reducing anxiety and stress, fatigue, pain, and shortness of breath.

263
264 In addition, we conducted brief qualitative interviews (n = 45) among participants who attended at
265 least one class and volunteered to provide feedback about their experiences with the program.
266 Patients were interviewed within a month of attending the prehab classes. IMS staff members with
267 qualitative research training (RH and KD) contacted participants and arranged for a phone interview.
268 Interviews lasted five to ten minutes and were transcribed. Participants were asked a series of open-
269 ended questions about their overall impressions and perception of the classes and any
270 recommendations they might have for the program.

271
272 *Statistical Analysis*

273 Descriptive statistics were used to summarize class attendance and satisfaction. For the purpose of
274 analysis, patient-reported outcome variables, such as anxiety/stress, pain, fatigue, and shortness of
275 breath, were dichotomized as reduced (merged moderately and extremely reduced) and not reduced
276 (merged not at all, slightly, and somewhat).

277
278 Qualitative data were analyzed using thematic analysis.¹⁴ One author (KS) coded all interviews.
279 Interviews were coded line-by-line to create codes arising from the data. The transcripts were coded
280 in several rounds. Codes were then compared across all transcripts to create preliminary themes. KS
281 used an inductive and iterative process, involving constant comparison, to further develop a list of
282 themes. The themes and codes were then presented to the program team (KD) to ensure the codes
283 and themes accurately represented the data. The analysis was considered complete after all authors
284 agreed upon the themes and supportive quotes.

285

286 **RESULTS**287 *Overall Program Participation*

288 Among 278 patients referred to the program, 260 patients were approached, and 197 (76%) patients
289 agreed to participate. Among the 63 patients who declined to participate, the top five reasons for
290 refusal were work conflict/too busy 16 (25.4%), very active/prefer to exercise on their own 13
291 (20%), need more information/time to think 10 (15.9%), not interested 9 (14.3%), and overwhelmed
292 6 (9.5%). See Table 1 for patient characteristics.

293

294 *Class Attendance*

295 We offered 104 Zoom classes with a total of 1,173 non-unique class attendees. Among 197 patients
296 who enrolled in the program, 140 (71%) attended at least one class, with an average of 11 attendees
297 per class. No adverse events were reported by participants in the classes.

298

299 Among 498 non-unique responses from our satisfaction survey, 487 (97.8%) were “extremely
300 satisfied” with the class, 454 (91.2%) were “extremely likely” to recommend the class to friends or
301 family members, and 452 (90.8%) felt the class was “very much helpful” in helping them prepare for
302 surgery.

303

304 In the final weeks of the program (November 2021-December 2021) we collected patient-reported
305 outcomes on several measures. Among 52 non-unique responses from our patient-reported outcomes
306 survey, 94.2% reported that the class reduced anxiety and stress, 88.5% reported that it reduced
307 fatigue, 80.7% reported that it reduced pain, and 86.5% reported that it helped coping with shortness
308 of breath.

309
310 We approached 54 participants and 45 agreed to participate in the interviews. We identified several
311 themes through our analysis of the interviews: Prehab classes helped participants get stronger, learn
312 more about the importance of exercise, and feel more confident in their ability to maintain their
313 strength after the program; participants felt connected to their peers and found comfort being in
314 similar circumstances; and the program provided personalized, tailored instruction that made
315 participants feel seen and supported. See Table 3 for supportive quotes.

316
317 **DISCUSSION**
318 In this study, we implemented a real-time synchronous virtual prehab program to meet the needs of
319 people with cancer undergoing thoracic surgery during the COVID-19 pandemic. We found that the
320 Mind-Body Prehab for Thoracic Cancer Surgery program was highly utilized and well-accepted by
321 participants. The majority of participants reported that they were extremely satisfied with the
322 program and that it was helpful in preparing them for the surgery. In addition, participants reported
323 that the classes helped reduce their anxiety, stress, fatigue, pain, and shortness of breath. Qualitative
324 data further suggest that the program made participants feel stronger, more connected to their peers,
325 and better prepared before and after surgery. Our findings demonstrate that prehab programs offered
326 synchronously in a virtual format is highly feasible and acceptable.

327
328 To our knowledge, our study is the first virtual synchronous prehab program for patients with cancer
329 undergoing thoracic surgery. Previous prehabilitation studies on cancer center- and home-based
330 exercise interventions among thoracic cancer patients, have been found to be effective at improving
331 exercise capacity, muscle strength, and quality of life.^{5,8,15} A recent systematic review by Batalik et
332 al. (2021) found that home-based exercise rehabilitation interventions among cancer survivors are

333 feasible to implement yet vary in the amount of supervision offered and rely on various forms of
334 remote monitoring and counseling.¹⁶ The current study provides a novel approach that allows for
335 real-time, personalized instruction of the group exercise session with tailored recommendations
336 based on patients' abilities.

337
338 Furthermore, cancer center-based exercise interventions present numerous barriers to in-person
339 participation, such as limited institutional resources (e.g. space), travel burden, symptom burden,
340 demanding treatment schedules, and susceptibility to infection in immunocompromised patients.¹⁰
341 Regional in-person programs between hospitals and community partners demonstrate feasibility at
342 scale and high uptake, yet still require in-person delivery and participation, which might not be
343 conducive to a patient's wants and needs during the ongoing COVID-19 pandemic.¹⁷ Virtual
344 delivery models may remove these barriers and provide easy access to much-needed interventions
345 for this population prior to surgery. In the present study, patients living in various parts of the United
346 States who come to MSK for surgery were able to participate in the virtual prehab program from
347 their homes, highlighting the vast reach of virtual programs. Future programs could explore multi-
348 site collaboration to expand participation in virtual programs.

349
350 Consistent with our study, a prior virtual synchronous mind-body intervention among people with
351 cancer was found to be feasible with high utilization and satisfaction.¹⁸ Prior prehabilitation research
352 among cancer patients with a virtual component have shown promising results, however the
353 interventions relied on home-based exercise programs with no live supervision^{19,20}. In contrast, our
354 program offered the opportunity to connect directly with the instructor and peers in real-time at the
355 conclusion of every class. The educational component of our program taught participants about what
356 to expect for their upcoming surgery, which may have helped reduce their pre-surgery anxiety.

357 Participants also commented that it brought a sense of comfort seeing their peers rejoin the program
358 post-surgery and that this motivated them to adhere to their classes. Future virtual prehabilitation
359 programs should consider a synchronous format in order to promote social connection in addition to
360 physical exercises to further support patients' mental wellbeing.

361
362 Although our program was well received and feasible to implement it might not meet the needs of all
363 patients with cancer undergoing thoracic surgery. We found that some individuals preferred to
364 exercise on their own, which means our group class structure would not be suitable for them.
365 Another barrier to participating in our program included work conflict/too busy. Technology issues,
366 such as lack of digital literacy and limited familiarity with Zoom were also found to be an important
367 barrier that prevented some individuals, especially older patients, from participating in the program.
368 There might be potential to leverage asynchronous programming using pre-recorded fitness classes
369 to accommodate those with scheduling conflicts or offer in-person classes for those with technology
370 barriers.

371
372 Our study has several limitations. This is a program evaluation, therefore it does not have rigorous
373 follow-up with participants or a comparison group. We also do not have information about
374 perioperative or long-term outcomes for those who participated in our program. Moreover, since this
375 was a program evaluation project and not a specific research project, to protect patient privacy in
376 accordance with HIPAA, we were unable to collect patient information from our Zoom classes.
377 Hence, there was no way to identify unique responses. Our data collection was convenience based
378 and we do not have the overall response rate, which might have influenced our findings.
379 Furthermore, the short length of the interviews in the context of program evaluation might have
380 precluded us from exploring in-depth patient experiences that are often part of formal qualitative

381 research. In addition, to participate in the program participants needed to be comfortable with using
382 technology or have access to a reliable internet connection, which might have limited participation
383 from patients with limited digital literacy or no internet access. Although less than 5% of the patients
384 in our study refused to participate due to technological barrier, this might be attributable to the study
385 setting being a tertiary cancer center. Furthermore, this program was completed through affiliation
386 with an urban academic cancer center. Our results may not be generalizable outside of this setting.
387 Additionally, majority of our participants identified as White non-Hispanic, which means our
388 program might not be generalizable to other race and ethnicities.

389
390 A mind-body prehab program offered synchronously and virtually was highly feasible to implement
391 and well received among patients with thoracic cancer. This program design can help overcome
392 some of the challenges to in-person participation as well as minimally supervised at-home programs.
393 Our study contributes to the limited research implementing prehabilitation programs synchronously
394 with a mind-body component. Future implementation science research should utilize specific
395 frameworks such as Reach, Effectiveness, Adoption, Implementation, and Maintenance (RE-AIM)²¹
396 or Consolidated Framework Implementation Research (CFIR)²² to help guide and implement virtual
397 programming in more diverse settings. Moreover, randomized clinical trials are needed to determine
398 if this prehabilitation program design is effective at improving patient reported and clinical outcomes
399 among patients undergoing thoracic surgery.

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470 **Figure Legend**

471 Figure 1: Implementing a Virtual Mind-Body Prehabilitation Program for Patients Undergoing

472 Thoracic Surgery – A Quality Improvement Project

473 Figure 1 shows the implementation and evaluation of a virtual synchronous mind-body

474 prehabilitation program among patients undergoing thoracic surgery.

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494 **Table 1. Characteristics of patients who participated in the program**
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Demographic Variables¹		n=197
Age, median (IQR)		68 (61-75)
Sex		
	Female, n	94 (47%)
	Male, n	103 (53%)
Race		
	White, n	172 (87%)
	Black/African American, n	5 (3%)
	Asian, n	12 (6%)
	Other, n	5 (3%)
	Unknown, n	3 (1%)
Ethnicity		
	Not Hispanic/Latino, n	177 (89%)
	Hispanic/Latino, n	11 (6%)
	Unknown, n	9 (5%)
Clinical Variables		
Cancer Type		
	Lung, n	92 (47%)
	Esophageal, n	76 (39%)
	Other, n	29(14%)
1= Variable distributions are reported as n (%) unless otherwise specified		

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516 **Table 2. Full list of exercises from the Mind-Body Prehab for Thoracic Cancer Surgery**
 517 **Program**
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Mind-Body Prehabilitation Program	
CONNECTING MIND-BODY	Mindful deep breathing exercises to calm and relax the mind Deep diaphragmatic breathing with gradual introduction of posture alignment* and mobilization stretches of the upper body, range of motion movements (allows for more efficient and effective movements-improving flexibility)
WARMUP WITH CONTINUED MINDFUL BREATHING	Shoulder shrug Shoulder rolls Elbow circles Neck stretch Figure 8 arm exercises External shoulder rotation Arm circles
CARDIORESPIRATORY MUSCLE MOVEMENT	Jogging in place Knee lifts Modified jumping jacks
UPPER AND LOWER BODY WEIGHT MOVEMENTS	Shoulder press Front Raise Lateral raise Scapulae retraction Reverse fly Lat pull down Biceps curl Triceps extension Chair squats Wall push-ups Wall sits Sumo squats Heel raises Hip mobility exercises
COOL DOWN	Moving meditation with deep breathing exercises
CONNECTING WITH INSTRUCTOR + PEERS	Question and answer session with instructor and social connections with peers
*Throughout the class, participants were taught about the respiratory system and breathing techniques. The breathing techniques covered topics ranging from why and how you breathe, the importance of posture alignment, and diaphragmatic-pursed lip breathing. Posture alignment was discussed due to its importance in helping patients use their lungs at full capacity during rest and exercise. Diaphragmatic-pursed lip breathing is also essential for	

increasing lung volume, reducing unnecessary accessory respiratory muscles at rest, and lengthening expiratory time. This also helps patients establish a more rhythmic breathing pattern that is not only physiologically, but psychologically satisfying for patients to develop a sense of inspiratory-to-expiratory timing.

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Table 3. Themes and Supportive Quotes from Participants

No.	Theme	Quote
1	Prehab classes helped participants get stronger, learn more about the importance of exercise, and feel more confident in their ability to maintain their strength after the program.	<p>"I'm feeling stronger and more confident in my physical strength and ability to stay strong and manage additional treatment."</p> <p>"I enjoyed [the sessions]. Got more aware of the importance of exercise, prepared my body to get ready for the surgery and motivated me to walk before and after surgery."</p> <p>"I like the intense physical workout and I am in a better physical shape now. I am still receiving chemo and exercise makes me feel better, has positive impact on my physical and mental wellbeing."</p>
2	Participants felt connected to their peers and found comfort being in similar circumstances.	<p>"It makes me feel good to see other people who have gone through the same surgery coming back to the classes, doing well and doing exercises and feeling great. It gives me incentive to continue exercising."</p> <p>"Classes give me a group feeling where I can know other cancer patients who have gone through surgery and are recovering."</p> <p>"There are other esophageal cancer patients like me in the class going to the same surgeons. That gives me a sense that I am not alone and gives me mental strength that other people are in there. I see many post-operative patients join the class after surgery and they are doing good. This helps me mentally prepare for my surgery and think that we can get back to physical shape after surgery."</p>
3	The program provided personalized, tailored instruction that made participants feel seen and supported.	<p>"...even though there are many cancer patients attending the classes, [the instructor] makes us feel that they are personal classes just for you."</p> <p>"...after high intensity workout [the class] will have moments of light exercises, attuned to how the body works. [The instructor] is very mindful about cancer patients and their needs."</p> <p>"[The instructor] was careful to give guidance and offer alternatives for post-surgery patients."</p>

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Figure 1 - Mind-Body Prehabilitation Program Benefits

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Implementing a Virtual Mind-Body Prehabilitation Program for Patients Undergoing Thoracic Surgery –
A Quality Improvement Project

Methods

Eligibility

- Patients from thoracic oncology surgical department of an academic cancer center
- >= 18 years of age with a diagnosis of thoracic cancer
- Referred at least one week before surgery between Dec 2020- Dec 2021

Program Implementation



Two 45-minute pre-operative mind-body fitness classes each week delivered via Zoom

Outcome Evaluation



Class attendance, patient reported satisfaction and experience
Brief semi-structured interviews about participants' experience

Results

197 patients participated; 76% participation rate
71% attended at least one class

97.8% of participants **extremely satisfied**
91.2% extremely likely to **recommend to others**
90.8% agreed classes were **very much helpful** in **preparing for surgery**

Patients reported that **classes helped reduce:**
Anxiety/stress (94.2%)
Fatigue (88.5%)
Pain (80.7%)
Shortness of breath (86.5%)



Qualitative data suggests the program made **participants feel stronger, more connected to peers, and better prepared for surgery.**

Implications

This **synchronous mind-body prehabilitation program** is **highly feasible to implement** and was **well-received with high satisfaction and benefits.**

This approach may help **overcome** some of the **challenges to in-person participation.**



Figure 1 – Mind-Body Prehabilitation Program Benefits

Supplementary Table 1- Qualitative Interview Guide

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|--|
| 1) What has it been like attending the prehab classes?
a) What are your overall impressions of the sessions?
b) What did you like about them? What didn't you like about them? |
| 2) Were there any challenges in attending the classes? If so, please explain. |
| 3) (<i>Ask this question to post-surgery patients only</i>) How comfortable are you rejoining the sessions after surgery? |
| 4) How can we improve future sessions to make our program better? |
| 5) Is there anything else that I did not ask you about the sessions that you'd like to talk about today? |