Symptoms of pelvic organ prolapse in women who lift heavy weights for exercise: a cross sectional survey.
Forner LB, Beckman EM, Smith MD. Int Urogynecol J 2019 Dec 7

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Introduction - There are important health benefits of strength training particularly for the prevention and treatment of osteoporosis, yet women with POP are often advised to avoid heavy lifting. Many clinicians are confused about how to advise women with POP about exercise, especially weight training. Patients are also confused about whether heavy weight training puts them at risk for POP development or worsening of POP.

Aim: To determine the prevalence of POP symptoms (defined as a vaginal bulge in questionnaire) and associated risk factors in women who lift and women who do not lift weights for exercise.

Participants: convenience sample of anonymous women ≥18 years old who did and did not experience pelvic floor problems, as well as physically active and non-exercising women.

Study Design: online cross sectional survey hosted by Survey Monkey Inc.

Methods: Survey was developed by physiotherapists and an exercise physiologist and was pretested. The survey was open to participants with no requirement to register or log in and was available from July 31 – October 31, 2017. It was advertised on social media as a Pelvic Health Survey; all voluntary and no incentives were given. It reached 4576 women, but only 3774 (82.5%) fully completed the survey. Survey items were not randomized as each subsequent section of the survey was intentionally built upon the previous section. It contained 97 total possible questions and took an average of 14 minutes to complete.

Survey included questions about:
1. General health, physical activity history, pregnancy information, pelvic floor symptoms
2. Symptoms of POP: assessed and defined with one question from POPDI-6 of the validated PFDI-20.
   a. “Do you usually have a bulge or something falling out that you can see or feel in your vaginal area?”
3. Proposed risk factors for PFD: parity, mode of delivery, forceps use in childbirth, family history of POP, previous hysterectomy, menopausal status, ever been diagnosed with constipation or hemorrhoids (yes/no/do not know)
4. Current and previous physical activity
   a. Women who indicated that they participated in physical activity were then asked whether they lifted “weights that are greater than 15 kg, excluding any children.”
      i. If yes, then asked to indicate the approximate maximum amount of weight lifted in any exercise.
      ii. If answered ‘no’, then asked to indicate why they did not lift greater than 15 kg (excluding children) with multiple response options including: Current/previous pelvic floor dysfunction symptoms, fear of experiencing symptoms, lack of interest or confidence in lifting weights, and advice from health professional to not lift heavy weights

Data Analysis for Table 1 & Figure 2
2. Women who indicated that they do not participate in exercise were categorized as inactive, but they did not ask why inactive.
3. Weight-lifting categories were grouped into a light-lifting group (0–15 kg), moderate-lifting group (16–50 kg), and a heavy-lifting group (>50 kg).
4. POP: As per the POPDI-6 question, symptoms of POP were considered to be absent with a score of 0 and present with a score >0.

Statistics
- Descriptive statistics were performed for continuous data(presented as mean - SD) & categorical data (presented as number – percentage)
- Chi squared test for homogeneity was used to analyze the relationship between categorical variables and presence of prolapse
• Regression analysis was used to examine the predictive relationship between independent variables and symptoms of POP
• A Bonferroni correction was applied. It is often used when multiple t-tests are performed to reduce a Type I error.

**Results - Patient Demographics - Table 1**

1. 3,934 were included in the study. Remember only 3774 (82.5%) fully completed the survey.
2. Mean age = 40.3 (18-88 yo)
3. BMI data missing for 289 women (left out ht or wt)
4. Differences in BMI data between the different weight-lifting groups.
   a. Comparing obese women to each lifting group. Greater proportion of obese women in the inactive group compared with all lifting groups (p< 0.001). There could be a number of reasons for this as women were not asked why they were inactive...for example they could have been preg, postpartum
   b. Looking at the heavy lifting group there was a higher proportion of overweight women compared with light lifting group (p < 0.001)
   c. Greater number of women in inactive group had vaginal deliveries than in the heavy lifting group (p< 0.001)
   d. More women were postmenopausal in light lifting group compared with the moderate and heavy lifting group (p < 0.001)
   e. The reason for not lifting greater than 15 kg (33 lbs) was reported by the light-lifting group –
      i. 13.7% (n=239) reported current or previous pressure/heaviness/vaginal bulge sensation as the reason and 49.2% women indicated that lifting heavier weight was not an exercise priority.

**Results: Figure 1-Total Prevalence of POP symptoms in the different groups**

1. As per the vaginal bulge question, symptoms of POP were considered to be either absent or present
2. Prevalence of POP symptoms (vaginal bulge) was 14.4% (566 out of 3934 women)
3. Inactive and light-lifting women were more likely to report POP symptoms than in the moderate & heavy-lifting groups.
4. There was no sig difference in the prevalence of symptoms between the inactive and light lifting groups or between the moderate and heavy lifting groups (p> 0.05)

**Results: Table 2-Odds Ratio for the relationship between risk factors and symptoms of POP**

1. All unadjusted risk factors except for BMI were associated with POP symptoms.
   a. With adjusted risk factors; they found that forceps delivery, cesarean section, hysterectomy, and menopausal status were NOT significantly associated with a vaginal bulge.
   b. It was vaginal parity, increasing age, family history of POP, hx of constipation and hemorrhoids that were associated increased risk of reporting POP symptom
2. Vaginal parity compared with no vaginal delivery had strongest association with POP symptoms

**Discussion- Key Points**

1. Authors noted that their 14.4 % prevalence of POP was higher than what they found to be true in primary care settings of 11.4% and that this may be due to how participants were recruited through women’s health and fitness professionals
2. Strongest association was between vaginal parity
3. The second strongest association was between inactivity and POP symptoms
   a. Authors state their data indicate that women that lift heavy weights do not have an increased prevalence of POP symptoms, instead inactivity and lifting light-weights is associated with POP symptoms. They also state these findings challenge the assumption that heavy lifting should be avoided in order to avoid risk of developing POP symptoms
4. In support of their findings, the authors contend there is a lack of literature on heavy weight training and POP and a discrepancy in the evidence for the impact of strenuous exercise on POP. Instead they point out the literature mostly addresses occupational heavy lifting.
   a. For example a Study by Masenga et al. 2018 is cited (article reference #19) looking at the prevalence and risk factors for POP in a Tanzanian rural community. They found that women who carried heavy objects >5 hours a day had a higher chance of POP AND that these women likely have to carry & lift heavy objects with farming, trading and housework up to 2-10 hours/day. Forner points out that the women in her study were lifting much less often both daily & weekly...so possibly not at the same risk.
   b. Majumdar et al. 2013 (article reference #17) is also cited where they conclude in their abstract that they were not able to link strenuous activity to POP.
   c. Middlekauff ML, et al. 2016 (article reference #18) studied nulliparous women lifting heavy weights and they reported low prevalence of POP symptoms. Forner states this supports their findings of low prevalence of POP symptoms in women that lift heavy weights for exercise and that heavy wt lifting may not promote the ‘development’ of POP.
   d. A study by Miedel et al. 2009 (article reference #13) investigated the relationship between non-obstetric risk factors and symptomatic POP (dx via POP-Q) and found that high impact physical activities (i.e. running, weight-lifting, tennis) had a lower prevalence of POP symptoms than women engaging in low-impact activities. Authors make the point that these findings were consistent with their own data. Miedel states that causality could not be determined by their data. It could not be answered if it’s high-impact training protecting against prolapse or if it’s the absence of prolapse permitting high-impact training, which is similar to the issues of incontinence & exercise.

5. They did not find an association between BMI and symptoms of POP. (The literature seems to be mixed)

6. There was a significant association in the unadjusted analysis between postmenopausal women and POP symptoms. Authors suggest the possibility that because of an increased sensitivity due to hormonal changes in menopause it can result in an increased awareness of a vaginal bulge.

7. The authors come to the conclusion that Longitudinal research is needed to determine the impact of heavy-lifting on women with and without POP, in order to give both clinicians and clients more guidance on strength training.

**Strengths**

1. Large # of participants, validated questionnaire, global participation

**Limitations**

1. Online survey with only subjective data, therefore no confirmation of POP and the grade of POP not investigated
2. No exclusion criteria for participation in the study
3. Did not ask why women were inactive and there no questions whether women were presently preg or postpartum...so if women were pregnant or postpartum ...this may be why they were inactive or why the inactive had a higher BMI.
   - It is possible that POP symptoms may have been a reason for inactivity, potentially influencing the prevalence of POP symptoms in inactive women
4. No questions about UI...leaking may have been the reason for inactivity
5. Did not know the type or frequency of exercise or the history of heavy lifting; basically we know very little about the exercises.
6. Demographics may have been limited because only those with computer and Wi-Fi access could take the survey
7. Incomplete BMI data (missing for 289 women)

**Discussion Questions:**

1. What else could the authors have added to the questionnaire?
2. It’s important to look at this topic as many women are interested in weight training.
3. More longitudinal studies need to be performed including objective data.