

FACTORS AFFECTING PELVIC FLOOR MUSCLE ENDURANCE – RESULTS FROM A POPULATION STUDY

Hypothesis / aims of study

To evaluate the effects of various clinical and demographic factors on the endurance of pelvic floor muscle contraction in a community population of women.

Study design, materials and methods

The pelvic floor muscles of 762 women, aged 18 to 76 and from 11 General Practices, were assessed by perineometry. Generally, these were women attending for routine cervical smears. Maximal vaginal squeeze pressure was recorded, as was the duration the maximal squeeze could be held (to a maximum of 19.5 seconds, set by the device). These measurements were repeated three times and the average for the three values was used in the analysis. General health (SF-36 II), incontinence (BFLUTS) and sexual function questionnaires were completed by the women.

Results

General health domains were very similar to published female norms. Reported incontinence was similar to, although slightly lower than, the community population figures for responses to BFLUTS [1]. There was no evidence that women volunteering to take part in the study were choosing to because they were symptomatic.

Median maximal squeeze pressure for the whole sample was 22 cm H₂O, median endurance 10.5 seconds. There were statistically significant differences between the groups for all four of the factors shown in figure 1 (age, parity, BMI and physical activity) for both endurance and maximal squeeze pressure. Using Cox regression, the age effect on endurance is reduced if parity is also included, and the effects of BMI become non-significant when controlled for age and parity. However, the effects of exercise are increased when controlled for age and parity. Maximal squeeze pressure follows a similar pattern, although parity shows a significant drop in strength only after parity 1 and activity does not show such a strong effect.

Interpretation of results

The variation of the two measurements follows a similar pattern with some exceptions. For endurance there is a clearer downward trend with age, the transition from nulliparity to parity is more marked for endurance and there is a decline in endurance in the most active whereas strength declines before this level. The survival functions show very clearly the difference between nulliparity and parity and that the differences relating to BMI are in the two extreme groups, that is underweight and obese. When looked at in combination, parity would appear to have a dominant influence on endurance although general exercise/activity, when age and parity are controlled for, also has a positive (increased) effect on endurance. The effects of activity are less clear for maximal squeeze pressure.

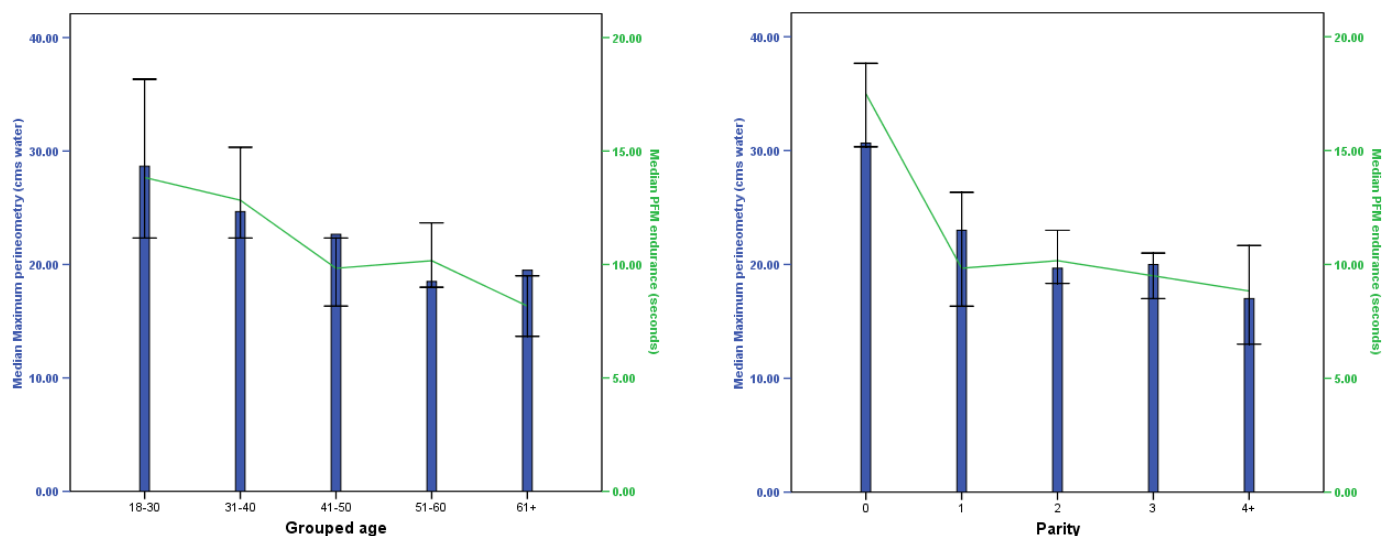
Concluding message

Increasing voluntary maximal contraction is the principal objective of pelvic floor muscle (PFM) training [2]. Recent studies have indicated that other aspects of the PFM contraction are important, including endurance [2]. These studies have been limited to symptomatic subjects or small numbers of volunteers. We report here results from a large sample drawn from a community population of women and that parity, BMI and exercise are important factors for PFM endurance.

References

[1] BJGP (1999) 49; 897-900

[2] Neurourol Urodyn (2007) 26; 397-403



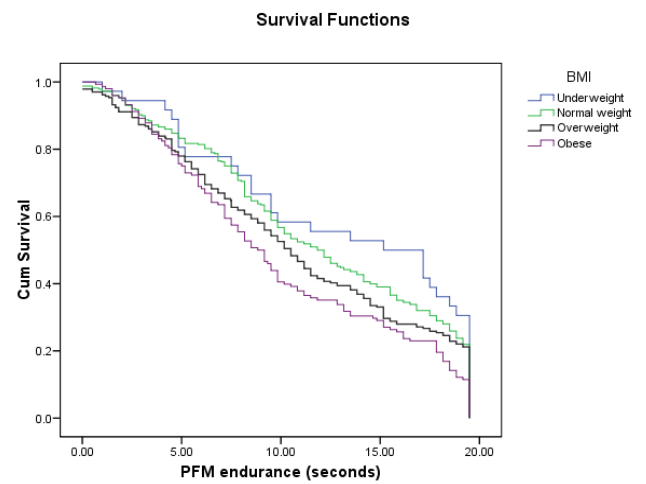
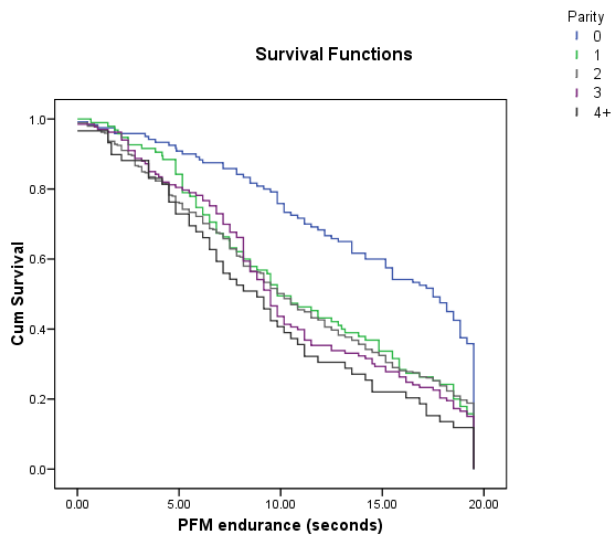
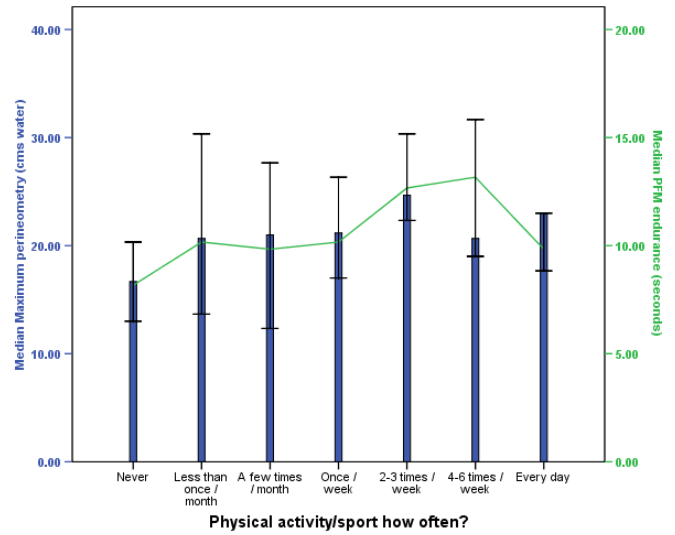
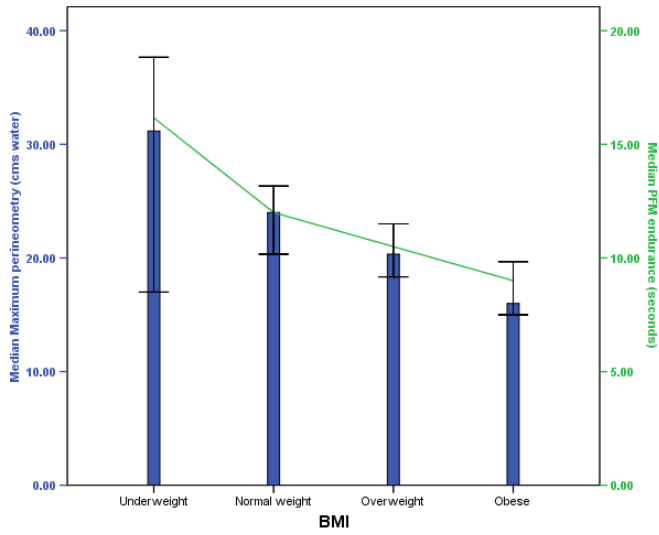


Figure 1. Median maximal squeeze pressure (blue bar) and median endurance (green line with 95% CI), plus Kaplan Meier plots of endurance for parity and BMI

Specify source of funding or grant	Wellbeing (Royal College of Obstetricians and Gynaecologists)
Is this a clinical trial?	No
What were the subjects in the study?	HUMAN
Was this study approved by an ethics committee?	Yes
Specify Name of Ethics Committee	Plymouth LREC
Was the Declaration of Helsinki followed?	Yes
Was informed consent obtained from the patients?	Yes