

## WHAT FACTORS AFFECT PELVIC FLOOR STRENGTH?

### Hypothesis / aims of study

To explore the variation in pelvic floor strength in relation to various clinical and demographic factors and prevalence of stress urinary incontinence 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. Reported stress urinary incontinence was obtained using BFLUTS questionnaire. Generally, these women were 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) and sexual function questionnaires were also completed by the women.

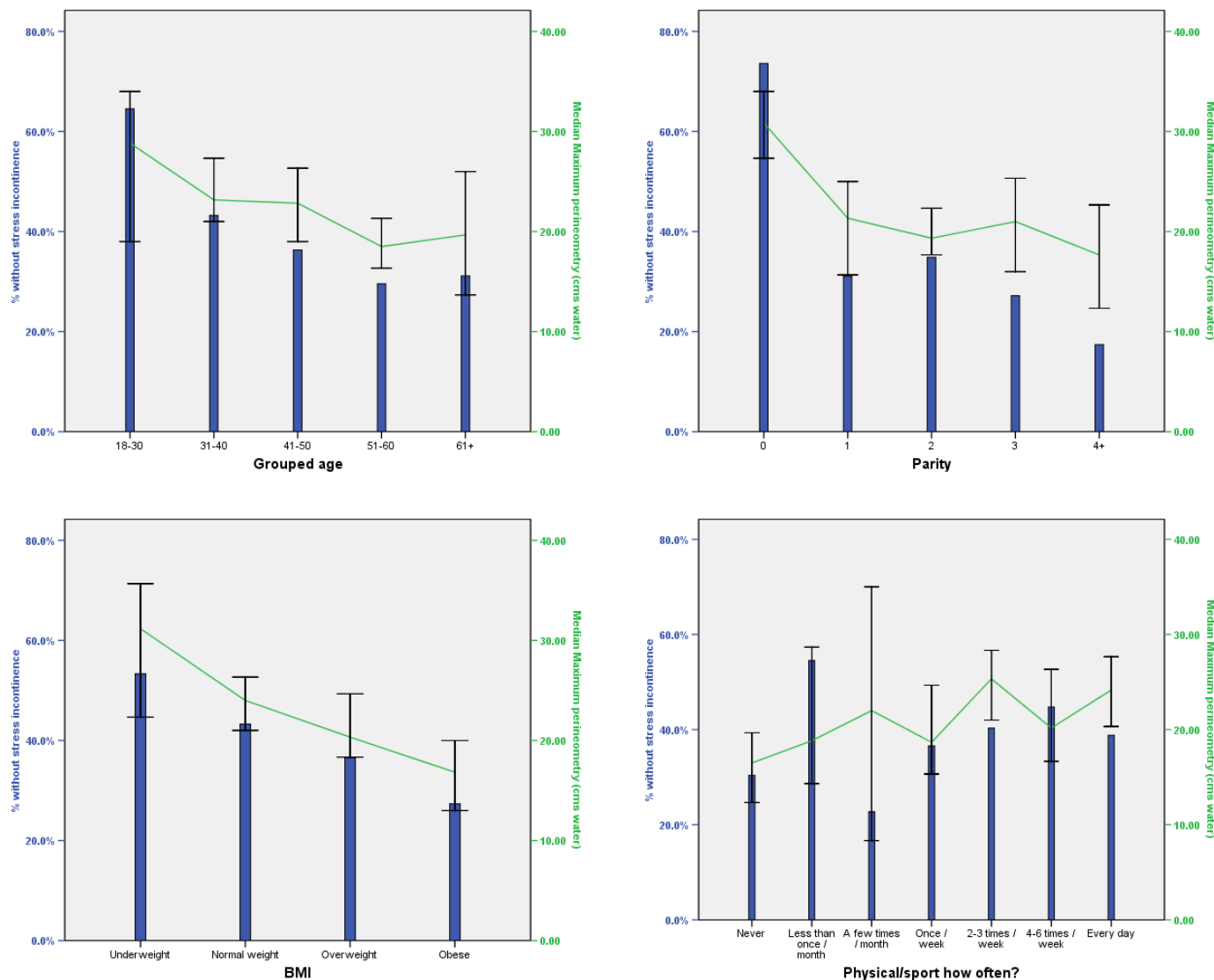


Figure 1. Median maximal squeeze pressure (green line with 95% CI) and percentage not reporting stress urinary incontinence (blue bar). (Note: the two measures are on different and independent scales. The objective is to show pattern of variation by factor not any matching of values, which has no relevance.)

### Results

General health domains were very similar to published female norms. Reported incontinence was similar to, although slightly lower than, the community population figures reported 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 (maximum perineometry, MSP) for the whole sample was 22 cm H<sub>2</sub>O. 644 women completed the BFLUTS questionnaire, and of these 38.4% reported never having a SUI episode, and 39% reported bothersomeness from SUI. From figure 1 it can be seen that median MSP varies in a similar way to SUI prevalence (% not reporting SUI is used to show trends in the same direction). MSP declines with age until 50, with a possible slight increase over 60. The very elderly were not included in this study. SUI prevalence follows a very similar pattern. Likewise, MSP declines with parity although strength declines to parity 2 whereas SUI reduces again with parity 2 after a large increase from 0 to parity 1. MSP decreases with increased BMI

and this is mirrored in SUI. The pattern for physical activity is more complex. Generally there is an increase in strength with greater physical activity with two slight dips. SUI also shows a general decrease with increased activity although the detailed pattern varies. The variations are significantly different (Kruskal-Wallis and Chi-squared tests) over all 4 factors except for SUI and physical activity ( $p = 0.186$ ). When adjusted for parity (but not age) SUI does show significant variation in relation to physical activity (using logistic regression).

#### Interpretation of results

The variation of the prevalence of SUI in relation to many factors is well established. The variation of pelvic floor muscle strength and SUI follows a similar pattern with some exceptions. Long term, moderate physical activity has been found to be inversely associated with urinary incontinence [2].

#### Concluding message

We report here results from a large sample drawn from a community population of women, showing that increasing age and BMI and being parous are all associated with lower pelvic floor muscle strength and that moderate physical activity is associated with increased pelvic floor muscle strength. The prevalence of SUI generally mirrors these trends. These findings have implications for pelvic floor muscle training.

#### References

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

[2] J Urol (2008) 179; 1012-1017

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