

Identification of teachers at risk for phonotrauma using ambulatory monitoring of speaking fundamental frequency

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Excessive mechanical stress

- partially related to speaking fundamental frequency (f_0)
- vocal folds tissue damage (i.e. phonotrauma)
- risk factor for voice disorders in professional voice users

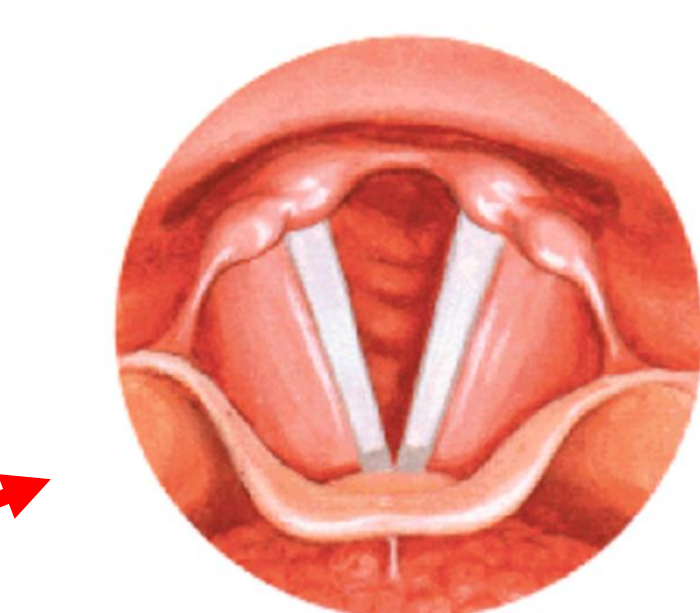
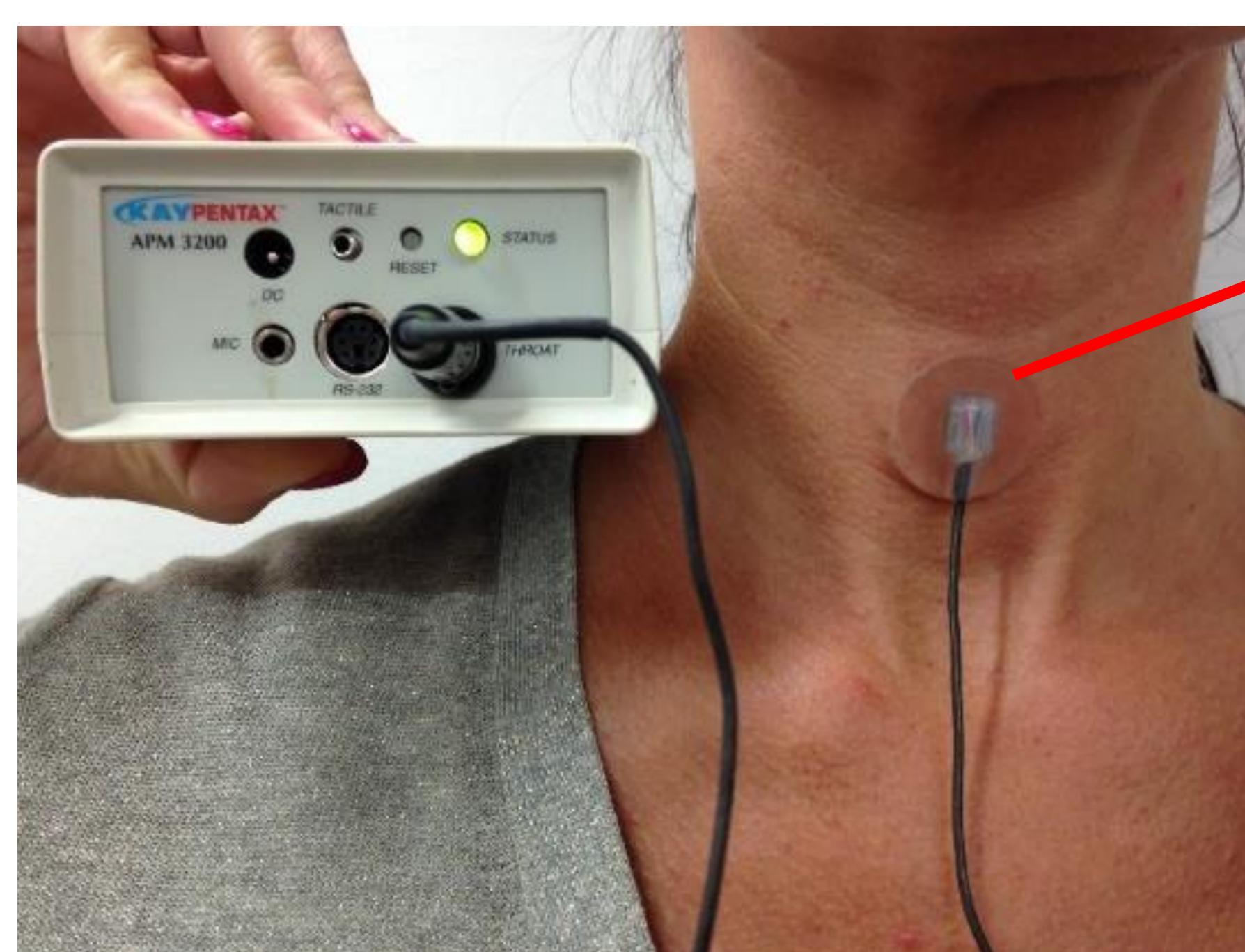
Study aim: to evaluate several individual factors to determine whether they can predict teachers' speaking f_0 and help to identify those who are most at risk of phonotrauma.

Participants: 87 teachers without pathology

Teaching level	Female	Male	All
Kindergarten (K)	21	0	21
Elementary (E)	20	0	20
Secondary (S)	20	15	35
University (U)	5	6	11

Data acquisition

f_0 monitored in real-life situations during 1 workweek



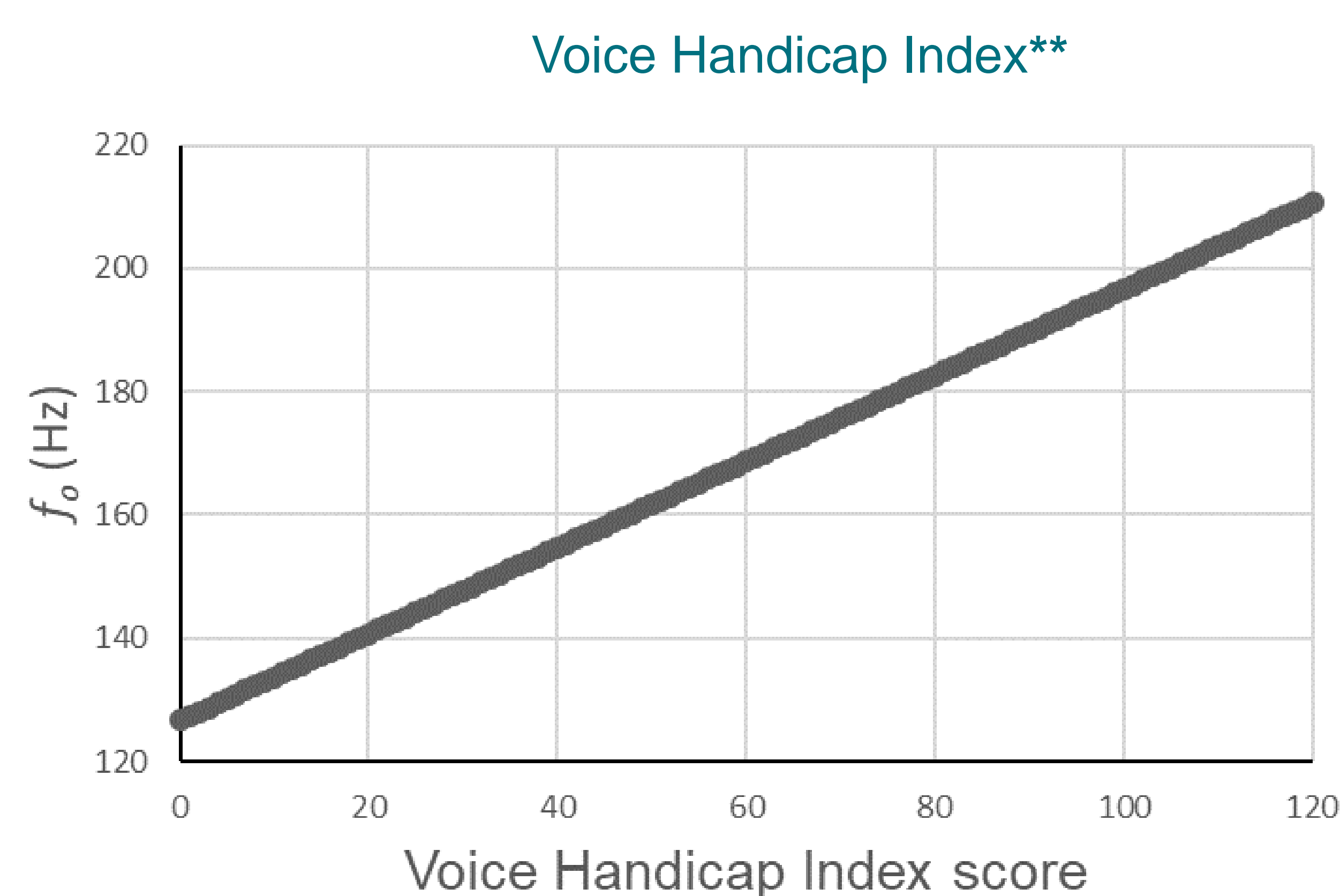
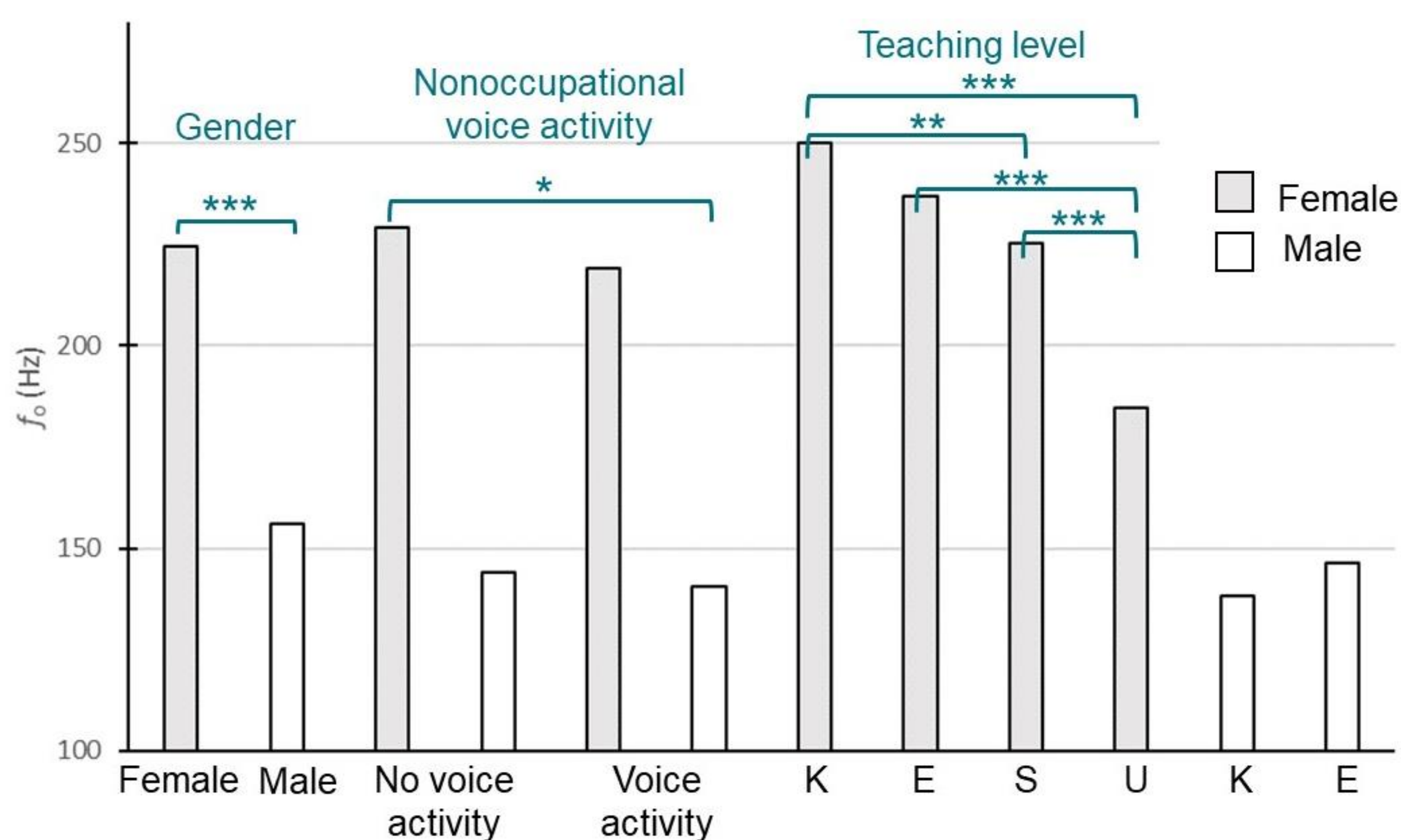
f_0 extracted every 200 ms during 5 days/participant
Total: 431 days (4,479 h)
 Autocorrelation algorithm.

Ambulatory Phonation Monitor (KayPENTAX)

Individual factors (questionnaire)

- Gender (66 females, 21 males)
- Age (mean = 40 ± 9.5 y.)
- Teaching experience (mean = 15.2 ± 8.5 y.)
- Teaching level
- Nonoccupational voice activity (20 yes; 67 no)
- Voice education (22 yes; 65 no)
- Past voice problems (29 yes; 58 no)
- Voice Handicap Index (mean = 11.6 ± 10.2)
- Tobacco consumption (10 yes; 77 no)
- Gastro-esophageal problems (15 yes; 72 no)

Results



Legend: * = $p < .05$; ** = $p < .01$; *** = $p < .001$

Conclusion: Prevention and early detection should be offered primarily to individuals at risk of phonotrauma due to higher f_0 , namely females, and specifically those teaching at the kindergarten and elementary levels. Self-assessment questionnaires such as the Voice Handicap Index could help to detect individuals with potentially harmful f_0 patterns. The lower f_0 of teachers who engage in nonprofessional voice activities may suggest acute inflammation or muscle fatigue due to voice overload.