

APM in monitoring vocal load in front-line nurses and clerks in a public service

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In last years, work health medicine payed more and more attention to occupational vocal load's assessment and occupational dysphonias' prevention. Though "vocal load risk" in artists, teachers or call centres is almost worldwide "accepted", changing of work habits involves more and more workers in using their voice much more than in the past.

Nurses' mansions protocols deal now with "caregiving", "casemanagement", "customer satisfaction". Everyday, mostly if working in policlinics or wards instead of units, nurses have not only to support physicians and surgeons, but also to inform and instruct patients and their relatives about cares, protocols, use of rehab instruments... Besides, in our Insurance Center, which is like a regional headquarter, they have to provide contacts with our other regional centers, patients at home, outfitters and purveyors, covenant services and take part in work meetings and updating courses.

But in our Institute, an Insurance, worker's population consists mostly of clerks. Some of them have to deal with "front-office" tasks, partly as a call centre partly "face to face" with insurants.

Aim of this work was to assess if workday vocal load in our "front office" clerks corresponds or not to our nurses' one and if there's or not risk of vocal abuse in one or both of these groups.

Clerks have a front-office work, directly speaking to users one day every three, while on the other two days have mostly to answer phone calls or mail – web questions.

Nurses have a front-office work, directly speaking and instructing users everyday, but in the meanwhile they have to reply to phone calls from other regional centers, to organize ten physician's "agendas" and call other centers to let them know what else is necessary to plan in the case management.

In our Center we have only one KayPentax APM mod.3200, so we couldn't let subjects take it home with them and wear it all day long as suggested in recent works (1). We choose to make them wear it during their "workday": it means five hours per day, from 8.30 till 13.30, before they had lunch. They wore APM for 4 days, even if not always subsequent.

We tried with a small group, but reduced it to 4 clerks and 4 nurses, because of problems with continuous testing in some other subjects.

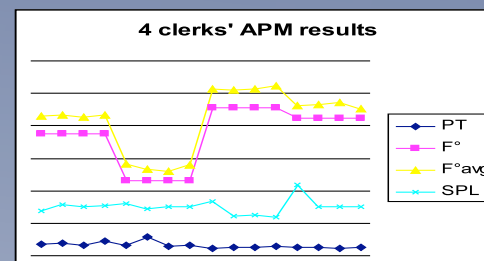
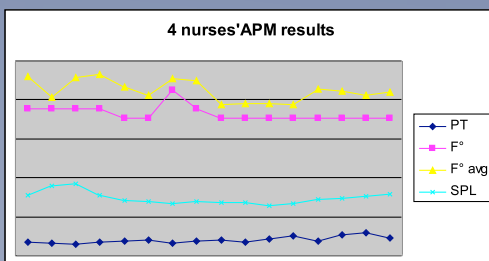
Nurses were all female, age 36-53; clerks were three female and one male, age 35-56.

Only one of them, MC, had a previous history of bilateral Reinke's edema, with phonosurgery in early 2008.

None of them showed signs of glottal pathologies

None of them gave VHI total score above 30.

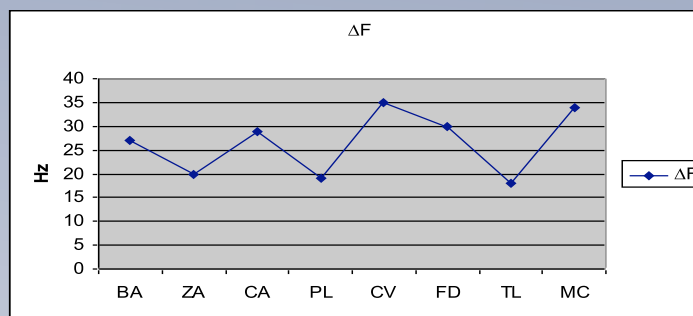
Subject	age	PT	F°	F° avg	SPL
CV	36	16,77	188	230,2	77,2
		15,93	188	202,98	89,52
		14,09	188	228,27	92,41
		16,83	188	232,92	77,9
FD	39	18,87	176	216,86	70,63
		19,53	176	206,21	69,18
		16,49	212	227,29	67,27
		19,33	188	224,87	69,86
TL	53	20,01	176	194,44	68,21
		17,18	176	194,73	68,82
		21,85	176	194,69	64,59
		25,64	176	193,47	66,2
MC	52	18,2	176	213,46	72,75
		27,36	176	211,42	73,63
		30,01	176	205,27	75,83
		22,69	176	210,46	78,98



Phonation time "5h" is 15,77% in clerks and their medium SPL is 75,16 dB
Phonation time "5h" is 20,05% in nurses and their medium SPL is 73,94 dB

Might be interesting to observe the "delta" between F° and F° average in each subject: two clerks and three nurses have a delta from 27 till 35Hz in workday's spoken voice from their F°.

Subj	ΔF
BA	27
ZA	20
CA	29
PL	19
CV	35
FD	30
TL	18
MC	34



Sub.	Age	PT	F°	F° avg	SPL
BA	46	17,99	188	214,33	69,7
		18,83	188	216,24	78,38
		16	188	213,17	74,81
		22,21	188	217,25	77,15
ZA	36	16,4	116	141,65	80,5
		28,76	116	132,77	71,49
		14,73	116	129,88	75,33
		15,38	116	138,8	74,6
CA	56	11,87	228	256,46	82,94
		13,54	228	254,32	61,47
		13,2	228	256,32	62,15
		13,7	228	261,98	59,61
PL	35	13,1	212	230,63	108,73
		12,34	212	232,34	76,1
		11,61	212	235,89	75,3
		12,74	212	226,8	75,9

Conclusions
As used in Noise Induced Hearing Loss prevention acoustical measures, to avoid confusion between data from work in literature, might be useful to "notify" to which period of evaluation is related a Phonation Time percentage: for instance PT "18-24 hs" for a "workday plus extraworkday" monitoring. So in our work we wrote **PT "5hs"**, because we monitored our subjects only 5 hours per day. To other Authors dealing with APM, much more than we do, evaluate if accept or not this kind of "annotation".

Even if in a very small group and for a very limited monitored time, APM seems to find out very high values of "occupational vocal load" and vocal risk exposure in nurses than in clerks.

Nurses' occupational vocal tasks seems to be heavier and heavier from 5% in voice in 1988 (2,3) Our 20,05% would be higher of most PT % in teachers, if confimed in further works with wider group of subjects and longer time of monitoring, comprising of recovery time. In another work of our group, one of our nurses' thesis now to be discussed (4), in a population of 310 nurses from wards, units and policlinics, only the group (52 out of 310) of policlinics' nurses showed a 10,6% VHI scores above 30, with physical and functional scales with highest levels of subjective discomfort.

The last hint from this small work could be about "coping" strategies: two out of four clerks and three out of four nurses showed a rather high delta from their F° Hz value to their F° average Hz value.

Is this expression of a wide dynamic or, instead, of an anti-ergonomic strategy derived from a wrong vocal technique? Or a less efficient "coping" strategy in front-office situations?

Might be related to danger for vocal health? (the second highest delta is in the "former Reinke's edema" subject)

We plan to check APM feedback on these subjects, to help them control their F° and then retest in some months.

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