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Use of evidence-based practice among French health professionals after the implementation of a new competency-based curriculum

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Abstract:

Background: Although evidence-based practice (EBP) has been spreading since the 1990s, it has not yet been sufficiently implemented. **Aim:** Following the reform of initial training for allied health professions in France in 2012, we sought to determine whether the new curriculum was associated with more frequent use of EBP. **Methods:** We performed an

online, cross-sectional survey of nurses, occupational therapists, and podiatrists (divided into pre- and post-reform groups) in June 2018. The questionnaire covered demographic data, use of EBP, and the perception of EBP. As holding a Master's degree may enhance knowledge and use of EBP, we adjusted for this variable. Categories to analyse qualitative data were created regarding the five steps in EBP, and its definition. **Results:** N=595 (pre-reform group: n=301, post-reform group: n=294). The proportion of respondents who frequently read the professional literature was lower in the post-reform group than in the pre-reform group (33% vs. 54%, respectively; OR [95% CI] = 0.52 [0.37-0.73], $p < 0.001$). The main stated reasons for reading the professional literature were "keeping up to date with practice" and "making clinical decisions". Respondents in both groups mentioned a lack of time as the most frequent barrier to reading the literature (82%), a lack of access to bibliographical resources, and that EBP was not encouraged. Most professionals limited their definition of EBP to reading the literature and implementing research results. **Discussion:** Our results raise questions about the role of institutions, the content of initial training, and continuous education for allied health professionals. The French healthcare system's organisational and financial structure may notably explain the barriers encountered. The main limitations to the extrapolation of our results were the self-reported data. **Conclusion:** EBP is still not widely implemented among allied health professionals - raising questions about both practice and training.

Keywords: evidence-based practice; allied health profession; France; curriculum reform; nurse; occupational therapist; podiatrist

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Background

The concept of evidence-based medicine was first developed in 1992 (Schaefer & Welton, 2018) and defined by Sackett (1996) as *“the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients”*. It then evolved into evidence-based practice (EBP), so as to encompass allied health professionals and not solely physicians. The concept continued to spread, notably through Satterfield et al.’s transdisciplinary model (2009) stating that EBP includes the practitioner’s expertise, the patient’s preferences, and the best research evidence in a specific context. Five EBP activities have been defined: formulating clinical questions, searching databases and other sources, appraising research reports, participating in implementation, and participating in evaluation (Sackett, Strauss, Richardson, Rosenberg, & Haynes, 2000).

In response to the development of EBP, several allied health professional organisations have published position statements (Canadian Association of Occupational Therapists, 2009; Occupational Therapy New Zealand Whakaora Ngangahau Aotearoa, 2006; Occupational Therapy Australia, 2018; International Council of Nurses, 2009). However, despite general agreement on the importance of applying EBP, Schaefer and Welton (2018) have reported that *“the implementation of evidence based practice into practice at the bedside is slow”*. Harding et al. (2014) corroborated this finding, and stated that healthcare practitioners were usually quite enthusiastic about EBP but rarely applied it in practice. This paradox was illustrated by Grol and Grimshaw’s study (2003), which found that (i) 30 to 40% of patients did not receive EBP, and (ii) 20 to 25% of administered treatments may be unnecessary or even harmful (cited in Boström, Sommerfeld, Stenhols, & Kiessling, 2018).

Therefore, initial training in EBP for future healthcare professionals appears to be essential for encouraging the uptake of this approach.

In order to join the European framework for higher education, the French government started to reform the initial training programmes for allied health professionals at the end of the 2000s (Ministère de la Santé et des Sports, 2010). One of the main changes was the introduction of a competency-based curriculum, with more emphasis on EBP. For example, all the reformed curricula cover methods for assessing professional practice, and the use of professional and scientific data. The first nurses to have been trained under the new national curriculum graduated in 2012, occupational therapists (OTs) in 2013 and podiatrists in 2016. Physiotherapists are due to follow in 2019.

Hence, the primary objective of this study was to determine whether allied health professionals having been trained in France under the new curriculum use EBP more than their predecessors do. The secondary objectives were to (i) determine which of the five EBP activities were performed by the “post-reform” allied health professionals, and (ii) measure the extent to which allied health professionals consider EBP to be important in their daily practice.

Methods

Study design and participants

We performed an online, cross-sectional survey of nurses, OTs and podiatrists working and having been trained in France.

Study instrument

The online survey's design and content were inspired by previous research findings (Thomas & Law, 2014; Benett, et al., 2016; Boström, Sommerfeld, Stenhols, & Kiessling, 2018; Verloo, Desmedt, & Morin, 2016). The questionnaire was designed by four investigators (CE, FB, IBG and BC), reviewed by a methodologist (FCP), revised, and then modified further after testing on five healthcare professionals (two nurses, two OTs, and a podiatrist).

The questionnaire comprised sections on demographic data (eight questions), the use of EBP (six questions), and the perception of EBP (two questions). In the two last sections, six questions had a multiple-choice format, two (with respectively six and eight statements) used a 6-point Likert scale ranging from *never* to *very often*, and one (with nine statements) used a 4-point Likert scale ranging from *strongly disagree* to *strongly agree*. The multiple choice questions included an "other answer" option. The last question was open-ended; the respondent was asked to define EBP.

Data collection

Five nursing training institutes, three occupational therapy colleges and five schools of podiatry in and around Paris were contacted by e-mail or via their website in June 2018. The institutions were asked to forward our e-mail to their alumni. We also used personal networks and social media to disseminate our survey invitation. A reminder was sent 3 weeks later. Each questionnaire was filled out anonymously online. Consent to participation

in the study was inferred through completion of the questionnaire. The survey closed on July 5th, 2018.

Analysis

Continuous variables were described as the median [interquartile range (IQR)]. Categorical variables were described as the number (percentage). The respondents were split in two groups: those who graduated before the reform (the “pre-reform group”), and those who graduated afterwards (the “post-reform group”). The two groups’ characteristics were compared by using Student’s t test for continuous variables and Pearson’s chi-squared test or Fisher’s exact test (as appropriate) for categorical variables. We hypothesized that holding a Master’s degree might be associated with greater knowledge and use of EBP, and so we adjusted the results for this variable. Odds ratios (ORs) were estimated with their 95% confidence intervals (CIs), and assessed using the Wald test. All tests were two-tailed, and the threshold for statistical significance was set to $p < 0.05$. Analyses were performed using Stata software (version 15.0, StataCorp LLC, College Station, TX, USA). For the open-ended question, manual thematic content analysis was performed by two investigators (CE and FB), and any disagreements were resolved by consensus. First, categories were created with regard to the five steps in EBP, Sackett’s definition, and Satterfield et al.’s transdisciplinary model, and then adjusted to match the respondents’ answers.

Results

A total of 605 questionnaires were received. Four were excluded because the respondents had not stated their profession, and six were excluded because the

respondents had not stated their year of graduation. Hence, 595 questionnaires were included in our analysis.

The sample's demographic characteristics are summarized in Table 1. Fifty percent of the respondents were nurses, 49% were OTs, and 1% were podiatrists. In total, 294 (49%) respondents had followed the new curriculum. Ninety-six respondents stated that they held a Master's degree (26% of the pre-reform group and 6% of the post-reform group), and five (0.6%) stated holding a PhD (four in the pre-reform group and one in the post-reform group).

Reading habits

The proportion of professionals stating that they read any kind of literature (i.e. formal or informal professional or scientific data, either on the internet or in journals) at least once a month was lower in the post-reform group than in the pre-reform group ($p < 0.001$). The post-reform professionals were also less likely to read international journals more than once a month (even after adjustment for holding a Master's degree; $p = 0.002$) or to visit official websites (e.g. published by the French Ministry of Health, the Regional Health Agency, etc.) more than once a month ($p = 0.014$). While the proportion of professionals stating that they read the professional literature less than twice a year was higher in the post-reform group, this difference was not significant after adjustment for holding a Master's degree. In each group, about 11% of the respondents stated visiting a library more than once a month, and about 6% participated in journal clubs (Table 2).

Reasons for reading the literature

In both groups, the main reason for reading the literature was to stay up to date about the field of practice (Table 3). More than half of the respondents in each group also stated that reading the literature helped their individual clinical decision making. About 40% of the respondents in each group also read in order to share information during informal discussions (rather than in formal meetings). Respondents in both groups stated that reading the literature helped them to tutor trainees. In both groups, respondents felt more encouraged to read by their peers than by their line manager. After adjustment for holding a Master's degree, respondents of the post-reform group were less likely to want to (i) prepare an article for a journal ($p < 0.001$), (ii) prepare an oral presentation for a congress ($p < 0.001$), and (ii) supervise and revise student dissertations ($p < 0.001$).

Barriers to reading the literature

In both groups, the vast majority of respondents mentioned a lack of time as the primary barrier. However, the proportion was higher in the post-reform group than in the pre-reform group - even after adjustment for holding a Master's degree (85.4% vs 78.4%, respectively; $p = 0.037$). Close to 50% of the respondents mentioned a lack of access to bibliographical resources, and around 20% stated that the implementation of EBP was not encouraged or acknowledged in their professional practice; there were no significant intergroup differences in these respects. Although almost 50% of the respondents in the pre-reform group mentioned poor English as a barrier to reading, this proportion was only 30% in the post-reform group ($p < 0.001$). A small proportion of the respondents (8.6% and 5.1% in the pre- and post-reform groups, respectively; $p = 0.169$) did not perceive any barriers to the

use of EBP. Lastly, four respondents in the post-reform group stated they did not really see the point of EBP (Table 4).

Current and wished-for access to the literature

About one-third of the respondents in each group reported having access to a library at their place of work, and about the same proportion reported having access to scientific articles more specifically (Table 5). About half of the respondents wished that they had greater access to libraries and articles but only a few had actually asked for it. The post-reform group was less likely to report having access to journals ($p < 0.001$) and human resources ($p = 0.010$) than the pre-reform group. Conversely, the post-reform group was more likely to wish to have access to resources (articles: $p = 0.064$; journals: $p < 0.001$; human resources: $p = 0.013$). However, the intergroup difference in the proportion of respondents having requested more access to resources was not significant.

Definition of EBP

A total of 350 participants answered this question, and 341 answers could be analysed (197 in the pre-reform group and 144 in the post-reform group). In the post-reform group, 15 of the respondents (10%) said they did not know what EBP was; a similar value (9%) was found in the pre-reform group ($p = 0.693$). Nineteen of the post-reform group gave a one-word answer: this tended to describe what they thought about EBP in general ("essential", "necessary" or "important", for example; $n = 15$), or how they felt personally about EBP ("interesting", "reassuring", or "rewarding", for example; $n = 3$). Most of the

respondents considered that it was important to use EBP, and 33% mentioned that EBP was “scientific”, “proven” or “factual”. Similar results were found in the pre-reform group.

One respondent in the post-reform group mentioned a literature reference (Sacket et al.), and one mentioned all five of the EBP activities. None of the respondents in the pre-reform group mentioned a literature reference or the five EBP activities, although two respondents clearly stated that formulating a clinical question was the first step. One respondent in each group mentioned that healthcare professionals needed to critically appraise research reports. Only 6% of the respondents in the post-reform group stated that the patient’s opinion was included in EBP, and only 8% mentioned the inclusion of experience. These values were similar in the pre-reform group. Furthermore, 13% of the post-reform group stated that EBP did not correspond to real-life practice or felt the need to specify that EBP had to be adapted to each situation – as if this aspect was not part of EBP. This opinion was expressed by a significantly smaller proportion (6%) of the respondents in the pre-reform group ($p=0.024$).

However, 15% of the respondents in the post-reform group mentioned that the use of EBP enabled the development of professional competencies, helped them to stay up to date or helped them to optimize patient care. For example, one respondent in the post-reform group wrote that *“EBP allows you to match your practice as closely as possible to the patient’s needs, while developing your skills”*. Only 6% of the respondents in the pre-reform group stated that EBP helped them to optimize patient care ($p=0.009$). Further, 12% of the respondents in the post-reform group said that EBP was a useful decision-making tool; this

proportion in the pre-reform group was lower (6%) but the difference was not significant ($p=0.062$). Respectively 8% and 7% of the post-reform and pre-reform respondents said that EBP enabled them to justify their treatment choices ($p=0.544$). Lastly, about 2% of the respondents in each group mentioned EBP as a way of highlighting the value of their profession.

The impact of the respondent's profession

We also analysed the results in the post-reform group depending on the professions. A few differences appeared after adjustment for holding a Master's degree: the proportion of respondents stating that they never or almost never read the professional or scientific literature was higher for nurses (28%) than for OTs (7%; $p<0.001$). Nurses were reportedly less likely to want to stay informed about their profession (66%, vs. 88% for OTs; $p<0.001$) or their field of practice (38%, vs. 74% for OTs; $p<0.001$), or to want to prepare oral presentations (2%, vs. 15% for OTs; $p=0.002$) or share information with peers (27%, vs. 48% for OTs; $p<0.001$). Nurses were less likely to express a wish for easier access to bibliographical resources (37%, vs. 57% for OTs; $p<0.001$).

Discussion

Our results show that the new curriculum followed by allied health professionals in France from 2012 onwards has not impacted the new graduates' use of EBP, when compared with colleagues having followed the old curriculum. We found that in both pre- and post-reform groups, most respondents thought that EBP corresponded solely to searching for data in clinical studies and applying these data in practice. The three other typical core EBP activities (formulating questions, appraising research reports, and

participating in evaluation) were mentioned much less frequently. The concept of EBP itself did not appear to be very familiar; although most of the respondents stated that EBP has to be adjusted to match clinical practice and to take the patient's opinion into account, they did not realize that these two steps are indeed part of the core EBP process. Hence, it seems that Satterfield et al.'s transdisciplinary model of EBP (highlighting the practitioner's expertise, the patient's preferences and the best research evidence, in a specific context) is not well known. We also found that post-reform group was less likely to read the professional and scientific literature. Even though English is now perceived to be less of a barrier to reading (perhaps because English is included in the new curriculum), the respondents in the post-reform group were less likely to read the international literature on a regular basis than the respondents in the pre-reform group were.

A number of barriers to the use of EBP among allied health professionals have been identified. The World Health Organisation (WHO) (2017) has grouped these barriers into four categories: (i) organisational factors (i.e. insufficient support from management, lack of an organisational culture in support of EBP, or resource shortages), (ii) leadership and management (i.e. EBP not being defined as an aim of the institution, or insufficient support for staff), (iii) professional aspects (i.e. inadequate knowledge and skills in EBP, lack of time, or disagreement with the guidelines) and (iv) evidence (i.e. high-quality studies not available, information overload, or unclear clinical practice guidelines). In the present study, respondents identified lack of time as the main barrier to the use of EBP. However, as reported by Harding et al. (2014), "*I haven't got time*" is a fuzzy reason that can encompass resources, attitudes, expectations, and knowledge. Twenty-seven percent of the

respondents in our post-reform group stated having access to a library at their place of work; this proportion is lower than for Canadian OTs (51%) reported by Thomas and Law (2014). Surprisingly (in view of the frequent wish for better access to professional literature), only a few respondents had actually asked for this access. This finding can be linked to the WHO's "leaders and management" category. In the context of France's hierarchical model, almost a fifth of the respondents in the post-reform group felt that EBP is not valued by peers or by managers in their field of work. This finding might also be related to the fee-for-service model that is predominantly employed in the French healthcare system: coding acts does not include reading the literature or analysing one's own practice. Furthermore, the use of EBP might not be a target set by healthcare institutions. Even though nurses are encouraged to use scientific data in their practice, the term of EBP is not mentioned specifically in the profession's Code of Ethics – despite an update in 2016. Along with a growing workload, one can imagine that spending time on the whole EBP process is not seen to be essential in the field. Lastly, a lack of teaching on skills and accessing to information (Hardling, Porter, Horne-Thompson, Donely, & Taylor, 2014) was not mentioned as a barrier. However, a few respondents mentioned that critical appraisal of the literature should be taught as part of the initial training, since they did not know whether or not they could trust published results.

Our results have to be put in a historical context: in France, most nurses were members of religious orders up until World War One, after which time the profession was recognized. However, obedience and subservience (far removed from an EBP approach) prevailed among French nurses until May 1968 (Calbéra, 2003). Occupational therapists have always been more independent of religious institutions. However, even though EBP was

highlighted as being important for OTs in the UK as early as 1997 (Cameron, et al., 2005), the first French publication to mention it clearly appeared in 2010 only. Hence, EBP is a relatively new requirement for allied healthcare professionals in France.

Nevertheless, French allied health professionals were consistent in the importance they gave to EBP; most stated that EBP was important, especially for improving their practice and/or profession and for justifying their choices. Even though there may have been some social desirability bias, only 1.4% of the respondents in the post-reform group did not see the point of working with an EBP approach. This proportion is similar to that reported by Lafuente-Lafuente et al. (2019), who found that 3.1% of the healthcare professionals they studied (144 physicians, 64 nurses and 24 pharmacists) did not agree with the EBP concept. Hence, a lack of interest in EBP by new graduates does not seem to be a barrier, this is in line with Morel-Bracq et al.' report in which 82% of the surveyed OTs considered that reading the professional literature is essential.

Our study presented several limitations, starting with the sampling method; the use of social media to recruit participants prevented us from determining the response rate, and people with a prior interest in EBP might have been over-represented. Furthermore, OTs were overrepresented and nurses were underrepresented, relative to the proportions of these professional in France (an average of 97% of nurses, 2% of podiatrists and 1% of OTs between 2001 and 2018) (Ministère des Solidarités et de la Santé). In fact, our proportions were 50% for nurses, 1% for podiatrists, and 49% for OTs. Furthermore, 49% of our respondents had a higher degree (e.g. 16% held a Master's degree). This does not appear to be representative of the general population of professional: according to a survey of 712

respondents by the French National Occupational Therapy Association (ANFE, 2017), only 8% of French OTs hold a Master's degree. Lastly, a relatively high proportion of the respondents in the pre-reform group were involved in teaching (about 25% in initial training, and about 20% in continuing professional training); this seems very high, and might mean that these individuals were more aware of EBP. Lastly, our decision to collect data through self-reporting may also constitute a source of bias, since Snibsøer et al. (2018) found that levels of self-reported knowledge in EBP were higher than levels of assessed knowledge ($p < 0.001$). It would therefore be interesting to more formally observe the use of EBP among healthcare professionals having been trained under the new curriculum.

Implications for research and practice

Our results raise questions about the institutional and organisational aspects of an economic system in which only the time directly spent with the patient is valued. It might be useful to study whether line managers include EBP in the annual objectives that they define with their teams, both on an individual and institutional level.

Our results also raise questions about how and when to teach EBP during the initial training: is EBP understood to be real way of working or just as a form of academic knowledge needed to pass an exam and then forgotten?

Lastly, our results raise questions about continuing professional education for nurses and OTs. Following implementation within the university system, both professions can now follow Master's degrees after their initial training. It is noteworthy that in the post-reform

group, 1% of the nurses and 6% of the OTs had gained a higher degree between one and five years after the end of their initial training. Hence, the debate over continuing professional education for allied healthcare professionals in France (including training in EBP) is more relevant than ever. This change has already started for nurses, who have been able to access nurse practitioner training courses since September 2018.

Conclusion

Evidence-based practice has evolved since it was first defined. Most allied health professionals are now aware of the importance of EBP, and this approach is now embedded in the recently reformed initial training courses for allied health professionals in France. However, it appears that the implementation of EBP by allied health professionals is low and has not increased following the curriculum reform. Our results notably raise questions about (i) how healthcare organizations can be improved on the national level, and (ii) how managerial practices and initial training can be improved with a view to enhancing the use of EBP in routine practice.

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Tables

Table 1: Demographic and practice characteristics in the overall study population and the pre- and post-reform groups

	Total (n=595) n (%), unless otherwise indicated	Pre-reform group (n=301) n (%), unless otherwise indicated	Post-reform group (n=294) n (%), unless otherwise indicated	p value*
Sex				
Female	511 (85.88)	258 (86.29)	253 (86.05)	0.934
Age				
Median	56.00 [30-40]	39.00 [33-49]	25.00 [24-28]	<0.001
Range	(21-71)	(24-71)	(21-48)	
Other degree				
Specialist nurse (child care, anaesthetist or scrub nurse)	17 (2.86)	15 (4.98)	2 (0.68)	0.002
University degree	116 (19.50)	102 (33.89)	14 (4.76)	<0.001
Healthcare manager	21 (3.53)	21 (6.98)	0 (0.00)	<0.001
Master's degree	96 (16.13)	77 (25.58)	19 (6.46)	<0.001
PhD	5 (0.84)	4 (1.33)	1 (0.34)	0.373
Coordinator nurse	16 (2.69)	16 (5.32)	0 (0.00)	<0.001
Other	21 (3.53)	9 (2.99)	12 (4.08)	0.471
Profession				
Occupational therapist	289 (48.57)	125 (41.53)	164 (55.78)	0.001
Nurse	298 (50.08)	170 (56.48)	128 (43.54)	
Podiatrist	8 (1.34)	6 (1.99)	2 (0.68)	

* a chi-squared test or Fisher's exact test (except for age, where Student's t test was applied).

Table 2: Reading habits in the pre- and post-reform groups

	Total N=595 n (%)	Pre- reform group N=301 n (%)	Post- reform group N=294 n (%)	p*	OR_{post-reform} adjusted for a Master's degree [95%CI]	p* adjusted for a Master's degree
Reads professional literature more than once a month	259 (43.5)	163 (54.2)	96 (32.7)	<0.001	0.52 [0.37-0.73]	<0.001
Reads international literature more than once a month N=562/n=273/n=289	49 (8.7)	39 (14.3)	10 (3.5)	<0.001	0.31 [0.15-0.66]	0.002
Reads professional literature less than twice a year	76 (12.8)	28 (9.3)	48 (16.3)	0.01	1.63 [0.98-2.70]	0.06
Uses the library more than once a month	63 (11.3)	34 (12.4)	29 (10.3)	0.42	0.90 [0.52-1.56]	0.72

Visits official websites more than once a month N=571/n=286/n=285	189 (33.1)	116 (40.6)	73 (25.61)	<0.001	0.63 [0.43-0.91]	0.014
Participates in journal clubs more than once a month N=524/n=252/n=272	35 (6.7)	18 (7.1)	17 (6.25)	0.683	0.88 [0.43-1.80]	0.733

* a chi square test or Fisher's exact test and the Wald tests were used for the analysis.

Table 3: Reasons for reading the literature in the pre and post-reform groups

	Total N=595 N (%)	Pre-reform group N=301 N (%)	Post-reform group N=294 N (%)	p*	OR _{post-reform} adjusted for a Master's degree [95%CI]	p* adjusted for a Master's degree
To stay informed about their profession	449 (75.5)	231 (76.7)	218 (74.2)	0.462	0.94 [0.64-1.39]	0.762
To stay informed about the field of practice	490 (82.3)	259 (86.1)	231 (78.6)	0.017	0.66 [0.43-1.03]	0.067
To take clinical decisions	342 (57.5)	172 (57.1)	170 (57.8)	0.867	1.13 [0.81-1.58]	0.478
To write an article	59 (9.9)	51 (16.9)	8 (2.7)	<0.001	0.21 [0.09-0.46]	<0.001
For studies (dissertations, etc.)	98 (16.5)	76 (25.3)	22 (7.5)	<0.001	0.33 [0.19-0.55]	<0.001
To prepare oral presentations	128 (21.5)	102 (33.9)	26 (8.8)	<0.001	0.24 [0.15-0.38]	<0.001
To tutor trainees	195 (32.8)	107 (35.6)	88 (29.9)	0.145	0.85 [0.59-1.21]	0.364
To supervise students for their final dissertation	91 (15.3)	73 (24.3)	18 (6.1)	<0.001	0.27 [0.156-0.48]	<0.001
To share during informal discussions	239 (40.2)	127 (42.2)	112 (38.1)	0.308	0.93 [0.66-1.31]	0.675
To share during formal meetings	68 (11.4)	41 (13.6)	27 (9.2)	0.089	0.79 [0.46-1.36]	0.4
Because they feel encouraged by their peers	36 (6.1)	18 (6.0)	18 (6.1)	0.942	0.99 [0.49-1.99]	0.979
Because they feel encouraged by their line managers	26 (4.4)	13 (4.3)	13 (4.4)	0.951	1.01 [0.45-2.29]	0.972

* a chi square test or Fisher's exact test and the Wald tests were used for the analysis.

Supporting information for review and online publication only

Table 4: Barriers to reading mentioned by the pre- and post-reform groups

	Total N=595 n (%)	Pre- reform group N=301 n (%)	Post- reform group N=294 n (%)	p*	OR _{post-reform} adjusted for a Master's degree [95%CI]	p* adjusted for a Master's degree
Lack of time	487 (81.9)	236 (78.4)	251 (85.4)	0.027	1.59 [1.03-2.47]	0.037
Lack of access to resources	274 (46.0)	131 (43.5)	143 (48.6)	0.21	1.22 [0.87-1.70]	0.245
Does not really see the point	4 (0.7)	0 (0.0)	4 (1.4)	-	-	-
Language barrier	238 (40.0)	148 (49.2)	90 (30.1)	<0.001	0.40 [0.28-0.57]	<0.001
Not encouraged/acknowledged	119 (20.0)	66 (21.9)	53 (18.0)	0.234	0.79 [0.52-1.20]	0.272
No barriers	41 (6.9)	26 (8.6)	15 (5.1)	0.089	0.62 [0.31-1.23]	0.169

* a chi square test or Fisher's exact test and the Wald tests were used for the analysis.

Table 5: Current and wished-for levels of access to literature in the pre- and post-reform groups

	Total N=595 n (%)	Pre- reform group N=301 n (%)	Post- reform group N=294 n (%)	p*	OR _{post-reform} adjusted for a Master's degree [95%CI]	p* adjusted for a Master's degree
Has access to a library	184 (30.9)	104 (35.6)	80 (27.2)	0.053	0.77 [0.53-1.11]	0.158
Wishes to have greater access to a library	307 (51.6)	146 (48.5)	161 (54.8)	0.127	1.21 [0.87-1.69]	0.258
Asked for access to a library	28 (4.71)	18 (6.0)	10 (3.4)	0.138	0.58 [0.25-1.30]	0.184
Has access to articles	210 (35.3)	113 (37.5)	97 (33.0)	0.246	0.92 [0.65-1.31]	0.656
Wishes to have greater access to articles	307 (51.6)	144 (47.8)	163 (55.4)	0.064	1.28 [0.92-1.79]	0.141
Asked for access to articles	36 (6.1)	23 (7.6)	13 (4.4)	0.1	0.59 [0.29-1.21]	0.152
Has access to journals	239 (40.2)	143 (47.5)	96 (32.7)	<0.001	0.54 [0.38-0.76]	<0.001
Wishes to have greater access to journals	257 (43.2)	102 (33.9)	155 (52.7)	<0.001	2.15 [1.53-3.03]	<0.001

Asked for access to journals	66 (11.09)	37 (12.3)	29 (9.9)	0.346	0.83 [0.49-1.43]	0.508
Has access to human resources	151 (25.4)	90 (29.9)	61 (20.8)	0.01	0.68 [0.46-1.00]	0.052
Wishes to have greater access to human resources	289 (48.6)	131 (43.5)	158 (53.7)	0.013	1.45 [1.04-2.02]	0.029
Asked for access to human resources	27 (4.5)	15 (5.0)	12 (4.1)	0.597	0.93 [0.41-2.11]	0.865

** a chi square test or Fisher's exact test and the Wald tests were used for the analysis.*

The full original questionnaire (in French) is available online at <https://forms.gle/FUMhKNDNcFpqkfGF6>.

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