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Impacts of an online asynchronous continuing professional development toolkit supporting primary care nurses to engage in shared decision-making: a single-group pre-post study

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Abstract

Background Shared decision-making (SDM) is central to person-centred care and professional nursing practice. Some primary care nurses must become more comfortable and prepared to use SDM in their practice, especially with patients having complex care needs.

Methods We conducted a single-group pre-post study with primary care nurses to assess the relevance and impacts of the online continuing professional development (CPD) toolkit. Using the *New World Kirkpatrick* model, we assessed the toolkit's relevance (level-1, reaction) and nurses' confidence and commitment (level-2, learning). We collaborated with the virtual community of practice for nurses in family medicine groups in Quebec to reach out to as much nurses as possible. We sent hard copies of the toolkit to 42 primary care establishments. We used descriptive statistics and the student *t*-test to treat quantitative data and analyzed open-ended questions with qualitative content analysis.

Results One hundred sixty-five nurses used the toolkit, and 69 completed the pre- and post-training survey. Most were female (94.2 %), aged between 31–45 years old (55.1 %), and held a first university degree (91.3 %). Ninety-six percent (96 %) agreed or strongly agreed that the toolkit would improve their practice. The toolkit significantly increased nurses' confidence ($p \leq 0.001$) and intention ($p \leq 0.01$) to engage in SDM with patients having complex care needs. Nurses appreciated the relevance of video vignettes and accessibility, amongst others.

Conclusions Primary care nurses felt better able to include SDM in their practice with patients with complex care needs and understand their roles better. A CPD toolkit by and for primary care nurses is relevant and increases learning.

Keywords Shared decision-making, Continuous professional development, Patient-centered care, Nurse, Education, Primary care, Case management, User-centered design, Toolkit

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Introduction

Shared decision-making (**SDM**) is an evidence-based process aiming to balance power between healthcare professionals and patients by 1) providing patients with the information they need to make informed decisions about their care that affect their well-being [1–4], 2) allowing healthcare professionals, including primary care nurses, to explore patients' values and needs [5] and present each therapeutically reasonable option's potential risks and benefits when there is equipoise [6]. Equipoise refers to the moment when different options are associated with equal risks and benefits according to current research results and the experts' opinions [7]. SDM provides positive behavioural and health outcomes for patients, such as improving well-being and decision quality, as well as reducing inappropriate use of services [5, 8, 9]. Although SDM improves job satisfaction [10, 11] and is not more time-consuming [12], some healthcare professionals, including primary care nurses, still do not include SDM in their practice [13, 14]. Several barriers contribute to the gap between nurses' current and potential involvement in SDM [11, 15–19]. The variability in the professional practice and the lack of adequate training and skills [5, 17, 20] may explain their discomfort integrating SDM [21, 22]. Using SDM with patients with complex care needs is even more challenging for some nurses [9, 13]. For some of those patients, the simultaneous presence of psychological or social issue, in addition to other physical ailments, contributes to complex situations that interfere with usual care and leads to unmet health and social needs [23]. They face multiple and sometimes complex decisions throughout their healthcare pathways and transitions [13]. Since SDM is essential to patient-centred care and is not included in primary care nurses' initial education, continuing professional development (**CPD**) must provide for this training need.

CPD refers to a process used throughout a career that focuses on the needs of a professional and is used to acquire knowledge and skills [24]. CPD is more relevant than ever as the practice is increasingly complex, constantly evolving, and as new knowledge is continually growing [24]. However, like many other professionals, primary care nurses represent a large workforce spread over a wide area [25, 26]. In Quebec, Canada, there are over 74,000 registered nurses, and 16 % work in community services, including primary care [27]. Based on previous works by Poitras [28], when accounting for an average of two nurses for each of the 452 primary care practices in the province [29], we estimate the number of nurses in primary care to be around 900. It is currently challenging to train many professionals efficiently. In addition, CPD programs must be inexpensive [24], require little time investment by the primary care nurses to minimize the impact on their clinical activities and work-life balance [30–32], and must be easy to implement on a large scale [33, 34]. We must innovate and find new strategies to train primary care nurses. One of the strategies that meet these conditions is online information technology which, in addition, is usually effective in translating health-related knowledge [35]. A few online CPD programs exist to improve SDM, among others. However, only some are aimed at primary care nurses [6], and few have proven effective in changing practice [6, 36]. Most of these programs need to be adequately assessed and provide rigorous evidence of their impacts [6, 36]. Failure to do so has led to difficulties in identifying effective strategies and determining the most important components. This lack of assessment leads to ineffective continuing professional development programs that impede continuing education, disengage primary care nurses, and restrain the adoption of good practices in primary care [37].

While some CPD programs impact primary care nurses [38], none are toolkits regarding SDM with patients having complex care needs or launched for a large number of volunteer nurses. Thus, we sought to cocreate, disseminate and assess the impacts of an asynchronous CPD toolkit to support primary care nurses in SDM with patients having complex care needs.

Methods

Study design

We performed a quasi-experimental study to assess the impacts of a CPD toolkit on primary care nurses. We hypothesized that trainees' confidence and commitment would increase after using the toolkit. We tested this hypothesis using a one-group pre-post-study design [39]. We reported data using the Quality Assessment Tool for Before-After (Pre-Post) Studies With No Control Group - Study Quality Assessment Tools.

Creation of the toolkit

A "Creation Committee" composed of researchers, patient partners, research team members, a graphic designer, and healthcare professionals (primary care nurses and physicians), has been set up to align with stakeholders' needs in the field. Patient partners were involved in selecting and revising the toolkit content, and helped create the scenarios of video vignettes. Based on our previous work with healthcare professionals [5, 13, 40, 41] and on the premise that diversified andragogic modalities benefit CPD [42], we decided to create a bilingual (French and English) CPD toolkit to support primary care nurses. Toolkit groups multiple knowledge transfer tools and strategies to train and facilitate behaviour change [43]. The committee iteratively created an andragogic plan including the specific objectives and chosen learning strategies and the delivery methods, as well as the planned knowledge transfer tools, material

needed. We used the SDM model [44, 45], the *Ottawa Decision Support Framework* [46] and the *Knowledge-To-Action* framework [47, 48]. The andragogic plan is presented in Table 1. The global learning objective of the CPD was as follows: Upon completing the training, the primary care nurse will be able to identify the decision points of patients with complex care needs and use a shared decision-making approach. The content of the toolkit was created based on our team's collective knowledge and expertise, and on previous work [13, 49–51]. Our team possesses extensive training and highly recognized expertise in shared decision-making. Notably, one of the authors holds a Canadian Research Chair in this field, while another holds a Canadian Research Chair focused on patients with complex care needs.

A professional production agency has shot the fictitious patients' video vignettes and fictional clinical encounters. The team hired patient partners to play the different roles, and a professional graphic designer created the visual signature of the toolkit. As accessibility and duration are determinants of a successful CPD activity for primary care nurses [52–54], our toolkit was accessible through our website and was asynchronous (https://en.poitraslab.com/formation). The team also developed a walkthrough to simplify the use of the CPD toolkit. The total estimated time to go through the CPD toolkit is one hour.

Dissemination of the toolkit and sampling

The committee designed a dissemination strategy to maximize the spread of the CPD toolkit in collaboration with the National Nursing Directory board. First, the toolkit was launched through a 1-hour webinar on the Quebec virtual community of practice for primary care nurses, as they constitute our target population. Around 650 nurses working in primary care clinics compose this virtual community from which they can access training and counselling from colleagues. Then, we mailed a hard copy of the toolkit and emailed a numeric copy of the toolkit to 42 healthcare directors in establishments governing primary care clinics across the province. We asked them to forward the toolkit to their primary care nurses' staff administrator. We finally launched the toolkit on our social media. In a convenience sampling approach [55], all primary care nurses who used the online toolkit were eligible to provide feedback.

Table 1 Description of the andrological CPD toolkit

Specific objectives	Content items	Andragogic strategies to transfer knowledge
• Acknowledge the reality of patients living with complex care needs • Identify the steps to follow to promote SDM in their approach to care • Use the SDM approach in their consultations with patients.	• Walkthrough • One 8 1/2 × 11 page • 30-minute PowerPoint slideshow narrated by the principal investigator • 3 video vignettes of the patient's perspective of 4 minutes each • 8 minutes video vignette of a clinical encounter • 4 posters 11 × 17 inches and 4 pamphlets 3 ½ X 6 inches presenting verbatims and key messages for SDM	• Link to video clips (Youtube) • Narrated PowerPoint • Link to video clips (Youtube) • References to further reading • Posters • Pamphlets

CPD: Continuous professional development, SDM: Shared decision-making

Data collection

To evaluate the nurses' satisfaction, confidence and commitment to using the toolkit, we used *The New World Kirkpatrick Model* [56, 57]. This model effectively evaluates training activities and is widely used in healthcare [57–60]. Level 1, reaction, was used to assess satisfaction and acceptability of the toolkit, and level 2, learning, was used to measure the confidence and commitment of trainees regarding shared decision-making with patients with complex care needs. To evaluate level 3 [56], "the degree to which a person has formulated conscious plans to perform or not perform some specified future behaviour," we used commitment as a proxy for changes in behaviour [56].

Based on *The New World Kirkpatrick Model* [56, 57] and our previous work [41], we coconstructed a pre- and a post-self-administrated questionnaire (Additional file 1). The links to the questionnaires were provided in the walkthrough, and primary care nurses were invited to complete these online surveys before and after using the toolkit [39, 61]. The before-survey was composed of 11 questions: A) three questions on their socio-demographic characteristics; B) five questions on their professional background; C) one question on their attendance at the official launch of the toolkit; D) one 4-Point Likert scale question assessing their level of confidence about their competency in three elements of shared decision-making with patients with complex care needs and; E) one 10-Point Likert scale question to assess their commitment to using their learning.

The after-survey included nine questions: A) one question about their professional background; B) two questions about their socio-demographic characteristics; C) one 5-Point Likert scale question about their satisfaction regarding the toolkit; D) one 4-Point Likert scale question assessing their level of confidence about their competency in three elements of shared decision-making with patients with complex care needs; E) one 10-Point Likert scale question to assess their commitment to using their learning and; F) two open-ended questions to assess their perception of the CPD toolkit (e.g.: What have you enjoyed the most?) and to propose suggestions to

improve the toolkit. We also gathered general comments [56].

We collected data anonymously, then used two questions to generate a unique identifier to pair before and after questionnaires: date of birth and the last four digits of their phone numbers.

Indicators of the dissemination strategy

According to the *Guide to Monitoring and Evaluating Health Information Products and Services*, written by Sullivan et al. [62], we measured the success of our dissemination strategy through metrics such as Reach, Use and Usefulness. Reach describes the extent to which information is distributed toward organizations and individual users, and then redistributed. Use is how trainees learn and how the product is applied to implement changes. Usefulness answers the question: is the product appropriate, applicable and practical? This last component includes user satisfaction, quality, innovation, and relevance. Table 2 outlines the metrics used to measure the relative success of the approach used. We selected the right indicators for each model component to ensure global monitoring of our CPD toolkit [63].

Table 2 Indicators of the dissemination strategy based on the Sullivan et al. Detailed conceptual framework for monitoring and evaluating health information products and services

Metrics	Items	Collection tools	Results
Reach	• Number of toolkits distributed [a]		42
	• Number of toolkits/documents requested following initial distribution[b]	Available information to the research team via logbooks and website reports	6
	• Number of nurses who attended the official webinar launching [a]		132
	• Number of likes, shares and comments on our social media pages about the tools in the kit [c]		115
	• Number of clicks on our social media or posts about the tools in the kit [c]		82
	• Viewing of video vignette [a]		473
Use	• Percentage of nurses who were satisfied with the kit	Self-reported web questionnaires measuring learning, satisfaction, and positive attitude towards toolkit using a 6-point Likert scale	96 %
	• Percentage of nurses who reported a learning gain from the tools in the kit		94 %
Usefulness	• Number of nurses who intend to use the kit (nb who answered between 7 and 10 over 10 to the question)	Self-reported web questionnaires measuring commitment using the 10-point Likert-type toolkit	93 %

a. Primary distribution, b. Secondary distribution, c. Referrals

Data analysis

We performed descriptive analyses with quantitative data to assess the variables' frequency, mean, and standard deviation [64]. We used unpaired and paired-sampled *t*-tests to evaluate the changes between pre- (before the use of CPD toolkit) and post- (after the use of CPD toolkit) surveys [65] and calculated 95 % confidence intervals (95 % CI) [66]. We also performed subgroup analyses to identify factors influencing levels 1 and 2. We conducted statistical analyses using SPSS software (version 24), and a p-value lower than 0.05 was considered statistically significant [65, 67]. A research coordinator trained in qualitative analysis performed a thematic inductive analysis with answers to the open-ended questions. Qualitative data aimed to refine the interpretation of the quantitative data. We analyzed knowledge transfer metrics using descriptive statistics [64].

Ethics approval and consent to participate

The ethics committee of Centre intégré universitaire de santé et de services sociaux du Saguenay-Lac-Saint-Jean examined the study protocol and stated that no ethical approval was needed. Indeed, this study is aimed at quality improvement and used exclusively for assessment, management, or improvement purposes; it does not constitute research for the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans [68]. As a result, the ethics committee of Centre intégré universitaire de santé et de services sociaux du Saguenay-Lac-Saint-Jean stated that a signed consent form (i.e. explicit consent) was not required, and implicit consent was sufficient. This implicit consent was obtained by the participants since they chose to answer the questionnaire online. Professional nursing organizations and social networks offered the toolkit. Completing the questionnaires was voluntary; the research team did not approach or even contact a potential respondent. We collected data anonymously and all methods were carried out in accordance with relevant guidelines and regulations.

Results

Indicators of the dissemination strategy

The official launch of the CPD toolkit on the virtual community of practice reached 132 primary care nurses. Among them, 59 (45 %) completed the pre-survey, and 24 (41 %) completed the post-survey. The remaining 106 primary care nurses who completed the pre-survey did not attend the webinar, and therefore, were reached through

our social media or through the toolkits sent to the 42 healthcare establishments governing primary care clinics across the province.

Primary care nurses who use our CPD toolkit

165 primary care nurses completed the pre-survey and 79 (60 %) completed the post-survey. The matching between the pre- and post-surveys was impossible for 10, so we performed analysis with 69 (41 %) pairs. Most primary care nurses were female (95 %) aged between 31 and 45 (59 %). More than 96 % were registered nurses, 2 % were practitioner nurses in a primary care clinic, and one in two nurses had been in their position for less than five years. Table 3 presents the complete characteristics of the primary care nurses enrolled in the study.

Level 1 – reaction

Of the 83 primary care nurses who completed the post-survey, 77 (96 %) agreed or strongly agreed that the toolkit would help them improve their practice and that it was a success. Some primary care nurses said that the toolkit had updated their knowledge:

Table 3 Socio-demographic characteristics of the study's primary care nurses

Socio-demographic characteristics	Nurses who completed the baseline survey (N = 165)		Nurses from the 165 who also completed the final survey (N = 69)	
	Frequency		Frequency	
	N	%	N	%
Gender				
Female	156	94.5	65	94.2
Male	7	4.2	3	4.3
Non-binary	2	1.2	1	1.4
Age [a]				
30 and under	17	10.3	8	11.6
31–45	97	58.8	38	55.1
46–60	48	29.1	22	31.9
61 and over	2	1.2	1	1.4
Education level				
Nurse	4	2.4	1	1.4
1st university degree	136	82.4	63	91.3
2nd university degree	24	14.5	5	7.2
3rd university degree	1	0.6	0	0
Position in primary care clinic [b]				
Registered nurse	159	96.3	67	97.1
Nurse practitioner	3	1.8	2	2.9
Number of years in this position				
< 1 year	29	17.6	5	7.2
1–5 years	67	40.6	32	46.4
6–10 years	45	27.3	18	26.1
> 11 years	24	14.5	14	20.3

a: 1 nurse did not answer the question, b: 3 nurses did not answer the question

"I notice that I often leave out the post-decision discussion (checking the patient's comfort with the decision)."

The toolkit met the primary care nurses' expectations for 92.5 %, and 94 % felt able to apply what they learned.

> *I had heard the topic of shared decision-making many times before, but never presented so clearly, [the toolkit] makes you want to apply it confidently.*

The primary care nurses generally appreciated the toolkit as expressed by these citations:

> *Toolkit very relevant to my practice and really appreciated, thank you.*
> *Very interesting and dynamic training.*
> *Well done, and thank you for developing this kind of tool.*

The primary care nurses mostly appreciated the toolkit's short duration, concision, and concrete examples of patients' stories. They also enjoyed the reference documents and tools provided, which they can use to apply what they have learned, as explained by these primary care nurses:

> *Clear [presentation], references and resources well identified to continue my update.*
> *The tools are available to help our patients. It is more concrete and allows us to translate the concepts into practice.*

The strong points of the toolkit were 1) the concision of the PowerPoint slideshow narrated by the principal investigator, 2) the well-structured and explained toolkit, 3) the relevant clinical video vignettes, 4) the helpful reference documents and tools provided, 5) the clarity and popularization, 6) the multiple practical examples used, 7) the talented actors and professional-level video vignettes, and 8) the easily accessible, free, online and asynchronous setting of the training. The points for improvement reported by the primary care nurses were 1) adding an interactive quiz, 2) providing additional clinical examples, 3) adding a counterexample of inadequate SDM, and 4) adding a simulation exercise.

Level 2 - learning

Results from unpaired t-tests comparing the 165 pre-surveys and the 79 post-surveys showed statistically significant improvements in the three measured items about their competencies on shared decision-making with patients with complex care needs (Additional file 2A). Primary care nurses' commitment to applying learning was high according to pre-surveys (8.65 ± 1.58)

and remained elevated after using the toolkit (9 ± 1.21, p = 0.107) (Additional file 2B).

As shown in Fig. 1, paired T-tests (n = 69) reveal that the level of confidence significantly increases for the three measured items about competencies on shared decision-making: assessing decision-making needs (2.41 ± 0.58 vs 3.13 ± 0.62, p < 0.001), supporting patients in shared decision-making (2.39 ± 0.62 vs 3.16 ± 0.59, p < 0.001) and understanding their role and the patient's role in shared decision-making (2.55 ± 0.61 vs 3.41 ± 0.55, p < 0.001). Moreover, commitment to apply learning from the CPD toolkit increases despite a high pre-score (8.43 ± 1.96 vs 8.97 ± 1.22, p = 0.009). The observed increase in the confidence level is more significant in the subgroup aged between 31 and 45: assessing decision-making needs (2.32 ± 0.58 vs 3.05 ± 0.66, p < 0.001, Fig. 2A), supporting patients in shared decision-making (2.26 ± 0.55 vs 3.11 ± 0.61, p < 0.001, Fig. 2B) and understanding their role and the patient's role in shared decision-making (2.45 ± 0.56 vs 3.39 ± 0.55, p < 0.001, Fig. 2C). For the level of commitment in applying learnings from the CDP toolkits, the increase appears significant only in the subgroup aged between 46 and 60 (n = 32, p = 0.019, Fig. 2D). On the other hand, we looked at the effect of attending the launching webinar on confidence and commitment levels. Primary care nurses who did not participate in (n = 44) the launching webinar had the highest increase in the level of confidence to assess patients' needs for SDM (2.27 ± 0.59 vs 3.11 ± 0.66, p < 0.001) compared to those who did (n = 25). We also observed a significant increase in commitment to apply learnings from the CPD toolkit for primary care nurses who did not attend the launching webinar (8.5 ± 2.04 vs 9.14 ± 1.17, p = 0.03). In contrast, it was not significant for those who did attend the webinar (8.32 ± 1.84 vs 8.68 ± 1.258, p = 0.13) (Additional file 3).

Discussion

In this quasi-experimental study, we created, disseminated, and evaluated a continuing professional development toolkit to support primary care nurses in shared decision-making with patients with complex care needs. We found that a substantial and diversified dissemination strategy and partnership with a virtual community of practice is effective in reaching many nurses across a wide area. This study also showed that primary care nurses appreciate online asynchronous toolkits for their CPD. Post-surveys revealed that 96 % of the primary care nurses expressed that the CPD toolkit was successful. Our results also provide evidence supporting a significant positive impact of the CPD toolkit on primary care nurses' learning (confidence and commitment) to engage in SDM. These results led us to the following observations.

First, the CPD toolkit and our dissemination strategy efficiently reached primary care nurses in multiple clinical settings spread over a wide area. The collaboration with a national virtual community of practice, which is a social network of individuals allowing crossing geographical boundaries [69, 70], may facilitate the dissemination of the toolkit [71]. Virtual communities of practice efficiently support clinicians to improve their practice, share knowledge [35] and implement evidence-based practice [72, 73], bridging the gap between research and clinical settings [74]. It allowed reaching 132 primary care nurses simultaneously [75] and provided a high engagement in the CPD toolkit, since 69 answered the pre-survey. Social media is an effective way to reach nurses for

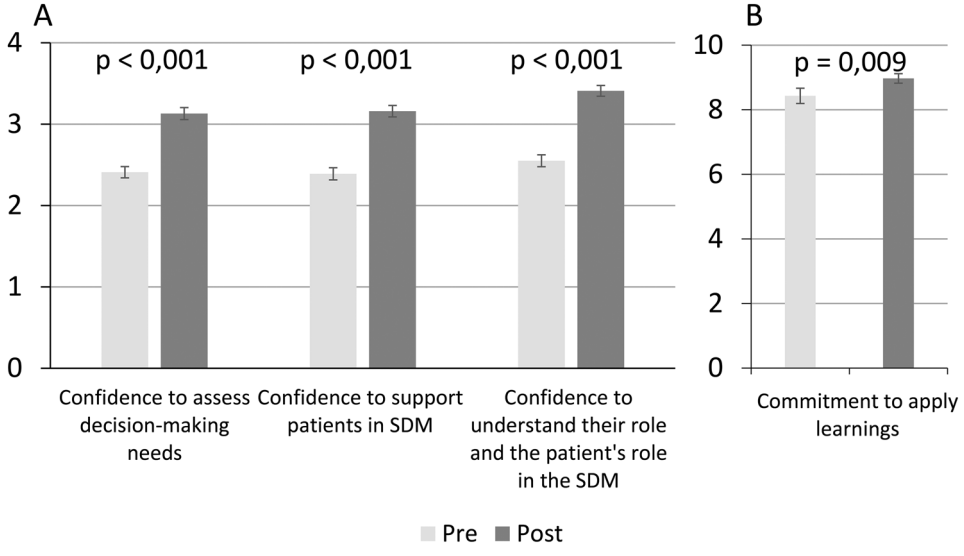

Fig. 1 Impacts of the toolkit on confidence (**A**) and intention (**B**) of primary care nurses. Impacts of the toolkit on confidence (**A**) and intention (**B**) among primary care nurses who completed the pre- and post-surveys. Paired T-tests were performed (n = 69). SDM: shared decision-making

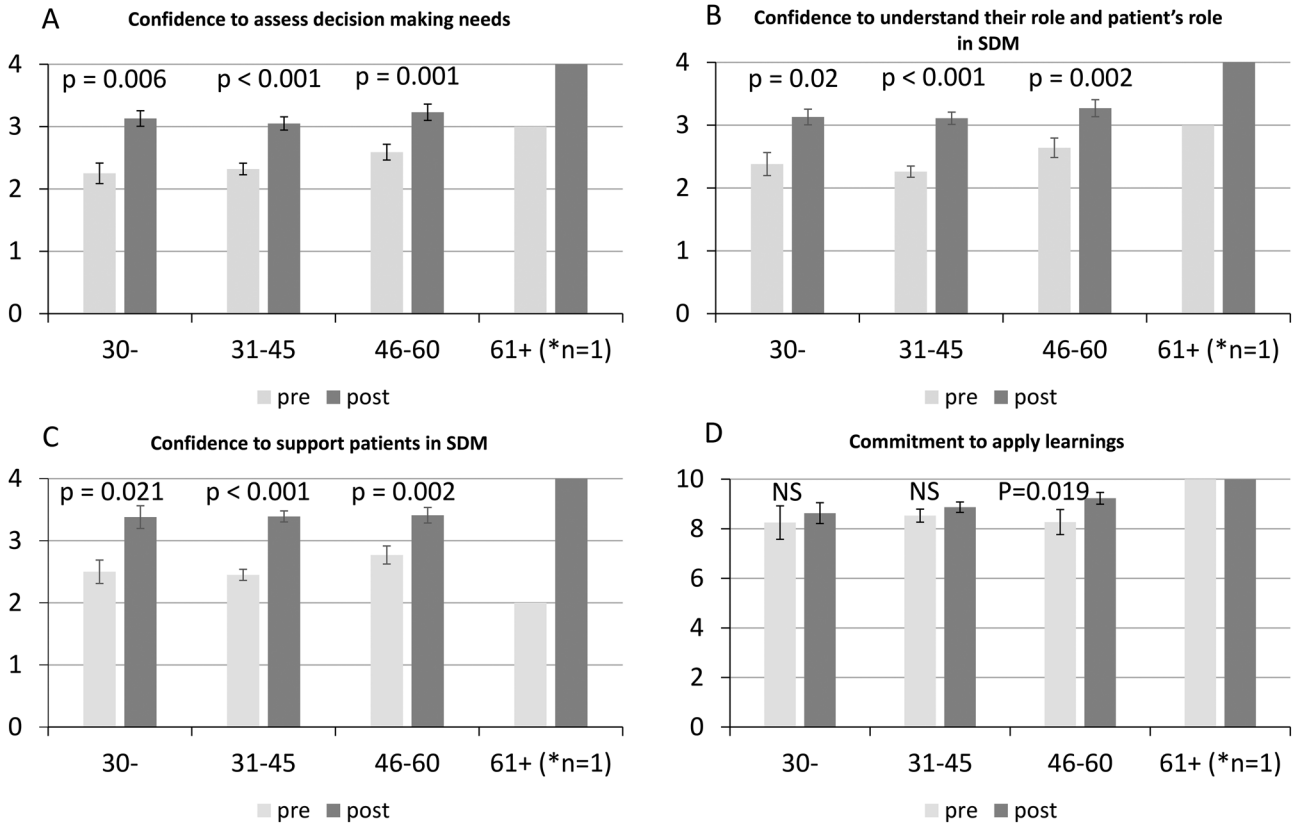

Fig. 2 Impacts of the toolkit on confidence (**A**) and intention (**B**) of primary care nurses based on their age group. Impacts of the toolkit on confidence (**A**-**B**-**C**) and commitment (**D**) in the different aged subgroups of primary care nurses who completed the pre- and post-surveys. **A**. Confidence to assess decision-making needs. **B**. Confidence to understand their role and the patient's role in SDM. **C**. Confidence to support patients in shared decision-making (SDM). **D**. Commitment to apply learnings from the continuous professional development toolkit

professional development and even more for learning and clinical skills development [76]. Social media offer learning opportunities [77] and should be used more in promoting CPD [77]. The asynchronous mode must have contributed to reaching more nurses as they could use the toolkit whenever possible [34]. Less than a half of the 165 primary care nurses who completed the pre-survey also completed the post-survey. This proportion confirms similar response rates for web-based surveys in other studies [78–80]. Interestingly, nurses who did not attend the launching webinar had significantly more commitment to applying learning than those who did. Their voluntary commitment to seek out and complete the CPD toolkit may have contributed to this higher commitment.

Free access [77] to the CPD toolkit and the walk-through divided into activities [81–83] allows the primary care nurses to carry them out at their own pace and according to their goals [53]. the variability of offered tools contributes to its success. The primary care nurses appreciated the CPD toolkit's flexibility, which allows them to adjust CPD activities to fit into their schedules, which is consistent with the literature [82, 84]. Also, as a lack of information technology competence can impede primary care nurses from completing CPD activities [85], the online CPD toolkit was as easy to use as possible. In addition, the training was built to be asynchronous rather than adapted from a face-to-face delivery [34], which is consistent with the best online training practices [24]. We based the CPD toolkit on high-quality evidence [42], and each component had a rationale [48], which may also have contributed to its success.

Patient-oriented trainings providing concrete and contextualized tools that primary care nurses can use in their practice after completing the CPD activities improves their motivation and engagement [86, 87]. As reported in the literature, high applicability and relevance increase engagement and motivation, which are key factors in optimizing the impact of CPD on primary care nurses [22, 52]. The CPD toolkit successfully improved the learning of primary care nurses [88, 89]. According to the literature, several toolkits are available for nurses [90, 91], and the few authors that assessed their toolkits reported positive outcomes on nurses' learning. Other CPD programs or toolkits are available for Canadian nurses [92, 93]. Some require payment or a subscription, while others are accredited, with varying durations. Universities or

professional organizations have developed most of these, and we have not identified any designs by research teams that have been made freely available online and addressing shared-decision making. Our CPD toolkit stands out as it includes a multimodal approach with various andragogical strategies and is targeted at primary care nurses. Our CPD toolkit was also developed in collaboration with patient partners, who contributed to content creation and to the filming of educational video segments—a uniquely distinctive approach.

Next, our CPD toolkit showed different results in increasing the learning of primary care nurses according to their age. It seemed more efficient for nurses between 31 and 45 years old. However, their higher proportion in the sample may explain a part of this result. Nevertheless, the literature is contradictory regarding the influence of nurses' age on their use of technology [94, 95]. Also, subgroup analysis showed higher p values for all measured elements for the primary care nurses under 30 years. These findings should be interpreted cautiously as the sample size of primary care nurses aged 30 and younger was eight. This may not have been sufficient to detect a significant difference in the items measured at pre- and post-surveys. Nonetheless, this finding aligns with the literature [96–98], revealing that older nurses were more likely to keep up to date and complete CPD activities. On the other hand, since young nurses' initial training is more recent, they may feel less need for such training. The nurses' workforce is composed of different age groups [96], with different skills and professional development needs [99–101], which can also influence their learning. To maximize the impacts, CPD activities developers must heed the targeted trainees' age in designing their activities.

By creating a toolkit to equip nurses better in using shared decision-making, we are contributing to the improvement of patients' and nurses' experience, as an effective SDM enhances patient outcomes [9], strengthens relationships between the clinicians and the patient, and fosters collaboration by aligning care plans with patient goals and needs while promoting continuous learning through meaningful dialogue [102, 103]. In addition, it may be a first step toward using other shared decision-making strategies that could be implemented, such as using decision aids. Decision aids improve knowledge, reduce conflict, and increase patient and professional satisfaction [104].

Strengths and limitations

A sample size of 199 participants would have been required to detect a small effect size (0.2), sufficient to yield clinically significant impacts with 80 % power. Although the sample size is limited, the participants included in the study are representative of the target population. Furthermore, the matched participants provided reliable data on the observed changes. Even small changes may hold practical or clinical significance, warranting further consideration and investigation [105]. Since the nurses were not directly engaged in a research study, completing the pre- and post-surveys may not have been considered important.Eventough we asked primary care nurses about their participation in the official launching webinar, there were no questions about the other dissemination strategies among social media, word-of-mouth, and healthcare establishments governing primary care clinics across the province. So, we cannot conclude which was most effective in reaching them. As we did not use a control group in our quantitative evaluation of level 2 of the *New World Kirkpatrick* model, some external bias could influence the outcomes of the toolkit. We also do not conduct repeated measures post-training to evaluate level 3 of the *New World Kirkpatrick* model about how the CPD toolkit may lead primary care nurses to change their practice and assess its sustainability. Therefore, the clinical impacts of the CPD toolkit could only be hypothesized.

Conclusions

In conclusion, our study suggests that the online CPD toolkit increases the confidence and commitment of nurses to engage in SDM with patients with complex care needs. Our results indicate that an online CPD toolkit efficiently transfers research evidence to primary care nurses and supports using various tools and andragogic methods in CPD. An online toolkit is a potential format for ongoing development by professional organizations, governing nurses and health care professionals. Research teams should also use this agile and straightforward format to transfer knowledge to potential users.

Abbreviations

CPD Continuous professional development
SDM Shared decision making

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Authors' contributions

M-EP is the lead of this study and was involved in all phases of it and contributed to the writing of the manuscript. VTV, PB and MG acquired, analyzed, interpreted the data, and drafted the manuscript. AB, KP, and AP were involved in the design of the andragogical material and revised the manuscript. PP, MB, FL, M-CC and CH were involved in the study design and the andragogical material and revised the manuscript.

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Data availability
The datasets generated and analyzed during the current study are not publicly available due to local policies but are available from the corresponding author upon reasonable request.

Declarations

Ethics approval and consent to participate
As this study is a quality improvement one used exclusively for assessment, management, or improvement purposes, it does not constitute research for the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans.

Consent for publication
Not applicable.

Competing interests
The authors declared no conflicts of interest.

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