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# Characterizing users and intention to use online health information resources: A comprehensive study

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## 1. Introduction

### 1.1. Background

High needs for accessible scientific health information for the public translate into increased online information-seeking behaviour [1,2] and is particularly common among people with chronic diseases [3–5]. Vascular diseases are widespread chronic diseases, increases in prevalence with age [6] and is one of the leading causes of loss of quality of life and death worldwide [7]. It includes high blood pressure, kidney disease, arterial and venous disease, cerebrovascular and cardiovascular disease, and diabetes. The Quebec Society of Vascular Sciences (QSVS), a non-profit scientific organization and interdisciplinary forum for health professionals for more than 20 years, has responded to this need. In 2019 they have created a web Portal (https://yourvascularhealth.ca), aimed at the general public. This online health information resource (OHIR), created thanks to the work of a number of health professionals supported by an IT team, promotes vascular health by focusing on risk factors such as obesity, smoking, physical exercise, diet, and management of vascular diseases. Yet, there is limited data when it comes to describing the characteristics of users of OHIR, particularly the older adult [8,9]. What's more, given that the prevalence of chronic diseases is higher in the elderly [6], it might be expected that older people would make greater use of OHIR(2). However, the available data tend to show an inverse relationship between age and general use of OHIR [9–15]. One of the factors put forward to explain this inverse relationship is that older people may be less likely to have digital skill [16,17]. According to a survey of 14,000 American adults in 2022, nearly 60 % of adults use OHIR, but only 36 % of people aged 75 and over do so [18]. However, the data can be qualified in this respect. In fact, a meta-analysis about technology acceptance by older people, which included 35 studies [19], found that the moderating effects of age on technology acceptance were complex and not simply negative or positive. The authors suggest that future research needs to adopt a multidimensional approach in order to accurately determine the true influence of age on technology acceptance. On another note, some evidence suggest that gender may have some impact on OHIR consultation, women would be more likely to use OHIR than men [2,13,20,21].

In addition to characteristics, in order to learn more about OHIR users, it is also relevant to understand the factors that determine the use of OHIR. The Technology Acceptance Model (TAM) [22] is one of the most widely used models for understanding the behavioral intentions of users of digital tools [23]. TAM subsequently evolved through TAM II [24], UTAUT [25], and then TAM III [26]. Based on the cognitive theory of reasoned action [27], this model suggests that the main variables perceived usefulness (PU) and perceived ease of use (PEOU) mediated by other co-variables will influence users' intention to use or adopt a new system or technology [26]. PU refer to the degree to which a person believes that using a particular system or technology would enhance his or her performance. In this sense, with regard to the consultation of an OHIR, we might expect that the more a population is affected or concerned by a health problem, the more they should perceive the usefulness of an OHIR dealing with that problem. PEOU refer to the degree to which a person believes that using a particular system or technology would be free of effort. PEOU is certainly related to the digital skills of the users. Indeed, in order to have a perceived ease of use, there must be a match between the level of complexity in using OHIR and the digital skills of the target users. The TAM III is the preferred framework for better understanding the factors that determine OHIR use and is used in this study. Indeed, compared with the original TAM [22], which focused mainly on two concepts - perceived usefulness and perceived ease of use - TAM III provides a much more detailed and nuanced approach.

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Whereas the original TAM [22] indirectly linked external variables to these concepts, TAM III details these concepts in specific determinants. For perceived usefulness, for example, it identifies factors such as the subjective norm and the demonstrability of results. For perceived ease of use, it integrates elements such as computer self-efficacy, perceived external control, computer anxiety, playfulness and perceived pleasure. Moreover, it integrates in a unified way not only the determinants of perceived usefulness (as in TAM II [24] with subjective norm and demonstrability of results), but also those perceived of ease of use (such as self-efficacy, computer anxiety and playfulness).

In brief, the OHIR offer is important and may help to maintain or improve the health of the population by providing information that is both scientific and accessible. However, we don't really know who the users are, why they use it or don't use it, and what factors determine their use. This is particularly true for older people, a key target group for OHIR, who are more likely to suffer from various health conditions. This study, based on TAM III, aims to fill these gaps.

### 1.2. Study objectives

The aims of this study are to.

1) Describe the characteristics of OHIR users including users' practices and skills in using digital tools;
2) Explain the interaction between perceived usefulness, perceived ease of use, TAM III co-variables and intention to use.
3) Describe the perceived facilitators and barriers to the intention to use of OHIR.

## 2. Method

### 2.1. Study design and recruitment of participants

This is a cross-sectional multicenter study using both quantitative and qualitative methodology. To be eligible for the study, participants had to be 18 years of age or older, affected by, at risk of, or concerned about their vascular health. Participants needed to have a sufficient understanding of French or English to answer an electronic questionnaire and be able to navigate a Web page and communicate via e-mail.

The Centre Intégré Universitaire de Santé et Services Sociaux de l'Estrie-CHU (Université de Sherbrooke) acted as the evaluation center and deliver ethical certification (#MP-31-2023-4912) as did the 13 other participating centers. All participants have signed a consent form for the qualitative phase.

### 2.2. Quantitative phase

#### 2.2.1. Participant recruitment

Participants were recruited by 33 physicians/healthcare professionals from 14 different local health centers from two different provinces in Canada: Quebec (n = 13) and New Brunswick (n = 1) from February to November 2023. To ensure a representative population, quota sampling was initially used. For each recruiting healthcare professional, one of the following six age-gender target groups were assigned: men or women aged 18–64, 65–74 or 75 and over. Thus, during follow-up medical appointments, the healthcare professional, depending on their availability or workload, approached potential participants (targeted age group and gender) using a pre-established script (Appendix A). This stated, among other things, that "*obviously, whether or not you agree to participate in this research project has no influence on the quality of care you will receive here*". If potential participants agreed, they received a card explaining the research project, including the web link for the study. Advertisement was also delivered via the social networks of our partner, the QSVS.

#### 2.2.2. Collection instrument: the questionnaire

To achieve objectives 1 and 2, an anonymous electronic questionnaire (Appendix B) was used. Hosted on the QualtricsXM web platform, designed by the team and based on recognized validated questionnaires and available in French and English, it contains 24 questions measuring 38 variables. Review rounds of the questionnaire within the research team were conducted to reach a final consensus. The questionnaire was then submitted to a dozen people as part of a pilot pre-test. The estimated duration of the questionnaire was 15–20 min, including a consultation period of QSVS Web portal. The following subsections describe the types of data collected and the tools used in the questionnaire to collect them.

*2.2.2.1. Individual characteristics.* For the individual characteristics of the participants (e.g., gender, age, occupation, level of education, and lifestyle habits), excerpts from the Canadian Community Health Survey [28] and the Centre for Canadian Language Benchmarks [29] were used. Health characteristics were also questioned e.g., self-reported presence or absence of different health conditions including vascular related pathologies (comorbidities). These data have enabled to calculate the age-Adjusted Charlson Comorbidity Index (CCI) score [30,31]. The CCI is a method of categorizing comorbidities of patients. Each comorbidity category has an associated weight (from 1 to 6), based on the adjusted risk of mortality or resource use, and the sum of all the weights results in a single comorbidity score for a patient. For each decade after 40 years, a point is added. The higher the score, the more likely the predicted outcome will result in mortality or higher resource use [30]. This allows us to assess whether there is an interaction between the CCI score and the intention to use OHIR.

*2.2.2.2. Skills and habits related to digital tools.* To collect data about digital skills and habits, study on the digital skills of adults in Quebec "NETendances: Les aînés connectés au Québec" [32] was used. Habits related to the use (yes or no) of digital tools and the Internet were assessed. In addition, this section included a question on personal self-assessment of digital competence (SDC), on a scale of 0–10, where 0 means no personal skills and 10 means a very high level of competence (section 2.1.2.4).

*2.2.2.3. Motivations to use the QSVS web portal.* According to Deci & Ryan self-determination theory, there are three types of motivation [33]. Autonomous or intrinsic motivation drives a person to undertake an activity for pleasure. This motivation is caused by a natural interest in the activity. Controlled or extrinsic motivation, on the other hand, stimulates the individual for external reward or to avoid negative effects. Finally, amotivation is the result of very low autonomous and controlled motivation [33]. The different types of motivation to consult the OHIR are evaluated in this project using the 15-item treatment self-regulation questionnaire (TSRQ), which is part of the Health-Care, SDT Questionnaire Packet (consult www.psych.rochester.edu/SDT) and validated by Levesque and collegues [34]. Each of the 15 questions (Q21 from the questionnaire_Appendix B) represents a reason for adopting or changing a health behaviour (to consult the OHIR) and is associated with one of the types of motivation. Responses are given on a seven-point Likert-type scale ranging from 1 (strongly disagree) to 7 (strongly agree). Each motivation results from the average score of the corresponding questions.

*2.2.2.4. Technology acceptance model III.* As part of this project, an adaptation of the questionnaire from the TAM III [26] was used to identify the factors that interact with the intention to use (Behavioral intention (BI)) an OHIR: the QSVS Web portal. Each variables, PU and PEOU and co-variables from TAM III, subjective norm (SN), demonstrability of results (RES), computer self-efficacy (CSE), perceived enjoyment (ENJ), computer anxiety (CANX) and computer playfulness

(CPLAY) (Table 1) were developed using a series of 1–4 questions, with 7-point Likert scales varying from "strongly disagree (1)" to "strongly agree 7)". The value of each variable and co-variable was calculated by averaging the results obtained for the questions associated with each variable. An interaction is expected between the SN and RES covariates and the PU variable, while an interaction is expected between the SDC, CSE, ENJ, CANX and CPLAY covariates and the PEOU variable. In addition, we added the socio-demographic variables of age, gender and CCI score and measured their interaction with both PU and PEOU and the effect on BI (Fig. 1). We have added the co-variable SDC, score from 0 to 10, to the model (Fig. 1, Table 1).

#### 2.2.3. Data analysis

To meet objectives 1 and 2 of this project, descriptive statistics, averages and proportions were used (R software, version 4.3.1). To analyze the interaction effects related to objective 2 and verify the relationships between the different variables (Fig. 1), correlational analyses and logistic regressions were carried out (R software version 4.3.1) by a team of statisticians from Sherbrooke University. Prior to ordinal regression, the residualisation of covariates' was carried out. This involves regressing the covariates on the independent variable to remove shared variance, thus isolating the interaction effect in the ordinal regression. An interaction occurs if the relationship between the predictor and the outcome is dependent on another variable and can be tested by adding a product variable to the model. For each of the TAM III variables, (Table 1), a different interaction term was added into the model. We tested the extent to which the TAM III variables PEU and PU interacted significantly with BI, and whether 7 co-variables interacted significantly with the BI dependent variables. For the PU variable, SN and RES were of interest. For the PEOU variable, SDC, CSE, ENJ, CANX and CPLAY were the variables of interest. BI to use the web Portal were also explained by interaction, but with the addition of three sociodemographic data such as age, gender and CCI score. The level of interaction with BI (use OHIR within one month), expressed as OR (95 % CI) and p-value (significant $\leq$0.05), between the main variables, PU, PEOU, its co-variables and sociodemographic data gender, age and CCI score will be presented. The degree of interaction with BI (use of OHIR within one month) will be reported as Odds Ratios (ORs) with 95 % Confidence Intervals and p-values (significance level $\leq$0.05). To assess the practical significance of these findings, we will discuss the magnitude of the observed effect sizes (ORs) in the context of the study population, highlighting whether differences are likely to have meaningful implications.

### 2.3. Qualitative phase

#### 2.3.1. Focus groups

At the end of the questionnaire, a question (name and e-mail address) was dedicated to inviting participants to take part in the subsequent qualitative phase of the project. In persons focus groups [36] either of 60 min were planned a time later before the end of the recruitment period of the quantitative phase. The aim of those focus groups was to explore participants' points of view, especially facilitators and barriers to use an OHIR (objective 3). Participants were recruited by convenience sampling and 5 to 8 participants per focus groups was targeted, including a trained moderator. All individuals who expressed interest via the questionnaire were invited to participate in the focus groups. The interview grid was developed by the team considering the preliminary result from the quantitative phase. The interview guide (Appendix C) contained 9 questions and was based on the TAM III [26]. Focus groups were recorded and transcribed in verbatim.

#### 2.3.2. Data analysis

An initial line-by-line reading of the verbatim allowed the team (AM, LC, JRB) to common comprehension in the data before the manually coding. An inductive analysis was first performed (JRB, LC) for the identification of the themes, categorization and interpretation using TAM III [26]) and then submit and discuss with the principal investigator for final consensus.

## 3. Results

### 3.1. Quantitative phase: participants' characteristics

A total of 164 participants completed the questionnaire. The mean age was 64.3 $\pm$ 11.7 years and 53.7 % were female (Table 2). Results are presented for all participants and by age group, i.e., under 64, 65–74 and 75+ (Table 2). The 75 and over age group has a lower proportion of university graduates, 21.9 %, than the 65–74 group, 39.3 %, and the under 64 group, 42.1 % ($p < 0.05$). They are also less likely to use tobacco products ($p < 0.05$). On the other hand, their CCI score, 5.4 $\pm$ 1.8, is higher than the 65–74 group, 4.5 $\pm$ 1.3 and the 64 and under, 2.9 $\pm$ 1.6 ($p < 0.05$). The 64 and under had more female participants, 63.2 % vs 50.0 % for the 65–74 group and 37.5 % for the 75 and over ($p < 0.05$). Elsewhere, the 64-and-under age group has a lower proportion of retired people than the older groups, 31.5 % vs 82.1 % for the 65–74 and 87.5 % for the 75 and over ($p < 0.05$) and of people with a reported diagnosis of diabetes 17.1 % vs 33.9 % and 31.3 % for the 65–74 and 75+ respectively ($p < 0.05$). (Table 2).

#### 3.1.1. Digital characteristics, habits and skills

Participants used cell phones (51.7 %), tablets (57.9 %) and in a higher proportion computers (68.9 %) ($p < 0.05$). The 75+ age group used less cell phones and more tablets than other age groups ($p < 0.05$). Half the participants spent between 1 and 3 h on the Internet, with no significant statistical difference between age groups (Table 3).

When it comes to the use of digital functions, the differences between age groups are statistically significant ($p < 0.05$). The younger age groups are more likely than the older age groups to complete various activities related to the use of digital tools like to download or upload files, using a web application for audio or video calls or to post messages in chat forums ($p < 0.05$) (Table 3). About the question on SDC, the 75 and over age group has a lower score, 4.0 $\pm$ 2.8, than the 65–74, 5.3 $\pm$ 2.7, and the 64 and under group, 7.0 $\pm$ 3.0 ($p < 0.05$).

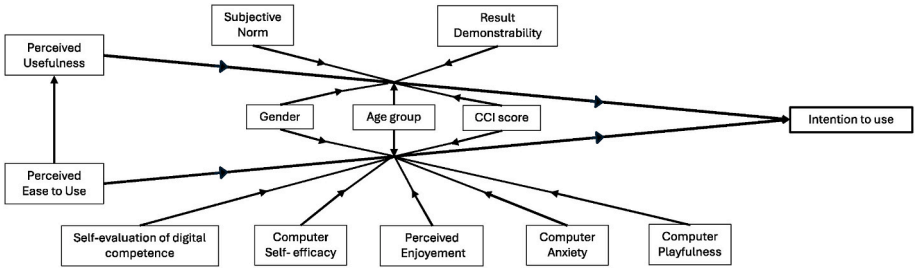


**Fig. 1.** Adaptation of TAM III [20]: variables, co-variables, sociodemographic data and expected interaction with Intention to use (Behavioral Intention).

**Table 1**
Technology Acceptance Model III [26] concepts, definitions and related questions in the questionnaire.

| Concepts[a] | Definition form TAM III [26] | Concepts and related questions in the questionnaire |
|---|---|---|
| Perceived Usefulness (PU) | "*The degree to which a person believes that using a particular system or technology would enhance his or her job*." | PU 1: Using the QSVS web portal improved my efficiency in managing my health.<br>PU 2: I find the QSVS web portal useful in helping me take charge of my health. |
| Perceived Ease to Use (PEOU) | *"The degree to which a person believes that using a particular system would be free of effort."* | PEOU 1: Using the QSVS web portal does not require a lot of mental effort.<br>PEOU 2: I find the QSVS web portal easy to use.<br>PEOU 3: I find it easy to find information on the QSVS web portal. |
| Subjective Norm (SN) | *"The degree to which an individual perceives that most people who are important to him think he should or should not use the system."* | SN 1: People who influence my behavior think that I should use the QSVS web portal.<br>SN 2: People important to me believe that I should use the QSVS web portal.<br>SN 3: In general, those around me encourage the fact that I use the QSVS web portal. |
| Result Demonstrability (RES) | *"The degree to which an individual believes that the results of using a system are tangible, observable, and communicable* [35]*."* | RES 1: I would have no difficulty in mentioning to other people the usefulness of the QSVS web portal.<br>RES 2: I believe that I could inform other people of the consequences of using the QSVS web portal.<br>RES 3: The effects of using the QSVS web portal are obvious to me. |
| Computer Self-Efficacy (CSE) | *"The degree to which an individual believes that he or she has the ability to perform a specific task/job using the computer."* | CSE 1: I can use the QSVS web portal even if there is no one near me telling me where to click.<br>CSE 2: I can use the QSVS web portal if someone showed me how to do it first.<br>CSE 3: I can use the QSVS web portal, as I had used similar web portals before this one. |
| Computer Anxiety (CANX) | *"The degree of an individual's apprehension, or even fear, when she/he is faced with the possibility of using computers*" | CANX 1: Computers do not scare me at all. I'm not afraid to use a computer or a tablet.<br>CANX 2: Using with a computer or tablet makes me nervous.<br>CANX 3: Using a computer or tablet makes me uncomfortable.<br>CANX 4: Computers make me feel uneasy. |
| Computer Playfulness (CPLAY) | "*… the degree of cognitive spontaneity in microcomputer interactions*" | How well do the following characteristics represent me when using a computer or tablet:<br>CPLAY 1: spontaneous.<br>CLAY 2: creative.<br>CPLAY 3: playful.<br>CPLAY 4: unoriginal. |
| Perceived Enjoyment (ENJ) | The extent to which "*the activity of using a specific system is perceived to be enjoyable in its own right, aside from any performance consequences resulting from system use*". | ENJ 1: I enjoy using the QSVS web portal.<br>ENJ 2: Navigating on the QSVS web portal is pleasant.<br>ENJ 3: I find that using the QSVS web portal is pleasant. |
| Self-evaluation of digital competence (SDC) | | On a scale from 0 to 10, self-assessment of current personal skills for using the Internet in general, where 0 means no personal skills and 10 means a very high level of skill. |
| Behavorial Intention (BI) | | BI: During the next month, I intend to consult the QSVS web portal. |

QSVS: Quebec Society of Vascular Sciences.
[a] All concepts, except Self-evaluation of digital competence, were measured on a 7-point Likert scale (where 1: *strongly disagree*; 2: *moderately disagree*, 3: *somewhat disagree*, 4: *neutral* (neither disagree nor agree), 5: *somewhat agree*, 6: *moderately agree*, and 7: *strongly agree.*

**Table 2**
Participants' characteristics.

| | Total | Age groups, years | | |
|---|---|---|---|---|
| | (n = 164) n (%) | ≤ 64 (n = 76) n (%) | 65-74 (n = 56) n (%) | ≥ 75 (n = 32) n (%) |
| Female | 88 (53.7) | 48 (63.2)[b] | 28 (50.0) | 12 (37.5) |
| Age, mean ± SD | 64.3 ± 11.7 | 54.3 ± 8.5[a] | 69.2 ± 2.5[a] | 79.3 ± 3.7[a] |
| University degree | 61 (37.2) | 32 (42.1) | 22 (39.3) | 7 (21.9)[a] |
| Retired | 98 (60.0) | 24 (31.5)[a] | 46 (82.1) | 28 (87.5) |
| ≥ 1.5 h of physical activity per week | 57 (35.0) | 31 (40.8) | 17 (30.4) | 9 (34.8) |
| Tobacco users | 30 (18.0) | 18 (23.7) | 11 (19.6) | 1 (4.3)[a] |
| Alcohol consumption. at least weekly | 41 (25.0) | 18 (17.3) | 14 (25.0) | 9 (25.0) |
| DASH most of the time | 85 (51.8) | 35 (46.1) | 32 (57.1) | 18 (51.8) |
| Hypertension | 82 (50.0) | 33 (43.4) | 31 (55.4) | 18 (56.3) |
| Diabetes | 42 (25.6) | 13 (17.1)[a] | 19 (33.9) | 10 (31.3) |
| Peripheral arterial disease | 17 (10.4) | 8 (10.5) | 3 (5.4) | 6 (18.8) |
| Deep vein thrombophlebitis | 13 (7.9) | 6 (7.9) | 5 (8.9) | 2 (6.3) |
| Chronic kidney disease | 17 (10.4) | 6 (7.9) | 8 (14.3) | 3 (9.4) |
| Age-adjusted Charlson Comorbidity Index Score, mean (SD) | 3.9 (1.8) | 2.9 (1.6)[a] | 4.5 (1.3)[a] | 5.4 (1.8)[a] |
| Self-assessment of physical health as good or excellent | 110 (67.1) | 60 (65.7) | 39 (69.6) | 21 (65.6) |
| Self-assessment of mental health as good or excellent | 154 (93.9) | 69 (90.8) | 54 (96.4) | 31 (96.9) |

Legend and abbreviations: DASH: Dietary Approaches to Stopping Hypertension.
a: $p < 0.05$ with other age groups.
b: $p < 0.05$ with ≥75-year-old group.

### 3.1.2. Motivation

For all the participants (n = 164), autonomous motivation received the highest score, 5.33 ± 0.74 compared to 3.33 ± 1.36 for amotivation and 2.62 ± 1.36 for controlled motivation ($p < 0.001$). There was no significant difference between age groups in terms of autonomous motivation. However, amotivation (3.68. ±1.17 vs 3.08. ±1.42) and controlled motivation (3.10 ± 1.24 vs 2.38 ± 1.48) were higher in the 75+ group than in the 64 and under group ($p < 0.05$).

**Table 3**
Use of digital tools.

| | Total | Age groups | | |
|---|---|---|---|---|
| | (n = 164) n (%) | ≤ 64 (n = 76) n (%) | 65-74 (n = 56) n (%) | ≥ 75 (n = 32) n (%) |
| Using your cell phone | 97 (51.7) | 58 (76.3)[a] | 28 (50.0)[c] | 11 (34.4)[c] |
| Tablet use | 95 (57.9) | 33 (43.4)[a] | 38 (67.9)[c] | 24 (75.0)[a] |
| Computer use | 113 (68,9) | 53 (69.7) | 40 (71.4) | 20 (62.5) |
| Internet use 1–3 h per day | 82 (50.0) | 36 (47.4) | 29 (51.8) | 17 (53.1) |
| Send an e-mail with attached file | 133 (81.0) | 66 (86.8)[b] | 47 (83.9)[b] | 20 (62.5)[a] |
| Download files | 125 (76.2) | 66 (86.8)[a] | 39 (69.6)[a] | 20 (62.5)[a] |
| Upload files | 74 (45.1) | 43 (56.6)[a] | 24 (42.9)[b] | 7 (21.9)[a] |
| Using a web application for audio and video calls | 132 (80.5) | 68 (89.5)[a] | 42 (75.0)[c] | 22 (68.8)[c] |
| Post messages in chat forums | 107 (65.2) | 60 (78.9)[a] | 34 (60.7)[a] | 13 (40.6)[a] |
| Access a retailer's or institution's website using a login and password | 135 (82.3) | 69 (90.8)[a] | 44 (78.6) [b-c] | 22 (68.8)[c] |
| Take part in an online training course | 65 (39.6) | 43 (56.6)[a] | 16 (28.6)[c] | 6 (18.8)[c] |
| Self-assessment of skills in using digital tools, scale 0–10, mean (SD) | 5.8 (3.1) | 7.0 (3.0)[a] | 5.3 (2.7)[a] | 4.00 (2.8)[a] |

a: $p < 0.05$ with other age groups.
b: $p < 0.05$ with ≥75-year-old group.
c: $p < 0.05$ with ≤ 64-year-old group.

### 3.1.3. Interaction between adapted technology acceptance model III variables, co-variables and sociodemographic data

The PU (OR (95 % CI)6.04 (4.13; 9.09), $p < 0.01$) variable and the RES co-variable (OR (95 % CI) 1.52 (1.05; 2.19),$p < 0.05$) have shown a significant interaction with BI. In terms of the interaction between PU, the co-variables and sociodemographic data gender, age and CCI score, only "age" has demonstrated a significant interaction with the co-variable SN (OR (95 % CI)1.05 (1.02; 1.09), $p < 0.01$) and RES (OR (95 %CI)1.05 (1.02; 1.09), $p < 0.01$) and interacting with BI (Table 4).

PEOU, (OR (95 % CI)2.39 (1.77; 3.26), $p < 0.01$) and co-variables SDC (OR (95 % CI)0.70 (0.52; 0.95) $p < 0.05$), CSE (OR (95 % CI) 0.49 (0.36; 0.68) $p < 0.01$), ENJ (OR (95 % CI) 4.14 (2.51; 6.98) $p < 0.01$), and CANX (OR (95 % CI) 1.49 (1.07; 2.13) $p < 0.05$, have a significant interaction with BI. Only the "age" sociodemographic data has shown a significant interaction with all PEOU co-variables and the BI ($p < 0.05$) (Table 5).

**Table 4**
TAM III PU, co-variables and sociodemographic data interacting with BI.

| Interacting variables with BI | OR (95 % CI) | P_value |
|---|---|---|
| PU | 6.04 (4.13; 9.09) | <0.01 |
| PU:PEOU | 0.79 (0.60; 1.06) | 0.79 |
| SN | 1.39 (0.99; 1.96) | 0.054 |
| PU:SN | 0.86 (0.59; 1.24) | 0.42 |
| PU: SN: age | 1.05 (1.02; 1.09) | <0.01 |
| PU: SN: gender | 1.46 (0.81; 2.63) | 0.21 |
| PU: SN: CCI score | 0.96 (0.77; 1.19) | 0.70 |
| RES | 1.52 (1.05; 2.19) | 0.02 |
| PU: RES | 0.90 (0.63; 1.28) | 0.56 |
| PU: RES: age | 1.05 (1.02; 1.09) | <0.01 |
| PU: RES: gender | 1.36 (0.76; 2.42) | 0.30 |
| PU: RES: CCI score | 0.97 (0.77; 1.20) | 0.76 |

Legend and abbreviations: BI, behavioral intention; CI, confidence interval; OR, odds ratio; PU, perceived usefulness; SN, subjective norm; CCI, Charlson co-morbidity index; RES, demonstrability of results.

## 3.2. Qualitative phase: the focus groups

Two focus groups, 60 min each, were conducted in the presence of a researcher (AM) and an observer (JRB). The focus groups took place in October 2023 and January 2024 respectively. A total of 10 participants (P1-P10, 3 men, 7 women, aged 41 to 76) was included (n = 5 per focus group).

### 3.2.1. Four main themes identified

#### 3.2.1.1. Theme 1: consulting the internet for personal information needs.

Participants have talked about their motivations for taking part in the study, and therefore to visit the QSVS website. These motivations were essentially the fact of being affected by, or having suffered from, a cardiovascular event, or of having a family member affected:

> P4 "… *my only interest is the chance discovery of a problem I have, and it was from that day on that I became interested.*"

They have also looked for additional information following medical appointment with health professionals:

> P5 "*Mainly it's to look for a definition, an understanding at the time, because meetings I've had with doctors they'll use a lot of technical terms, he won't explain it to you*".

#### 3.2.1.2. Theme 2: easily accessible, scientifically reliable information.

Technical aspects were addressed by several participants. They have liked that the website was easy to navigate:

> P4: "*You have to show the way for people who have difficulty understanding*".

**Table 5**
TAM III PEOU, co-variables and sociodemographic data interacting with BI.

| Interacting variables with BI | OR (95 % CI) | P Value |
|---|---|---|
| PEOU | 2.39 (1.77; 3.26) | <0.01 |
| SDC | 0.70 (0.52; 0.95) | 0.02 |
| SDC: PEOU | 0.93 (0.71; 1.23) | 0.62 |
| SDC: PEOU: age | 1.05 (1.02; 1.09) | <0.01 |
| SDC: PEOU: gender | 1.38 (0.76; 2.42) | 0.28 |
| SDC: PEOU: CCI_Score | 0.96 (0.77; 1.20) | 0.73 |
| CSE | 0.49 (0.36; 0.68) | <0.01 |
| CSE: PEOU | 1.28 (0.92; 1.79) | 0.15 |
| CSE: PEOU: age | 1.05 (1.02; 1.09) | <0.01 |
| CSE: PEOU: gender | 1.38 (0.77; 2.47) | 0.28 |
| CSE: PEOU: CCI score | 0.96 (0.77; 1.20) | 0.74 |
| ENJ | 4.14 (2.51; 6.98) | <0.01 |
| ENJ: PEOU | 1.26 (0.84; 1.88) | 0.27 |
| ENJ: PEOU: age | 1.05 (1.02; 1.09) | <0.01 |
| ENJ: PEOU: gender | 1.32 (0.74; 2.35) | 0.35 |
| ENJ: PEOU: CCI score | 0.96 (0.77; 1.19) | 0.70 |
| CANX | 1.49 (1.07; 2.13) | 0.02 |
| CANX: PEOU | 1.24 (0.92; 1.73) | 0.18 |
| CANX: PEOU: age | 1.05 (1.02; 1.09) | <0.01 |
| CANX: PEOU: gender | 1.39 (0.78; 2.49) | 0.26 |
| CANX: PEOU: CCI score | 0.97 (0.78; 1.20 | 0.76 |
| CPLAY | 1.33 (0.99; 1.78) | 0.06 |
| CPLAY: PEOU | 0.94 (0.70; 1.24) | 0.66 |
| CPLAY: PEOU: age | 1.05 (1.15; 2.82) | 0.00 |
| CPLAY: PEOU: gender | 1.36 (0.85; 2.77) | 0.29 |
| CPLAY: PEOU: CCI score | −0.04 (−0.26; 0.18) | 0.73 |

Legend and abbreviations: BI, behavioral intention; CI, confidence interval; OR, odds ratio; PEOU, perceived eased of used; SDC, personal self-assessment of digital competence; CCI, Charlson comorbidity index CSE, computer self-efficacy; ENJ, perceived enjoyment; CANX, computer anxiety; CPLAY, computer playfulness.

They liked pictograms, images and drawings. Many participants have talked about the importance of reliable information:

P7: "*You know all the people involved in these things? They're all identified. You know where it comes from and all that. Personally, that reassures me*".

They also shared that in the presence of a lot of advertising or too many different topics, they are less comfortable and tend to leave. Updating the information was a crucial point:

P10: "*Updating, having content that's really up to date and dated*".

P8: "*I don't go back to sites where it's "asleep"*.

*3.2.1.3. Theme 3: information That's easy to understand.* Although the opinions of some participants were divergent some find that there was too little others too much information, the majority supported the importance of an appropriate level of language in their comments:

P9: "*Yeah, if it's really too scientific, yeah. I wouldn't understand anything. If it's all reading.*"

P2: "*Use everyone's words. The word 'Phlebitis' isn't there*," … "*It's complicated, the real word.*"

*3.2.1.4. Theme 4: giving meaning to content.* The ability to put a human face on information was a recurring theme. They appreciated the inclusion of short videos of healthcare professionals:

P3:"*When there's a short video that you can choose to go and see, and it's the doctor talking, I thought that was great, because people who are more auditory will follow the short video and can listen to it 3-4-5 times if they want, whereas reading it can be difficult for a lot of people"*.

The inclusion of testimonials from people suffering from the vascular health problems addressed was also mentioned as an element that would give meaning to the content:

P2: "*It gives you hope, you know, people who have been through it.*"

P6: "*I need a testimonial, I need someone to talk to me, to give me examples, and I've managed to get through such and such a case*."

## 4. Discussion

This study provides a comprehensive overview of an older population of users of OHIR characteristics, including digital skills and health conditions, but also factors that interact and barriers and facilitators to using an OHIR. The results indicate that PU is strongly associated with the intention to use (BI) the OHIR with an OR of 6.04. This suggests that each one-unit increase in PU multiplies the likelihood of adopting the OHIR by approximately six. From a practical standpoint, it indicates that enhancing users' perceptions of usefulness (e.g., by highlighting tangible benefits to prevent diseases or taking care of their health) could greatly increase OHIR adoption. Additionally, PEOU also emerges as a significant predictor (OR = 2.39). These results of the PU and PEOU are consistent with the results of the focus group of this study and comparable with other studies [19,37–39]). Moreover, the strong influence of ENJ (perceived enjoyment_ *I find using the web portal enjoyable. The process of using the web portal is pleasant, I enjoy using the web portal*) (OR = 4.14) points to the importance of creating a positive, engaging user experience when designing or promoting the OHIR.

### 4.1. Characteristic: age as a determining data ?

The interaction analyses further reveal that "age" is a key determinant in the relationship between certain co-variables and BI, highlighting the importance of considering sociodemographic characteristics when developing implementation strategies. What's more, the 75+ age group showed a significantly higher intention to consult the OHIR (score from 1 to 7), 6.19 ± 1.15, than the 65–74 age group, 5.38 ± 1.59, and the 64 and underage groups, 5.17 ± 1.64 ($p < 0.05$). On the other hand, the "age" sociodemographic data was the only one that have shown a significant interaction with variables and co-variables from TAM III (Tables 4–5). Indeed, apart from age, the other differences in sociodemographic characteristics and digital skills between the groups in our study do not tend to explain this result. In fact, the 75+ age group had less education than the younger group, whereas the literature tends to show a positive association between educational level and intention to use digital resources [11,13–15]. This same group had a lower proportion of women, 37.5 %, than the group aged 64 and under 63.2 % ($p < 0.05$). Here again, the literature tends to show that women are more likely to use digital tools than men [13,18,40]. Finally, the 75+ age group perform fewer digital-related tasks and self-assess that they have lower digital skills than younger age groups, which is not conducive to greater use of OHIR. What's more, an increase in SDC score and the TAM III co-variable CSE (computer self-efficacy) are associated with a respectively 30 % ($p = 0.02$) and 51 % ($p < 0.01$) reduction in the likelihood of intending to use OHIR (Table 5).

On the other hand, the 75+ age group reported a higher proportion of diabetes diagnoses and a higher age-adjusted CCI score than the younger groups. This result related to CCI score was expected and has already been shown in the literature [41,42]. The fact that the older group is more affected by the disease may partly explain why they intend to use OHIR more than the younger groups (PU). However, this statement must be qualified. It is interesting to note that, despite a significant difference in the CCI score between the age groups, each of the age groups considered themselves to be in good or excellent physical and mental health (Table 2). Moreover, the Pearson correlation between the CCI score and BI is rather weak (0.12). Perceived health status may therefore have a greater influence on the intention to use OHIR than the number or severity of comorbidities. Moreover, the perception of poor health may be associated with a lower intention to use OHIR. Indeed, in an American study of 7060 participants, self-reported poor health was associated with a significant lower likelihood of using OHIR (aOR = 0.53, CI = 0.40–0.70, $P < 0.001$) [13].

Therefore, with the exception of a few studies such as this one by Sinha and Serin [43], (n = 1137): as people aged, they searched for significantly more health guidance information ($P < 0.001$), most of the studies that have examined online health information-seeking behavior [44–48], demonstrate a negative association between age and intention to use an OHIR.

### 4.2. Extrinsic motivation as part of the answer

To better understand this result, the older age group expressed a stronger intention to consult OHIR than the younger age group; extrinsic motivation may shed some light on this. In our cohort's, extrinsic motivation was significantly higher in the 75 and over age group, 3.1 ± 1.24, than in the 64 and under age group, 2.38 ± 1.44 ($p = 0.014$). Few studies inform us about the links between types of motivation and the use of OHIR. A Chinese study using a constructivist grounded theory approach highlights the importance of support from the partner and social norms for the use of OHIR [49]. The cross-sectional correlational study from Cajita and colleagues (n = 129, mean age 71.3 ± 4.6) [50] sheds some interesting light. In addition to perceived ease of use ($\beta = 0.16$, $P < 0.001$) and perceived usefulness ($\beta = 0.33$, $P < 0.001$), which were associated with the intention to use a health technology, social influence ($\beta = 0.17$, $p = 0.01$), associated with extrinsic motivation, also played an important role. The authors suggest that this association may reflect the trust that older people tend to place in their doctors and nurses. Indeed, the elderly tend to place particularly high levels of trust in their healthcare providers [51–53] and it may play and essential role in the intention to use of OHIR [54]. This may partly explain the higher

extrinsic motivation in the 75+ age group, and therefore why age would be positively associated with intention to use OHIR. Yet, having an OHIR recommended by a healthcare provider may help to ensure it is adopted [55]. Therefore, the variable "age" as a determining factor in our study could be related to the fact that older participants with a longer history of vascular disease have been under medical care for many years. Thus, the importance of this relationship and trust with the care team could be an important extrinsic motivator leading to the intention to use an OHIR. This is consistent with data from the meta-analysis by Qui Ma and colleagues [19], which showed that social norms and the influence of professional caregivers have a significant impact on the adoption of new technologies by older people.

### *4.3. Participants' perceptions of an online vascular information health resource: facilitators and barriers*

Throughout the focus groups, participants mentioned that consulting a OHIR was associated (facilitators) with the presence of a specific health condition (PU). This seems to be in line with the results of other studies such as that by Li and colleagues [56], for whom the results suggest that seeking information on specific diseases was one of the three primary factors. The study by Lim and colleagues goes in the same direction [57]. This study explored the experiences and influences of online health information-seeking about statin use among 20 adults aged 38 to 74 with high cardiovascular risk. Interestingly, most participants stopped seeking online health information when cholesterol levels were under control.

The need for simple, easy access to information, including a suitable level of language (facilitators), which also referred to PEOU, expressed by participants also ties in with the study by Lazard and colleagues in which simplicity having one of the greatest impact on the intention to consult online health information [58]. This point was also highlighted in a qualitative study using focus groups, where participants expressed the need for inclusive technology platforms adapted to the needs of older people [59]. Furthermore, in the results of a meta-ethography of 10 qualitative studies, these elements emerged as determinants of OHIR use, namely: that the level of convenience of an application's interface and design, "*must be simple and straightforward*", and that "*familiar platforms may increase older adults' usage of communicative e-health services and thereby increase their access to healthcare*" [54].

Another of the reasons also mentioned by participants for consulting online health information was about having some dissatisfaction with or misunderstanding of the information conveyed by their doctor. This finding was also found in a study (n = 331) that looked at the predictors of patients' post-visit online health information seeking [60]. Dissatisfaction with the physician's performance motivated information seeking for 40 % of respondents [60].

The notion of Web resource reliability (PU), a need expressed by our participants, was also found in a systematic review looking at online search behavior [44]. Indeed, they concluded that a poor quality and low reliability of the online health information (abundant misinformation) hinder health information consumers' trust, and therefore negatively influence their online seeking behavior (barriers) [44]. To this end, Miller and colleagues [61] have suggested that older people could benefit from special instructions designed to boost Internet trust, for example, learning how to distinguish between high- and low-quality health-related websites (PEOU-PU).

## 5. Recommandations

Based on these findings, a number of recommendations can be made. First, OHIR designers, including policy makers, targeting adults with chronic conditions, who are therefore often an older segment of the population, should consider their audience. This means providing an appropriate digital interface in terms of digital functionality, including.

- Optimising the design of their web tool for use with a tablet; - Presenting easily accessible information;
- Using language that is simple and familiar to a wide audience;
- Demonstrating the reliability or scientific value of the information presented in a clear and simple way;
- Include content in the form of videos/testimonials from professionals or people in similar health situations.
- Provide an OHIR that is perceived to be as enjoyable or pleasant to use

Second, for researchers, it would be important to measure the intensity and quality of the connection between health professionals and patients, and the association with the adoption of digital health tools. Finally, for clinicians, our data tend to highlight the importance of the quality of the relationship between health professionals and people receiving care. This may have an impact on the sharing of information and possibly on the adoption of behaviours that promote taking charge of one's health, such as the use of OHIR.

## 6. Limitation

One of the main limitations of this study was that the main outcome is not the behavior itself that is to consult an OHIR, but the intention to. Some may argue that the intention does not necessarily translate into behavior. Nevertheless, some studies offer an answer to this question, showing a significant association between intention and behavior. In fact, intention or attitude is correlated with behavior from 0.40 [62] to 0.52 [63]. In a more nuanced way, the intention would explain around 30 % of the variance in behavior [26,62,64]. Setting up a longitudinal study to measure whether intention translates into behavior would make it possible to overcome this limitation. In addition, although certain measures were taken to avoid a social desirability and reference bias [65], using a pre-established script that stated that "*obviously, whether or not you agree to participate in this research project has no influence on the quality of care you will receive here*" and the fact that the questionnaire was anonymous, it cannot be ruled out that those biases were partly present and that it influenced the responses regarding to the intention to consult the web portal. This is one of the limitations of self-reported data [65]. The results must therefore be interpreted with this in mind. Finally, we recognize that the lack of assessment of the reliability (e.g. Cronbach's alpha) and validity (e.g. construct validity) of the variables in the tools used in our questionnaire is a limitation of this study. Although the questionnaire was constructed from tools already validated in the literature, the interpretation of the results would have been strengthened by confirmation of their psychometric properties in this specific context.

## 7. Conclusion

Online resources can meet the need for access to reliable and accessible health information. Our results, obtained from an older population with vascular disease, show that while age is associated with differences in digital skills and habits, it is not a barrier to the use of OHIR. In fact, more than age, perceived usefulness in relation to personal health concerns and perceived ease of use - simplicity of interfaces, appropriate language, to have an OHIR that is perceived as enjoyable to use - appear to be determinants of intention to use an OHIR. Finally, based on our results, we hypothesize that people who have been followed by a care team for a long period of time, such as people with vascular disease, may have an additional (extrinsic) motivation to use OHIR. This study highlights the need to characterize the target population and adapt OHIR accordingly.

## CRediT authorship contribution statement

**André Michaud:** Writing – review & editing, Writing – original

draft, Visualization, Validation, Supervision, Software, Resources, Project administration, Methodology, Investigation, Funding acquisition, Formal analysis, Data curation, Conceptualization. **Virginie Blanchette:** Writing – review & editing, Validation, Methodology, Funding acquisition, Conceptualization. **François Boudreau:** Writing – review & editing, Validation, Methodology, Funding acquisition, Conceptualization. **Sarah Lafontaine:** Writing – review & editing, Validation, Methodology, Funding acquisition. **Denis Leroux:** Writing – original draft, Validation, Methodology, Funding acquisition, Formal analysis. **Paule Miquelon:** Writing – review & editing, Validation, Methodology, Funding acquisition, Conceptualization. **Michel Vallée:** Writing – review & editing, Validation, Methodology, Funding acquisition, Conceptualization. **Joany Rousseau-Bédard:** Validation, Software, Methodology, Investigation, Formal analysis, Data curation. **Lyne Cloutier:** Writing – review & editing, Validation, Supervision, Resources, Methodology, Funding acquisition, Formal analysis, Conceptualization.

## Declaration of generative AI and AI-assisted technologies in the writing process

Declaration of AI-assisted technologies in the writing process: Deepl free version software was used in the writing process in order to assist for translation from French to English. No generative AI was used.

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## Declaration of competing interest

The authors **Virginie Blanchette; Michel Vallée; Joany Rousseau-Bédard; Lyne Cloutier** declare that they are collaborators or have collaborated as consultants or administrators, without financial ties, with the QSVS.

**André Michaud François Boudreau; Sarah Lafontaine; Denis Leroux; Paule Miquelon** report no declarations of interest.

## Appendix A

**Verbatim:** approach of the participants by the collaborating health professionals.
At the end of the medical appointment.

| Participant approach |
|---|
| "I would like to talk to you and give you information about a research project that may be of interest to you and for which you may be eligible. Would you like me to talk to you about it for a few minutes? » |
| **No:** end of discussion. " Thanks very much " |
| **Yes:** "I am giving you this explanatory leaflet which summarizes the project. You will take the time to read it well. You will see that your participation in the research project consists of answering a questionnaire which will take about 20 min of your time. Obviously, whether or not you agree to participate in this research project has no influence on the quality of care you will receive here.<br>In order to participate in the study, you must first go to this internet address *(indicate on the explanatory card). You will find the information necessary for your participation in the study, including the electronic consent form. You also have an email address if you ever have questions for the research team. » |

## Appendix B

Questionnaire – QSVS_RESEARCH.
SECTION 1:
At this first step, you must consult the QSVS web portal. This section to be completed is essential to the continuation of this questionnaire. Please read the full instructions.

1. You will need to click on the blue link below which will open a new web page.
2. Explore the entire web portal to the best of your ability and according to your interests for **5–10 min**.
3. Return here to continue the questionnaire.
4. Click on the green rectangle at the bottom to continue.
   ** If you have trouble coming back here, to the questionnaire:
   - Type "*recherche.ssvq.org*" again in your search bar at the top.
   - Skip Section 1, already completed, and start Section 2 by clicking on the green rectangle at the bottom right.

Click on this link in blue to consult the Web portal yourvascularhealth.ca.
SECTION 2:
Q1What's your birthday?

| | Month | Day | Year |
|---|---|---|---|
| Choose from drop-down menu (1) | ▼ January (1 … December (12) | ▼ 1 (1 … 31 (31) | ▼ 1900 (1 … 2049 (150) |

Q2 What is your gender?

☐Male (1)
☐Female (2)
☐Other (3)
☐Prefer not to answer (4)

Q3 What is your highest level of education completed?

☐Elementary (1)
☐High school (2)
☐Professional (3)
☐College (4)
☐University (5)
☐Prefer not to answer (6)

Q4 Which statement best corresponds to your level of understanding of written English?

☐I understand simple texts (in non-demanding and usual contexts of language use). (1)
☐I understand moderately complex texts in a moderately demanding context of language use. (2)
☐I understand complex written messages in a demanding context of language use. (3)

Q5 During the past 12 months, was your main activity working at a paid job?

☐Yes (1)
☐No (2)

Afficher cette question:
If During the past 12 months, was your main activity working at a … = No.
Q5.1 During the past 12 months, what was your main activity?

☐Looking for a paid job (1)
☐be in school (2)
☐You take care of/Care for your children (3)
☐housework (4)
☐Retired (5)
☐Maternity, paternity or parental leave (6)
☐long-term illness (7)
☐Volunteering or caring for children other than your children (8)
☐Others (9)

Q6 In a week, on average, how long do you do moderate-to-vigorous physical activity? By moderate-to-vigorous, it means activity during which you are a little short of breath and get a little hot.

☐0 min (1)
☐Less than 30 min (2)
☐30 min or more, but less than 1 h 30 min (3)
☐1 h 30 min or more, but less than 2 h 30 min (4)
☐More than 2 h 30 min (5)

Q7 In general, how would you describe your physical health?

☐Excellent (1)
☐Very good (2)
☐Good (3)
☐Fair (4)
☐Bad (5)

Q8 In general, how would you describe your mental health?

☐Excellent (1)
☐Very good (2)
☐Good (3)
☐Fair (4)
☐Bad (5)

Q9 To the best of your knowledge, among the following diagnoses, health situation or illnesses, click on those that correspond to your situation (*more than one possible choice*).

☐Uncomplicated diabetes (1)
☐Diabetes with complications (2)
☐Myocardial infarction (heart attack) (3)
☐Heart failure (4)
☐Stroke (5)
☐Dementia (6)
☐Hemiplegia (paralysis affecting only one side of the body) (7)
☐Raynaud's disease (8)
☐Deep vein thrombosis (9)
☐Arterial hypertension (high blood pressure) (10)
☐Pulmonary embolism (11)
☐Obliterating arterial disease of the lower limbs (peripheral arterial disease) (12)
☐Chronic lung disease (COPD) (13)
☐Connective tissue disease (connectivity) (14)
☐Peptic ulcer disease (gastroduodenal ulcer) (15)
☐Moderate to end-stage renal failure (creatinine greater than 30 mg/L, chronic kidney disease or CKD) (16)
☐Liver cirrhosis with or without bleeding (17)
☐Leukemia (18)
☐Lymphoma (19)
☐Solid tumor (20)
☐Metastatic solid tumor (with metastasis) (21)
☐HIV disease (with or without AIDS) (22)
☐none of the above (23)

Q10 Do you have difficulty seeing, even when wearing your glasses/contact lenses?

☐No difficulty (1)
☐Some difficulty (2)
☐A lot of difficulty (3)
☐Can't do at all/Unable to do (4)

Q11 Do you have difficulty hearing, even when wearing a hearing aid?

☐No difficulty (1)
☐some difficulty (2)
☐A lot of difficulty (3)
☐Can't do at all/Unable to do (4)

Q12 How often does your diet correspond to the following statement: *My diet consists of nutritious foods including vegetables, fruits, whole grains and protein foods such as legumes, nuts, fish, shellfish, eggs, poultry and lean red meats* ?

☐Never (1)
☐Sometimes (2)
☐Often (3)
☐Regularly (4)

Q13 What device(s) do you use to go online? (*more than one choice possible*).

☐Cell phone (1)
☐Electronic tablet (2)
☐Computer (3)

Q14 On average, how long do you use the internet per day?

☐Less than 1 h per day (1)
☐Between 1 h and 3 h (2)
☐More than 3 h (3)

Q15 In the past 30 days, how often did you use tobacco products?

☐Daily (1)
☐Less than once a day, but at least once a week (2)
☐Less than once a week, but at least once in the last month (3)
☐Not at all (4)
☐Prefer not to answer (5)

Q16 How often in the past 12 months have you had 3 or more drinks of alcohol on one occasion?

☐Never (1)
☐Less than once a month (2)
☐Once a month (3)
☐2 to 3 times a month (4)
☐once a week (5)
☐More than once a week (6)
☐Prefer not to answer (7)

Q17 What is your postal code?

☐(A0A 0A0) (5) _____

Q18 On a scale from 0 to 10, how would you rate your current personal skills for using the internet in general, where 0 means no personal skills and 10 means very high level of skills.

| | No personal skills 0 (1) | 1 (2) | 2 (3) | 3 (4) | 4 (5) | 5 (6) | 6 (7) | 7 (8) | 8 (9) | 9 (10) | Very high skill level 10 (11) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| My ability to use the internet in general. (2) | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o |

Q19 Among the following list, which activity (ies) have you already carried out on the Internet?

| | Yes (1) | No (2) |
|---|---|---|
| Use a search engine (example: Google). (1) | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o |
| Send emails containing attached files (example: document, photo, etc.). (2) | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o |
| Upload documents, games, images, movies or music to Internet sites (example: to social networking sites like Facebook). (3) | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o |
| Make phone or video conference calls, such as Messenger, Zoom, Teams or FaceTime. (4) | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o |
| Post messages in chat forums, thematic or discussion forums including social networking sites such as Facebook. (5) | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o |
| Upload files or documents to storage platforms (example: Dropbox, Apple Cloud or Google Drive). (6) | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o |

Q20 Among the following list, which activity(ies) have you already carried out in **the last three months** on the Internet?.

| | Yes (1) | No (2) |
|---|---|---|
| Access, with username and password, the website of a merchant, financial institution, association, government department or agency, etc. (1) | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o |
| Complete and submit a form online from a government website. (2) | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o |
| Participate in online training, whatever the subject. (3) | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o |

Q21 There are several reasons why individuals may choose to view or use the QSVS web portal.
For each of these following statements, choose on ", which best corresponds to your situation by completing the following sentence:

"I would consult the QSVS web portal because … "

| | Strongly disagree (1) | Quite in disagreement (2) | Slightly in disagreement (3) | Neither agree nor disagree (4) | Slightly in agreement (8) | Quite in agreement (5) | Strongly agree (6) |
|---|---|---|---|---|---|---|---|
| … I would feel guilty if I didn't. (1) | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o |

(*continued on next page*)

(*continued*)

| | Strongly disagree (1) | Quite in disagreement (2) | Slightly in disagreement (3) | Neither agree nor disagree (4) | Slightly in agreement (8) | Quite in agreement (5) | Strongly agree (6) |
|---|---|---|---|---|---|---|---|
| … using a tool like the web portal is important to be as healthy as possible. (2) | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o |
| … others would be mad at me if I didn't use it. (3) | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o |
| … I don't really know why I would use it. (4) | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o |
| … I want others to see that I can do it. (5) | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o |
| … I feel like I want to take responsibility for my own health. (6) | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o |
| … taking care of my health is an important choice that I really want to make. (7) | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o |
| … taking charge of my health is consistent with my life goals. (8) | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o |
| … I would feel bad not to use it. (9) | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o |
| … it's easier to do what I'm told than to think about it. (10) | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o |
| … I feel pressure from others to use it. (11) | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o |
| … I want others to approve of me. (12) | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o |
| … I really don't plan to use the QSVS web portal. (13) | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o |
| … I've thought about it a lot and I think it's important for many aspects of my life. (14) | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o |
| … I personally believe it's a great thing for my health. (15) | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o |

Q22 1 de 3 For each of the statements below, choose from " *Strongly disagree* " to " *Strongly agree* " which best describes your situation.

| | Strongly disagree (1) | Quite in disagreement (2) | Slightly in disagreement (3) | Neither agree nor disagree (4) | Slightly in agreement (5) | Quite in agreement (6) | Strongly agree (7) |
|---|---|---|---|---|---|---|---|
| I find that using the QSVS web portal is pleasant. (1) | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o |
| I can use the QSVS web portal, as I had used similar web portals before this one. (2) | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o |
| Using the QSVS web portal improved my efficiency in managing my health. (3) | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o |
| I find the QSVS web portal useful in helping me take charge of my health. (4) | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o |
| I find the QSVS web portal easy to use. (5) | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o |
| I enjoy using the QSVS web portal. (6) | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o |
| People important to me believe that I should use the QSVS web portal. (7) | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o |
| In general, those around me encourage the fact that I use the QSVS web portal. (8) | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o |

Q22 2 de 3 For each of the statements below, choose from " *Strongly disagree* " to " *Strongly agree* " which best describes your situation.

| | Strongly disagree (1) | Quite in disagreement (2) | Slightly in disagreement (3) | Neither agree nor disagree (4) | Slightly in agreement (5) | Quite in agreement (6) | Strongly agree (7) |
|---|---|---|---|---|---|---|---|
| The people who influence my behavior believe that I should use the QSVS web portal. (9) | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o |

(*continued on next page*)

(*continued*)

| | Strongly disagree (1) | Quite in disagreement (2) | Slightly in disagreement (3) | Neither agree nor disagree (4) | Slightly in agreement (5) | Quite in agreement (6) | Strongly agree (7) |
|---|---|---|---|---|---|---|---|
| Using the QSVS web portal improved my efficiency in managing my health. (10) | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o |
| I would have no difficulty in mentioning to other people the usefulness of the QSVS web portal. (11) | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o |
| I believe that I could inform other people of the consequences of using the QSVS web portal. (12) | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o |
| The effects of using the QSVS web portal are obvious to me. (13) | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o |
| I can use the QSVS web portal even if there is no one near me telling me where to click. (14) | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o |
| Using the QSVS web portal does not require a lot of mental effort. (15) | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o |
| I find it easy to find information on the QSVS web portal. (16) | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o |

Q22 3 de 3 For each of the statements below, choose from " *Strongly disagree* " to " *Strongly agree* " which best describes your situation.

| | Strongly disagree (1) | quite in disagreement (2) | Slightly in disagreement (3) | Neither agree nor disagree (4) | Slightly in agreement (5) | quite in agreement (6) | Strongly agree (8) |
|---|---|---|---|---|---|---|---|
| Using a computer or tablet makes me nervous. (17) | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o |
| Using a computer or tablet makes me uncomfortable. (18) | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o |
| Navigating on the QSVS web portal is pleasant. (19) | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o |
| Using a computer or tablet makes me uncomfortable. (20) | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o |
| I can use the QSVS web portal if someone showed me how to do it first. (21) | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o |
| Interactions with the QSVS web portal are simple and clear to perform. (22) | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o |
| I'm not afraid to use a computer or a tablet. (23) | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o |

Q23 For the statement below, choose from " *Strongly Disagree* " to " *Strongly Agree* " which best fits your situation.

| | Strongly disagree (1) | Quite in disagreement (2) | Slightly in disagreement (3) | Neither agree nor disagree (4) | Slightly in agreement (5) | Quite in agreement (6) | Strongly agree (7) |
|---|---|---|---|---|---|---|---|
| During the next month, I intend to consult the QSVS web portal. (17) | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o |

Q23 How well do the following characteristics represent me when using a computer or tablet ….

| | Strongly disagree (1) | quite in disagreement (2) | Slightly in disagreement (3) | Neither agree nor disagree (4) | Slightly in agreement (5) | quite in agreement (6) | Strongly agree (7) |
|---|---|---|---|---|---|---|---|
| Spontaneous. (1) | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o |
| Creative. (2) | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o |
| Playful or mischievous. (3) | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o |
| Without originality. (4) | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o | color = "#BFBFBF; ">o |

Intro FG The questionnaire is almost complete.

Invitation FG Would you be interested in receiving information in order to participate in the focus group activity related to this research project that will take place in late spring 2024 in the Montreal area?

☐Yes (1)
☐No (2)

IF No: We thank you for your participation. Important, to complete and send the questionnaire, click on the green rectangle.

FG If Yes: In order for us to send you information on this subject, we need your name and your e-mail address. The fact of transmitting this information does not constitute a commitment on your part and at any time, you can choose to withdraw from the process.<a name = "Line_euclid3707624796_259">

☐Full Name (1) _____

Please enter your email address.

_____

Please confirm your email address*.

.

_____

Important, to complete and send the questionnaire, click on the green rectangle.

We thank you for your participation.

## Appendix C. interview guide

Questions/discussion topics:

1. Tell me about your interest in vascular disease?
2. Before participating in the study and completing the questionnaire, were you familiar with the SSVQ web portal? round table.
a. For those who were already familiar with it, how did you find out about it?
b. What reasons led you to consult the Web portal?
3. When you visit a health-related website like SSVQ's, what needs does it meet for you?
a. What information are you looking for, or what are your expectations?
4. One of the objectives of a portal like SSVQ's is to promote health and prevent vascular disease and its complications. I'd like to hear from you about how or why you think a health website can help promote health or prevent complications.
5. Tell me about the facilitating factors that could influence a future consultation or that would make you consult it on a relatively regular basis.
6. What was your perception of the portal? a. Ease of navigation? b. Scientific content (complete? reliable? interesting?) c. Usefulness?
7. Are there any barriers to accessing or using the portal?
8. Please summarize. If I have understood correctly.
9. As the interview draws to a close, is there anything you'd like to add?

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