Open Journal of Preventive Medicine, 2014, 4, 760-770
Published Online October 2014 in SciRes. http://www.scirp.org/journal/ojpm
http://dx.doi.org/10.4236/ojpm.2014.410086

Scientific Research

The Acquisition and Utility of the Family Medical History in Primary Care: A Cross-Sectional Study

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Received 19 August 2014; revised 18 September 2014; accepted 5 October 2014

Abstract

Background: Acquisition of family medical history (FMH) is emphasized as a part of obtaining a complete medical history, but whether FMH is consistently documented and utilized in primary care, as well as how it can affect patient care in this context, remains unclear. Thus, the objectives of this study were to determine: 1) if FMH is regularly acquired in a representative primary care practice (the Queen's Family Health Team, QFHT); 2) what is included in the FMH obtained; 3) what the utility of FMH is with regards to patient management in primary care; and 4) to utilize healthcare practitioners' perspectives in order to elucidate any findings regarding the acquisition and utility of FMH at the QFHT. Methods: Patients were interviewed in order to obtain their FMH. For each patient, the FMH obtained was compared to the FMH documented in the patient's record to determine the record's completeness. Each patient's FMH was analyzed for significant history of coronary artery disease (CAD), diabetes mellitus type II (DMII), substance abuse (SA) and colorectal cancer (CRC). Participants were patients scheduled for appointments at the QFHT between May and July 2011. Any patient of the QFHT older than 25 years was eligible to participate. Clinical staff of the QFHT completed an online questionnaire to determine healthcare practitioners' perspectives regarding the acquisition and utility of FMH. Results: 83 patients participated in the study. Participants ranged in age from 25 - 86 years (median: 63 years); 69% were female. FMH present in patients' records was often either incomplete (42% of charts reviewed) or not documented at all (51% of charts reviewed). Knowledge of FMH can affect patient management in primary care for the diseases assessed (CAD, DMII, SA and CRC). HCP do consider FMH to be important in clinical practice and 86% of respondents stated that they regularly inquired about patients' FMH. Interpretation: Despite the belief by HCP that FMH is important, there is a disparity between this belief and their practices regarding its documentation and utilization. Finally, analysis of the FMH of the representative population studied shows that information commonly missing in patients' FMH can affect patient management at a primary care level.

How to cite this paper: Abate, A.K. and Hall-Barber, K. (2014) The Acquisition and Utility of the Family Medical History in Primary Care: A Cross-Sectional Study. *Open Journal of Preventive Medicine*, **4**, 760-770.
http://dx.doi.org/10.4236/ojpm.2014.410086

Keywords

Family Health, Medical History Taking, Prevention, Primary Health Care, Risk Assessment

1. Introduction

From the start of one's medical education, the importance of obtaining a complete medical history is emphasized as an essential tool for patient care, and family medical history (FMH) is often included within the construct of a complete medical history. However, while the requirements and utility of FMH are well-defined for certain specialties, such as medical genetics [1], these same aspects are considerably less clearly defined for FMH in primary care [2]. One reason to account for this is best stated in the National Institutes of Health State-of-the-Science Conference Statement on Family History and Improving Health: "Family history was a core element of clinical care long before the evidence-based medicine paradigm was even proposed [3]." In other words, it has been considered to be a requirement of inquiry with little proof of why that is the case or what is to be included.

Review of the literature is of little help. In regards to the assessment of utility of FMH, few studies have shown the direct effect of obtaining FMH on improving patient outcome [4] [5]. What is more, these studies have been disease-specific and their results, therefore, cannot be extended to primary care where FMH could be utilized in the assessment of any number of diseases or conditions.

All that can really be stated with confidence is that the most accurate information is obtained when soliciting the FMH of patients' first-degree relatives, when compared to obtaining FMH relating to family members of a higher degree. More accurate information is also obtained when asking patients to recall specific diseases in their FMH, as they are better able to rule out disease (*i.e.* provide a negative family history), rather than recall its presence (*i.e*. provide a positive history) [2].

For these reasons, it is evident that, within the context of primary care, the requirements of FMH, and its utility, lack establishment and warrant further investigation. What is more, given that there are no universally established guidelines for what is to be included in FMH, it is also unclear what healthcare practitioners of a typical primary care practice should include when inquiring about FMH. Thus, the objectives of this study were to assess the practices of a representative primary care practice (the Queen's Family Health Team, QFHT) in order to determine if: 1) FMH is regularly acquired, 2) the methods of acquisition of FMH results in the greatest yield of accurate information (*i.e*. FMH for first-degree family members), 3) the acquisition of a generalized FMH could result in alteration of patient management at a primary care level for a variety diseases and 4) what the perspectives of healthcare practitioners in primary care are in regards to the acquisition and utility of FMH to determine if there is any disparity between the self-report of practices and what is documented in patients' records.

2. Methods

2.1. Study Setting

The study was conducted at the two sites of the Queen's Family Health Team (QFHT) in Kingston, Ontario.

2.2. Patient Population

Participants for the study were selected from patients scheduled for appointments at the QFHT between May and July 2011. Patients were contacted by phone one week prior to their appointments and, if they agreed to participate, were requested to arrive 30 minutes earlier than their scheduled appointment times in order to be interviewed. Participants were informed that they would be asked about their FMH and that their electronic medical record (EMR) would be reviewed. Patients were only excluded from the study if they were under 25 years of age at the time of their scheduled appointment.

Ethics approval of the study was obtained from the Queen's University Health Sciences & Affiliated Teaching Hospitals Research Ethics Board.

2.3. Collection of Family History

When a scheduled participant arrived for his/her appointment, an interview was conducted focusing on the health of his/her first-degree relatives (*i.e*. mother, father, siblings and children). The interviews conducted focused on first-degree relatives as past research has shown that patient memory of FMH is most accurate for first-degree family members [2]. Each interview was conducted by the same investigator and followed a similar construct (**Table 1**). Patients were first asked whether any of their first-degree relatives had a history of a selected set of diseases (cardiovascular disease, diabetes, cancer, asthma, atopy, chronic obstructive pulmonary disease, dementia, mental health conditions, hearing loss, vision loss, and/or obesity). Specific diseases were asked about directly as evidence has shown that patients more accurately report negative history, or the absence of disease in family members, rather than the presence of disease [2]. As there is little information regarding what should be inquired about regarding family medical history during a standard primary care visit [3], the diseases directly asked about were chosen based on discussion between the investigators of this study, as well as questionnaires commonly used for similar studies, such as the Family Healthware Screening Tool developed by the Centers for Disease Control and Prevention [6].

The medical history of each first-degree family member was then reviewed similarly through patient interview, inquiring if any significant medical history had been missed (other conditions, hospitalizations, surgeries, cause of death, etc.). As well, the current age of each first-degree relative was obtained, or the age deceased.

2.4. Analysis of the Documented Family History

Once an up-to-date FMH was obtained by interview, each participant's EMR was reviewed, noting the FMH present on file prior to the start of the study. The FMH on file was identified as "Empty" if the family history field contained no information, "Incomplete" if the field contained any information regarding the patient's FMH and "Complete" if there was some documentation of the health of every first-degree family member. If the family history field of the EMR had been populated prior to the start of the study, the date it was last updated was also noted (3 months prior to the start of the study, 12 months prior to the start of the study, or later).

Table 1. Format of patient interview. Each patient was asked if any first-degree relative had any of the conditions listed in the table. They were asked to specify which relative(s) and the age(s) of onset. Following this line of questioning, patients were then asked to state the current age, or age deceased, of each first-degree relative and to state any other medical conditions these family members' had that they may not have mentioned previously.

Condition	Type, Relationship to Participant and Age of Onset
CAD/CVD	
Diabetes	
Cancer	
Asthma	
Atopy	
COPD	
Dementia	
Mental Health Conditions	
Hearing Loss	
Vision Loss	
Obesity	
Other	
Review of First-Degree Relatives	
Relationship	
Current Age/Age Deceased	
Significant Medical History Not Yet Discussed (Including Cause of Death, If Applicable)	

2.5. Analysis for Significant Family Medical History

The FMH obtained by interview was analyzed to determine whether the participants had a significant family history of coronary artery disease (CAD), diabetes mellitus type II (DMII), substance abuse (SA), colorectal cancer (CRC), polyps, and/or cancers associated with hereditary non-polyposis colorectal cancer (HNPCC-associated cancers). These varied conditions were selected as they are commonly dealt with in primary care, and guidelines for their diagnosis and treatment vary depending on the presence of significant family medical history [7]-[10].

Patients were considered to have a significant family medical history of coronary artery disease if they had a first-degree relative with premature CAD (a male relative younger than 55 years and/or female relative younger than 65 years) as these patients are to be considered to have double the calculated 10-year CAD risk according to Canadian Cardiovascular Society guidelines [7].

Any patient with a first-degree relative with a history of DMII was considered to have a significant family medical history, as the 2008 Clinical Practice Guidelines from the Canadian Diabetes Association considers a first-degree relative with DMII to be a risk factor that would warrant screening for DMII in individuals younger than 40 years of age and/or more frequently than every three years, which is standard for those considered to have a baseline risk [8].

Any patient with a first-degree relative with a history of SA was considered to have a significant FMH, as any history of SA increases the predicted likelihood of opioid abuse by the patient if prescribed opioids for chronic pain, as established using the Opioid Risk Tool (ORT) [10]. The data collected by interview was further analyzed to categorize the particularly kind of SA present in the patient's FMH, as risk of aberrant use of opioids varies with the type of SA. What is more, risk is compounded if there is a FMH of a combination of prescription drug use, illegal drug abuse and/or alcohol abuse [10].

Finally, a patient was considered to have a significant FMH of CRC, polyps or HNPCC-associated cancers if they had one or more first-degree relatives with any of these conditions. HNPCC-associated cancers included: endometrial, small bowel, ureter, kidney/transitional cell, skin, ovarian, pancreatic, gastric, primary brain, and primary hepatobiliary cancers. First-degree FMH of these conditions were considered significant as presence of these conditions stratifies the patient at an increased risk for CRC and, as such, screening tests, such as colonscopy, should first be performed earlier than the standard age of 50 years [9].

2.6. Collection of Healthcare Practitioner Outlooks Regarding the Acquisition and Utility of Family Medical History

To obtain healthcare practitioner (HCP) perspectives, an online survey was circulated to the clinical staff of the QFHT. The survey asked about their FMH-taking behaviours, their opinions regarding the utility of FMH in primary care and ways in which the acquisition of FMH can be improved upon at the QFHT.

3. Results

3.1. Patient Population

A total of 83 patients met the inclusion criteria and agreed to participate in the study. Their ages ranged from 25 - 86 years (median: 63 years). Fifty-seven of the participants (68.7%) were female (**Table 2**).

3.2. Completeness and Currency of the Documented Family Medical History

Thirty-five of the 83 patient records reviewed (42%) contained no documentation of the FMH in the allotted section of the EMR. Fifty-one percent (n = 42) contained some documentation of the patient's FMH, but did not list the health of every first-degree relative of the patient. Only 7% (n = 6) of the patient records reviewed were considered complete in that there was some documentation of health for each first-degree relative of the patient (**Figure 1**).

Thirty of the 48 records (63%) that had some documentation of FMH, whether considered "complete" or "incomplete", were last updated more than one year prior to the start of the study. Thirteen (27%) were updated within the last 12 months, and only 5 records (10%) were updated in the last three months (**Figure 2(a)**). In other words, of all 83 records reviewed, only 22% (n = 18) had the FMH updated in the past year (**Figure 2(b)**).

Table 2. Characteristics of the patient population. Any patient coming in for a scheduled appointment at the Queen's Family Health Team (QFHT) between May and July 2011 was eligible to participate in the study, provided they were above the age of 25. A total of 83 patients participated in the study.

Age, yr	
Median (Range)	63 (25 - 86)
Sex, no. (%)	
Male	26 (31.3)
Female	57 (68.7)

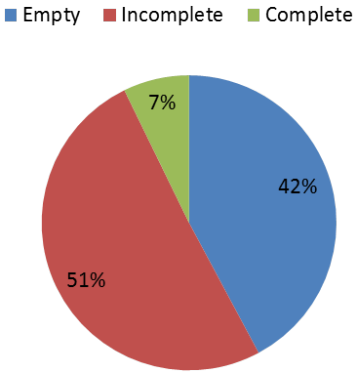
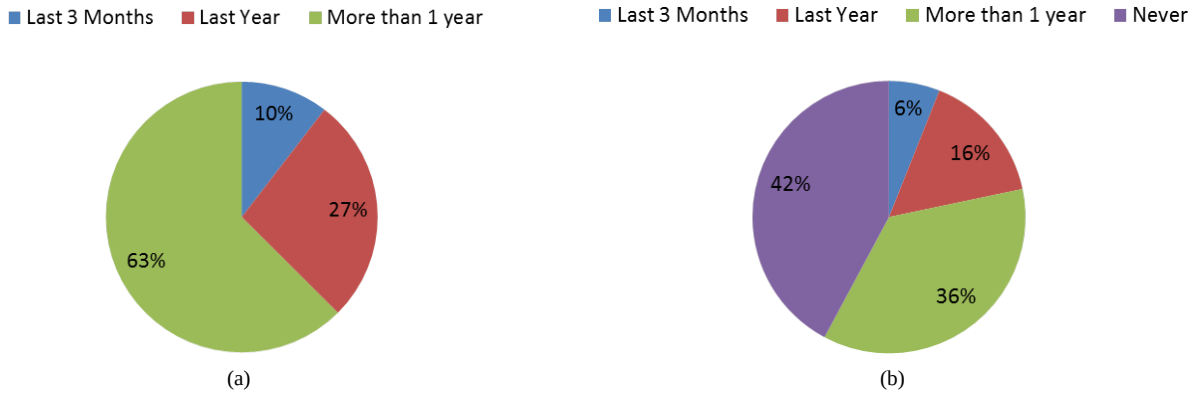


Figure 1. Family history documented on EMR prior to start of study. Each participant's electronic medical record (EMR) was reviewed to determine the completeness of the documented family medical history (FMH) on file prior to the start of the study. The documented FMH was considered "Empty" if there was no documentation of FMH in the allotted section of the EMR, "Incomplete" if there was any documentation of the patient's FMH in the allotted section of the EMR, and "Complete" if there was some description of the health of each first-degree relative of the patient in the allotted section of the EMR.



(a) (b)

Figure 2. Time period in which family history was last updated on the EMR. The patient's electronic medical record (EMR) was reviewed to determine when the documented family medical history (FMH) was last updated: in the past 3 months (February 2011 or later), in the past 12 months (May 2010 to February 2011) or more than one year ago (prior to May 2010). (a) Only includes records that had some documentation of the patients' FMH (described in **Figure 1** to be "Incomplete" or "Complete"); (b) Includes all patient records reviewed, including those that did not contain a FMH for the patient.

3.3. Presence of Significant Medical History

Reviewing the FMH obtained by interview for significant medical history of CAD, DMII, SA, CRC, polyps or HNPCC-associated cancers, it was found that 56 of the 83 participants (67%) had a significant family medical history for at least one of these conditions. Twenty-seven percent of patients (n = 22) had a significant family history of CAD, 29% of patients (n = 24) had a significant family history of DMII, 37% of patients (n = 31) had a significant family history of SA, and 22% of patients (n = 18) had a significant family history of either CRC, HNPCC-associated cancer or polyps (**Figure 3(a)**).

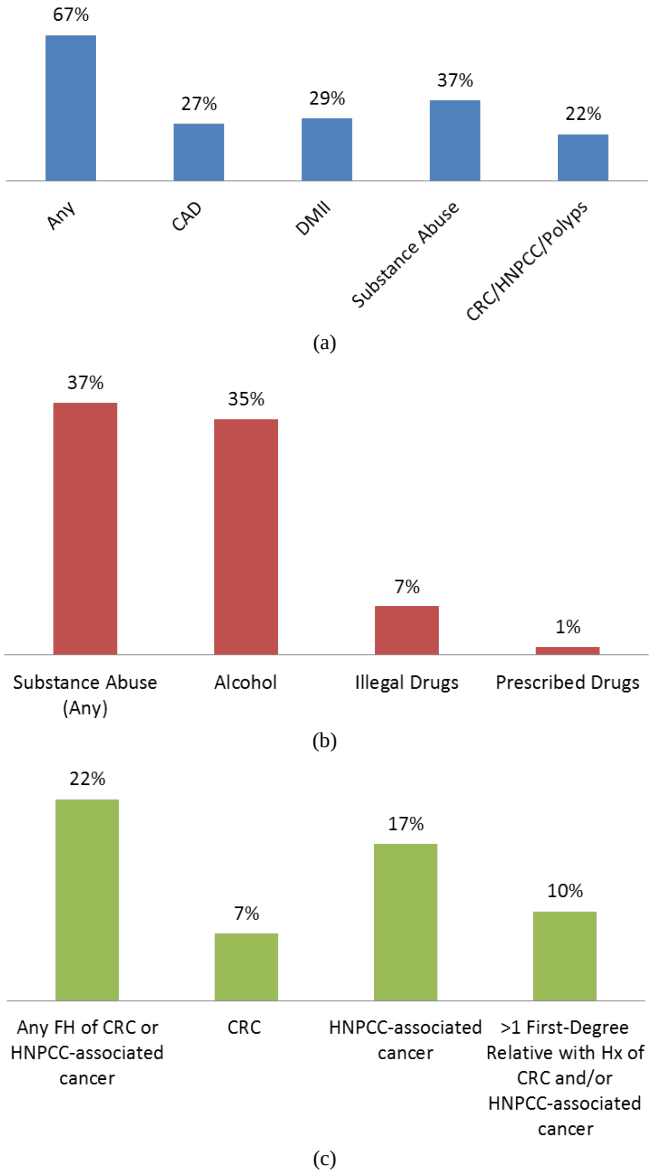


Figure 3. Significant family history. Review of the patient's interviews for a significant family medical history (FMH) of coronary artery disease (CAD), diabetes mellitus type II (DMII), substance abuse, colorectal cancer (CRC), polyps, or cancers associated with hereditary non-polyposis colorectal cancer (HNPCC-associated cancers). (a) Overview of significant family history. A description of how FMH was considered to be significant can be reviewed in the Methods section of this paper; (b) Significant family history of substance abuse. Further categorization of the substance abuse present in each patient's FMH to specify whether history of alcohol abuse, illegal drug abuse and/or prescribed drug abuse were present; (c) Significant family history of colorectal cancer or HNPCC-associated cancer. Further categorization of the history of CRC, polyps or HNPCC-associated cancer in each patient's FMH.

The data regarding SA was further categorized to explore the prevalence of different forms of SA in the family histories of the participants. It was noted that 35% of participants (n = 29) had a significant family history of alcohol abuse, 7% of participants (n = 6) had a significant family history of illegal drug abuse, and 1% of par-

ticipants (n = 1) had a significant family history of prescription drug abuse (**Figure 3(b)**).

The data regarding significant family history of CRC or another HNPCC-associated cancer was also subdivided in order to determine the presence of both groups of conditions individually, and to determine the number of participants that had more than first-degree relative with either of these conditions, as this information is required when assessing a patient's risk of CRC [9]. Seven percent of participants (n = 6) had one or more first degree relatives with a history of CRC, 17% of participants (n = 14) had a history of the HNPCC-associated cancers (excluding CRC) and 10% of the participants (n = 8) had more than one first-degree relative with a history of CRC and/or HNPCC-associated cancer (**Figure 3(c)**).

3.4. Healthcare Practitioners' Perspectives Regarding the Acquisition and Utility of Family Medical History

Of the 42 HCP respondents to the survey, 16 were staff physicians (38%), 20 were residents (48%), 2 were nurse practitioners (5%) and 3 were nurses (7%) at the QFHT (**Table 3**). Eighty-six percent of those that responded (n = 36) stated that they do regularly inquire about the FMH of their patients, while 14% (n = 6) stated they do not (**Figure 4(a)**). To better understand what clinicians considered to be regular inquiry, the HCP were asked how often they inquire about FMH. The majority, 64% (n = 27) stated that they inquired about a patient's FMH at every periodic health examination. Twenty-four percent (n = 10) responded that they inquire about FMH when they considered it clinically appropriate, 12% (n = 5) stated they did so when a new problem presents, 10% (n = 4) inquire about FMH at the initial patient visit, 5% (n = 2) at most or all patient visits, and 2% (n = 1) whenever time allows (**Figure 4(b)**).

Regarding the utility of the FMH, all HCP responded that they considered it to be useful when making clinical decisions, but 40% stated that they only found it useful "some of the time" (**Figure 5(a)**). When prompted to discuss what determines whether they will inquire about FMH in order to assist in clinical decision making, their answers suggested that it often depends on the perceived utility of FMH, such as if knowledge of the FMH affected their screening, investigation or management of a patient. Some also responded that they would inquire if they noted FMH was not already present on the EMR or to assess risk. Other reasons HCP considered it important to obtain FMH were: to further understand the patient's environment and how it may affect his/her health (64%, n = 27), to determine the patient's familial risk for particular conditions (95%, n = 40), and to counsel patients on preventative measures they can take to benefit their own health (79%, n = 33) (**Figure 5(b)**).

When asked to consider barriers to inquiring about FMH, the most common reasons were lack of time (45%, n = 19) or that patients do not come in frequently enough (31%, n = 13). Other reasons were that HCP were unsure what to ask due to lack of clear recommendations (14%, n = 6), concern that the focus of the visit may be lost (10%, n = 4), concern that the patients may not know their family medical history well (10%, n = 4), concern that it may cause the patient unnecessary worry (2%, n = 1), and that it is often forgotten about in the context of investigating an acute condition (2%, n = 1). It should be noted that 36% (n = 15) felt that they do not experience barriers when asking about family medical history (**Figure 6**).

In terms of what HCP stated they asked about when inquiring about FMH, the majority stated that they ask about the specific health issues of each family member (62%, n = 26), as well as targeted questions relating to the patient's current health status (64%, n = 27). Half of the respondents (n = 21) stated that they inquire about the general health of the family of the patient (**Figure 7(a)**).

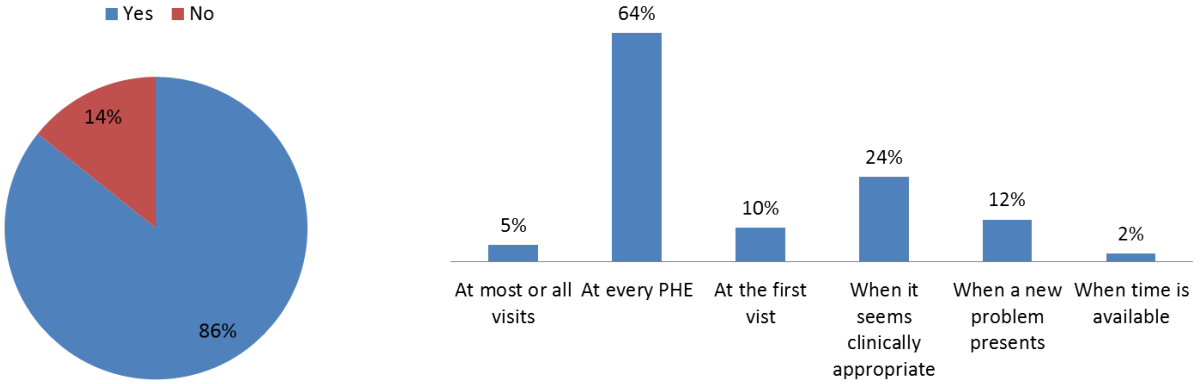
When asked to elaborate regarding which family members the HCP specifically ask about, the majority (64%, n = 27) stated that they inquire about first-degree relatives, including children. Five respondents (12%) stated that they asked about first-degree relatives but excluded children, 12 respondents (29%) stated that they regularly inquire about the health of second-degree relatives and none stated that they regularly ask about the health of third-degree relatives (**Figure 7(b)**).

Differing from what the HCP stated that they included when inquiring about a patient's FMH, the HCP were asked what they think should be included in a complete FMH. The majority agreed that the FMH pertaining to a patient's current conditions should be present (67%, n = 28), the positive and negative history for conditions known to have increased familial risk (74%, n = 31) and the current age or age deceased for each first-degree relative of the patient (55%, n = 23) should be included (**Figure 8**).

Finally, when asked how the acquisition of FMH could be improved, most agreed that developing a questionnaire that could be filled out by the patient while waiting for his/her appointment would be useful (69%, n = 29),

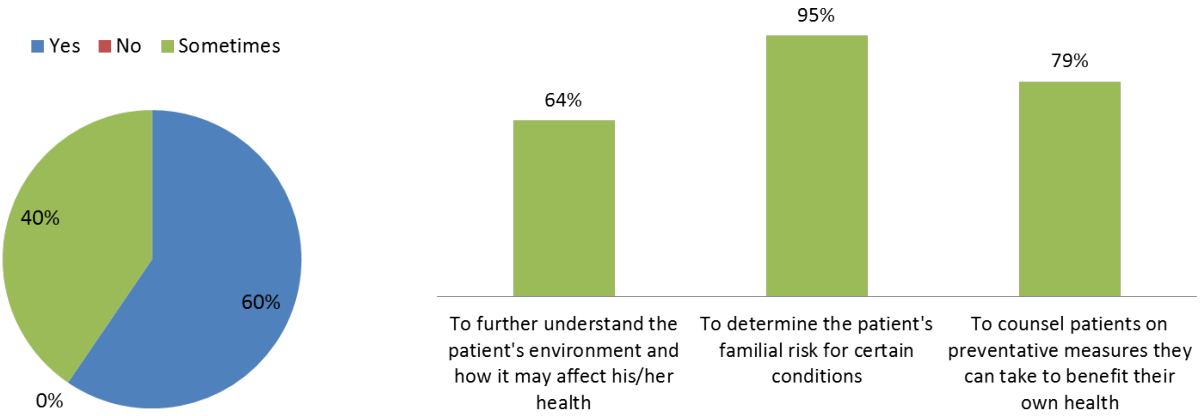
Table 3. Characteristics of the respondents of the healthcare practitioner online survey. Healthcare practitioners working at the Queen's Family Health Team (QFHT) were requested to complete an online survey regarding the acquisition and utility of family medical history (FMH). The demographics of the respondents are shown here.

Title, no. (%)	
Staff Physician	16 (38%)
Resident	20 (48%)
Nurse Practitioner	2 (5%)
Nurse	4 (10%)



(a) (b)

Figure 4. Insight into the regularity of inquiry of family medical history by healthcare practitioners. The following graphs elucidate at what times family medical history (FMH) is solicited by healthcare practitioners' (HCP) from their patients. (a) Proportion of healthcare practitioners surveyed that regularly inquire about family medical history. Self-report; (b) Times at which the healthcare practitioners surveyed inquire about patients' family medical history. Self-report.



(a) (b)

Figure 5. Utilities of family medical history. Healthcare practitioners (HCP) were asked to respond to whether they find family medical history (FMH) useful when making clinical decisions and if there are other utilities to the FMH obtained. (a) Proportion of healthcare practitioners that consider family medical history useful in clinical decision making. Self-report; (b) Utilities of family medical history. HCP were asked to consider specific reasons they find FMH to be useful in clinical care.

though one respondent did comment that a patient-filled questionnaire would not allow for the same HCP-directed patient-specific questioning that would be most useful clinically.

4. Interpretation

To summarize, at the QFHT, the HCP surveyed do consider FMH to be clinically useful and report that they regular inquire into patients' FMH. However, review of patients' records show that FMH is often not docu-

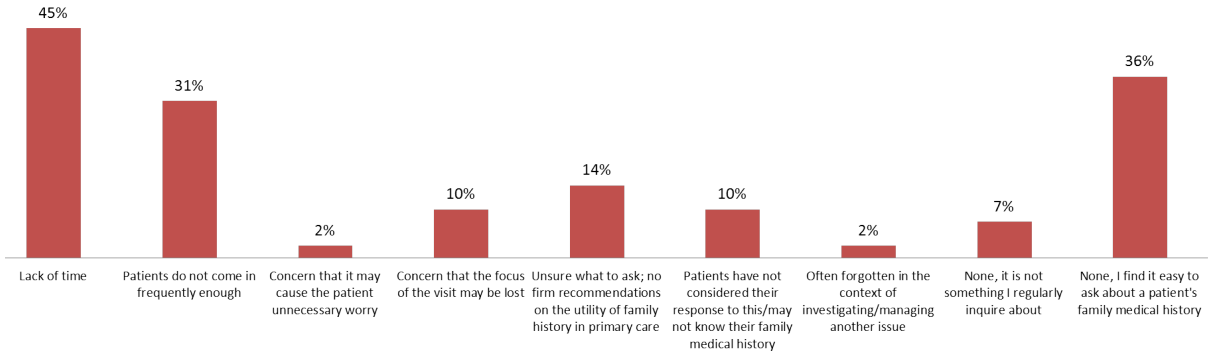
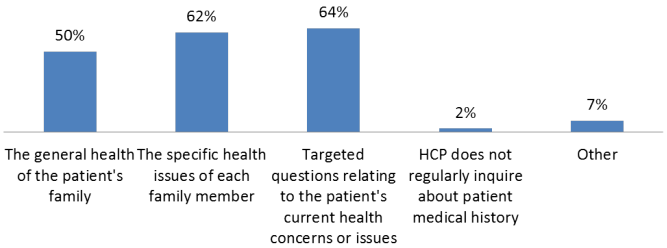
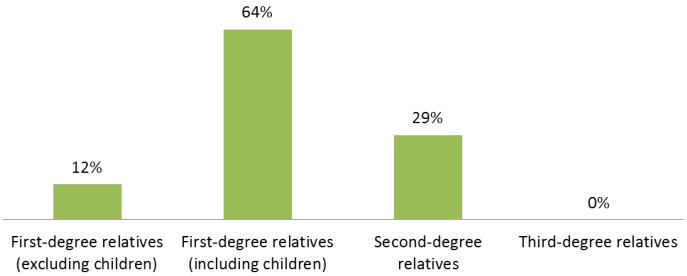


Figure 6. Perceived barriers to inquiring about family history. Healthcare practitioners were asked to consider reasons they may find it difficult to discuss family medical history (FMH) with their patients, or to note if they feel they do not have difficulty discussing FMH.



(a)



(b)

Figure 7. Content of family medical history obtained by healthcare practitioners. Healthcare practitioners (HCP) were asked to self-report what specific information they solicit from their patients when obtaining family medical history (FMH). (a) Healthcare practitioner focus when inquiring about family medical history. Self-report; (b) Family members inquired about by HCP when obtaining family medical history. HCP were asked to report which relatives they regularly requested information about when obtaining FMH from their patients.

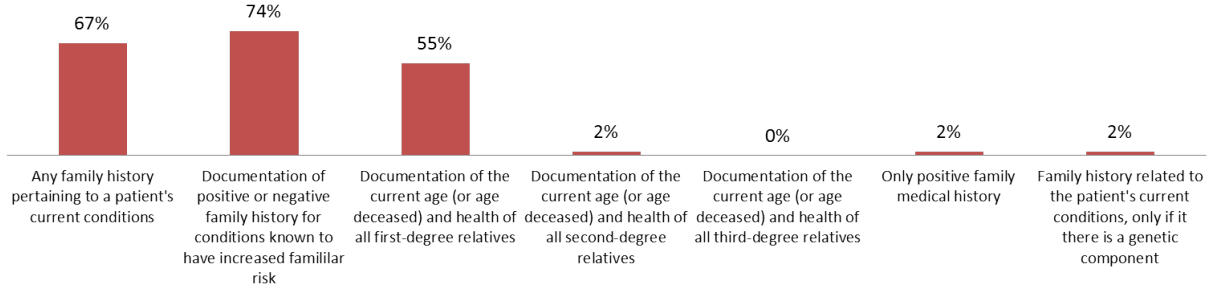


Figure 8. Healthcare practitioner opinions regarding what should be included in the documented family history of a patient. Healthcare practitioners were asked what they thought should be included in a standardized family medical history.

mented and, when it is present, it is rarely complete, meaning that it does not contain health information for each first-degree relative of the patient. This is disparate with the majority of the HCP surveyed agreeing that FMH should include reference to both the positive and negative history for conditions with increased familial risk for first-degree relatives. As well, results of this study also showed that a standardized method of acquiring a general FMH, could lead to alteration in patient care for a variety of diseases (CAD, DMII, SA and CRC).

The findings of this study can be interpreted many ways. In regards to the opposing findings of the self-reported acquisition of FMH by the HCP surveyed, and the lack of FMH documented in patients' records, one explanation is that HCP are simply not inquiring into patients' FMH, despite reporting otherwise. However, a more likely explanation is that information is being obtained, but not documented, which is particularly worrisome given the evolution of primary care.

In the previous construct of primary care in which a single physician was responsible for a patient and had sole access to a patient's record, methods of documentation and decision to omit information was less of an issue in that the physician was aware of his or her own practices. However, in the newer constructs of primary care, such as the family health team [11], any number of HCP could be reviewing and updating a patient record. As such, it becomes essential that information in patient records be clearly documented such that it is recognizable and useable by all who access it. Thus, if this study shows anything in regards to the acquisition of FMH, it is that more standardized documentation of the acquired information is necessary.

In regards to what information must be included in a FMH in primary care, previous studies have provided little recommendation [3]. However, after developing a standardized framework to obtain a general family history for the purpose of this study, using the knowledge that negative family history and information regarding first-degree relatives is most accurate [2], it has been shown that such a framework could yield a significant family history for a variety of diseases leading to the alteration of their management in primary care. Thus, it is the opinion of the authors of this report that this framework could be utilized broadly in primary care settings and for future studies of the utility of FMH in primary care.

While this study has given some insight into the acquisition and utility of family history there are limitations. For one, the study was essentially a pilot study; using a simple, cross-sectional design, focusing on a non-randomized subset of patients at a single center. As well, while the four disease guidelines used to assess FMH [7]-[10] did show utility of FMH to patient management in primary care, these guidelines were merely representative of the wide breadth of guidelines available that should be reviewed in order to better determine which diseases should be asked about directly when obtaining FMH.

5. Conclusion

In conclusion, this study showed that obtaining a standardized FMH can result in altered patient management in a primary care setting. However, at least for the representative practice site assessed in this study, there is a high degree of variability in terms of the documentation of FMH despite many agreed-upon beliefs regarding what should be included in a standardized FMH. Considering all this, future study topics could include: expanding a study like this to multiple centers to confirm the results obtained here, a qualitative study involving the interview of a variety of HCP to fully elucidate how FMH is currently used in primary care and the reasons for the wide variability in documentation, and, most importantly, the development of a family history framework that could be used in a randomized control trial to assess whether its use leads to improved patient outcome in primary care. Only then can the use of FMH truly be considered evidence-based.

Acknowledgements

The authors would like to thank Jyoti Kotecha from the Centre for Studies in Primary Care for her review of the data and recommendations regarding the direction of the project, as well as Danyal Martin from the Department of Family Medicine for her logistical assistance.

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