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"Nature Does Things Well, Why Should We Interfere?": Vaccine Hesitancy Among Mothers

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Abstract

Parents' decision to use vaccination services is complex and multi-factorial. Of particular interest are "vaccine-hesitant" parents who are in the middle of the continuum between vaccine acceptance and refusal. The objective of this qualitative longitudinal study was to better understand why mothers choose to vaccinate—or not—their newborns. Fifty-six pregnant mothers living in different areas of Quebec (Canada) were interviewed. These interviews gathered information on mothers' views about health and vaccination. Almost half of the mothers were categorized as vaccine-hesitant. A second interview was conducted with these mothers 3 to 11 months after birth to look at their actual decision and behavior concerning vaccination. Our results show the heterogeneity of factors influencing vaccine decision making. Although the majority of vaccine-hesitant mothers finally chose to follow the recommended vaccine schedule for their child, they were still ambivalent and they continued to question their decision.

Keywords

decision making; immunization; interviews; longitudinal studies; mothers, mothering

Vaccination is often described as one of the greatest successes in public health history, and vaccination programs are credited for the drastic decline of many vaccine-preventable diseases (VPD; Centers for Disease Control and Prevention [CDC], 2011). Recent outbreaks of VPD in developed countries (Siddiqui, Salmon, & Omer, 2013), linked to under- or non-vaccinated communities, have raised concerns that the public trust in vaccination might be eroding (Larson, Cooper, Eskola, Katz, & Ratzan, 2011). Studies have shown that an individual's decision to use vaccination services is complex and multi-factorial (Brunson, 2013a; Gust, Darling, Kennedy, & Schwartz, 2008). Vaccine decisions are portrayed as "a spectrum of behaviors and beliefs from rejection of all vaccines to active support of immunization recommendations" (Feemster, 2013, p. 1752). Several models of acceptance and resistance, mostly focusing on parental decision making, have been proposed (Benin, Wisler-Scher, Colson, Shapiro, & Holmboe, 2006; K. Brown et al., 2011; Gust et al., 2008). For instance, based on a combination of mothers' actions and attitudes, Benin and collaborators categorized the participants of their study into four categories: the "accepters," who agreed with or did not question vaccination; the "vaccine-hesitant," who accepted vaccination but had significant concerns about vaccinating their infants; the "late vaccinators," who purposely delayed vaccinating or chose only some vaccines; and the "rejecters," who completely rejected vaccination (Benin et al., 2006). Of particular interest for public health are "vaccine-hesitant" individuals who are in the middle of the continuum between vaccine acceptance and refusal and are recognized as more amenable to following public health recommendations about vaccines than vaccine refusers (Opel, Diekema, Lee, & Marcuse, 2009).

Despite the growing number of articles referring to vaccine hesitancy published in recent years (Opel et al., 2012; Rees & Madhi, 2011; Siddiqui et al., 2013), there are some discrepancies among publications about what exactly falls under the umbrella of "vaccine hesitancy."

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The expression has been used to refer to a "gap in parental knowledge" (Rees & Madhi, 2011) or to "reflection and deliberation about the benefits of specific vaccines" (Velan, 2011). The World Health Organization (WHO) has proposed to define vaccine hesitancy as "delay in acceptance or refusal of vaccines despite availability of vaccine services. Vaccine hesitancy is complex and context-specific varying across time, place, and vaccines. It includes factors such as complacency, convenience, and confidence" (The SAGE Vaccine Hesitancy Working Group, 2013).

Much of the research done in developed countries to describe vaccine hesitancy has been based on a quantitative design (Gowda & Dempsey, 2013; Opel et al., 2011; Opel, Taylor, et al., 2013; Smith et al., 2011). Qualitative studies are needed to better understand the causes and expressions of vaccine hesitancy. Qualitative research is useful in describing and making sense of behavior by approaching the behavior in question within the broader socio-cultural context in which individuals live, which is more difficult to achieve using standardized and quantitative tools (Leach & Fairhead, 2007). Using a research design that has already led to interesting and useful results (Benin et al., 2006), we conducted a qualitative longitudinal study to better understand how and why mothers in Quebec (Canada) decide to have their newborn vaccinated or not, with a particular focus on vaccine-hesitant mothers.

Method

Recruitment of Participants

The sample was constituted on a voluntary basis with a focus on recruiting different participants in terms of age, number of children, level of schooling, areas of residence, and so forth. Our goal was to include mothers with different attitudes on the continuum from complete refusal of all vaccines to active demand for vaccination. In Quebec, the large majority of children aged 12 months are completely vaccinated (Boulianne et al., 2013). We thus anticipated difficulties in recruiting vaccine refuser mothers. Results of some studies have shown that births assisted by a midwife were associated with incomplete or non-vaccination in Canada (Guay et al., 2009; Lee, Saskin, McArthur, & McGeer, 2005). Midwifery is publicly funded and practiced in "biomedical" health settings in Quebec. However, midwifery practice in Quebec, which was still unregulated in the 1990s, has emerged at the margins of biomedicine, at the demands of women's groups that fought the "medicalization" of pregnancy and birth and sought to re-appropriate motherhood (Gagnon, 2012). Indeed, some midwives openly question biomedical norms and practices, and the use of complementary and alternative medicine (CAM) therapies—such as herbal medicine, acupuncture, and aromatherapy—is widespread in midwifery practice (Hall, McKenna, & Griffiths, 2012). For this reason, we aimed at recruiting half of the sample among mothers under the care of midwives, despite the fact that less than 5% of pregnant women receive care from midwives in Quebec (Institut de la statistique du Québec, 2012). This purposeful approach was chosen to allow for a better understanding of the phenomenon, focusing on its internal logic, rather than on its generalizability (Glaser, 1992).

Invitations to participate were distributed to pregnant women in 18 clinics offering care for pregnant women (physicians' offices, midwives' offices, gynecologists' offices). Interviews were also conducted with 17 midwives and 13 physicians to assess how they discuss vaccination with patients (Dubé, Vivion, Sauvageau, et al., 2013; Dubé, Vivion, Valderrama, & Sauvageau, 2013). Leaflets presenting the objectives of the study, including an informed consent form, were given by health providers during consultation, by administrative staff at registration, or were left in the waiting rooms. Participation by mothers was voluntary, and a small monetary compensation was given to participants. An informed consent form was signed before the beginning of each interview. Participants were informed about the confidentiality of the interview and the fact that they could stop participation at any moment without giving any justification and without any prejudice or interference in their relationship with their health care provider. No information provided by mothers during the interviews was disclosed to their health care providers. Ethics approval for the study was obtained from the principal author's institution.

Data Collection

The interviews were conducted in two phases, either in person or by phone, according to the participant's preference. Because some studies have shown that mothers begin to think about vaccination during their pregnancy (Glanz et al., 2013; Poltorak, Leach, Fairhead, & Cassell, 2005; Wroe, Bhan, Salkovskis, & Bedford, 2005), the first interviews were conducted with mothers during their second or third trimester of pregnancy. The second interviews were conducted with the same mothers when their child was aged between 3 and 11 months. Because the Quebec childhood vaccine schedule starts at 2 months and ends at 18 months, this allowed us to talk with mothers after they took the decision to have their child vaccinated or not.

Both interviews were conducted using a semi-structured guide. For the first interview, the guide was designed to elicit information about perception of health in general

and of role and responsibilities of parents regarding child's health as well as perception regarding VPD and vaccination. For the second interview, the main themes were mothers' decision about vaccination and mothers' rationale behind their decision. We also elicited information regarding the influence of health professionals, the father, and the broader social network on the decision to vaccinate or not and mothers' satisfaction with their decision and intention regarding future vaccination. The association between use of CAM[1] and non-vaccination among parents on behalf of their children has frequently been observed (Downey, Tyree, Huebner, & Lafferty, 2010; Ernst, 2001; Zuzak, Zuzak-Siegrist, Rist, Staubli, & Simoes-Wust, 2008). In both interviews, questions were asked about CAM use. In Canada, CAM is increasingly used. In the most recent population-wide data, 20% of Canadians aged 12 years or older, or 5.4 million people, indicated that they have used non-traditional or complementary health care during the previous year (Park, 2005). Chiropractors were consulted most frequently (11%), and 2% of respondents had consulted a homeopath or naturopath (Park, 2005).

Interviews were loosely conducted and, in an iterative process, the interview guide was adjusted throughout data collection. For instance, questions could be added in line with events in the actuality, such as a measles outbreak in one area, or in line with a new issue raised by another participant, such as a rumor about vaccines circulating in social media. In addition, the second interview guide was adjusted for each mother based on the data gathered during the first interview.

All interviews were conducted by a research professional trained in anthropology (second author). Participants were recruited and first interviews were conducted until data saturation was reached for the themes of the first interview, that is, when no new ideas emerged during the interviews for the main themes (Cresweel, 2007).

Data Analysis

All interviews were audiotaped and transcribed verbatim. A content analysis of transcribed interviews was done using NVivo 10 software. All transcribed interviews were read by two authors (first author and second author). Data codification was performed by the second author. Data were organized into main coded themes, which followed the interview guide, with a particular focus on vaccination-related themes. In an inductive manner inspired by grounded theory (Charmaz, 2006; Glaser, 1992), emerging themes were created. After coding a few of the verbatim texts, the coding tree was discussed by the authors (first author and second author) and adjusted. Ambiguous verbatim texts were discussed between authors (first author and second author).

After the first interviews, based on the idea that vaccination attitudes should be pictured on a continuum rather than from a dichotomous "pro versus anti" perspective, mothers were divided into three groups according to their attitudes regarding vaccination. "Favorable" mothers were those who were confident about the value of vaccines, who expressed few concerns or questions regarding vaccination, and who expressed the intention to have their child vaccinated. Pregnant mothers who already had other children fully vaccinated and intended to do the same were also categorized as "Favorable." In contrast, "Unfavorable" mothers were those who expressed serious doubts and concerns regarding vaccination and indicated intention to refuse vaccination for their child. Pregnant mothers who already had other children incompletely or not vaccinated and intended to do the same were also categorized as "Unfavorable." "Hesitant" mothers were those who fell in between these two categories, who were unsure and undecided regarding vaccination of their child, or who expressed some doubts and questions, but were not entirely convinced or opposed to having their child vaccinated. Each interview was classified separately by two authors (first author and second author). Discrepancies between the authors' classification were discussed and adjusted.

After the second interview, mothers were divided into three groups according to their decision regarding vaccination of their child. Based on the Quebec vaccination schedule (Ministère de la Santé et des Services sociaux, 2014), the three groups were as follows: mothers who accept all vaccines following the recommended schedule (accept all); those who refuse one or more vaccines, decide to delay vaccination, or both (refuse, delay); and those who refuse all vaccines (refuse all).

All interviews were conducted in French. Quotes provided in the following sections were selected on the basis of their clear representation of the key themes. Quotes were translated into English by a professional translator.

In this study, we used different methodological techniques that were intended to enrich validity: purposeful sampling using diversification criteria, grounded theory, coding by two researchers (Glaser, 1992; O'Reilly & Parker, 2012).

Results

From December 2011 to April 2012, 56 pregnant women were recruited and interviewed. Interviews lasted between 35 and 90 minutes (M = 53 minutes). Participants were between 10 and 38 weeks pregnant (M = 23 weeks). Second interviews took place from August 2012 to March 2013. No participant was lost to follow-up. However, one mother lost her child after the first interview and was excluded from the study. The 54 post-partum interviews

Table 1. Demographic Characteristic of Participants and Attitudes at First Interview.

Demographic Characteristics	*n*	Attitude at First Interview		
		Favorable	Hesitant	Unfavorable
Mothers' age at first interview				
≤25	5	2	3	
26–30	26	12	11	3
31–34	16	6	7	3
≥35	8	4	4	
M age (years)	30			
Education level of mother				
High school or less	6	3	2	1
College	21	9	12	
University	28	12	11	5
Pregnancy under care of				
Physician	26	15	10	1
Midwife	29	9	15	5
Number of children				
First pregnancy	14	2	12	0
One other child	22	12	7	3
2–3 other children	19	10	6	3

conducted by phone or face-to-face lasted from 20 to 90 minutes (M = 40 minutes). One second interview was conducted by email exchanges. At the time of the second interview, children were aged between 3 and 11 months (M = 6 months).

Description of the Sample

Demographic characteristics of participants are presented in Table 1. There were no differences in mothers' attitudes regarding vaccination based on their age between the three groups (favorable, hesitant, and unfavorable). However, there were more vaccine-hesitant mothers among primipara mothers. Vaccine-hesitant and unfavorable mothers were generally more educated than vaccine-favorable mothers. As expected, there were more vaccine-hesitant and unfavorable mothers who were under the care of midwives (Table 1).

Mothers' Perspective on Health and Prevention

Vaccine-favorable. The 24 mothers categorized as favorable after the first interview considered health as the absence of disease and being healthy as being able to do all activities of daily life. Healthy eating, physical activities, and having friends and family support were elements that these mothers considered essential to "being healthy." Most favorable mothers said that they were following governmental advice regarding healthy habits, for themselves and their family. When asked about their perceptions of infectious diseases, these mothers saw such diseases as important in "building up" the immune system. The emphasis on hygiene, disinfectants, and cleaning was even denounced by some participants. Vaccination was part of this vision of the immune system and favorable mothers considered it helpful in building up children's immune systems without them having to suffer from the disease. Vaccination was seen as safe and effective and a good and easy way to prevent disease.

> I think that you need to be exposed to a certain quantity of pathogens to develop immunity for sure, to develop antibodies, . . . for example, with vaccination, it's diminished, it's inactive, and that lets us develop antibodies and not the disease, which is neat. (Vaccine-favorable, multipara)

These positive opinions were based on trust in the recommendations of public health authorities and health professionals regarding vaccination.

> It seems to me that if they give us all these vaccines, it's because it's been studied and thought-out, it's logical. I do not think that the MSSS (Ministry of Health) or the public agency or whoever, I'm not sure who manages everything, but whoever manages it all, . . . I think that if they give them out, it's because they all have their uses at some point or other in the child's life. . . . I do not trust blindly, but I say to myself, someone has thought about all this, a doctor, and I do not think that it's too much. (Vaccine-favorable, multipara)

Only 2 vaccine-favorable mothers were primipara. All other children of the 22 multipara women were fully

vaccinated, according to the recommended schedule. For their current pregnancy, 15 mothers were under the care of physicians (family physicians or obstetrician-gynecologists), and 9 were under the care of midwives. At the time of the first interview, few mothers recalled having discussed vaccination with their health professionals and for those who did, these discussions were fairly general and did not really influence their intention to vaccinate. Of note is the fact that most vaccine-favorable mothers had already consulted practitioners of CAM, such as osteopaths, acupuncture specialists, or homeopaths, but these approaches were considered as complementary to traditional biomedical medicine. In contrast, the 7 vaccine-favorable mothers who had not used CAM generally perceived these approaches as ineffective or useless.

Vaccine-unfavorable. Six mothers were categorized as vaccine-unfavorable. These mothers had a functional vision of health similar to vaccine-favorable mothers. They also considered healthy eating, physical exercise, and good sleeping habits as important components of a healthy lifestyle. They did not disagree with most recommendations from public health authorities on healthy habits. Like vaccine-favorable mothers, vaccine-unfavorable mothers shared a vision of the immune system as something that needs to be built up. They all saw infectious diseases as essential to developing their child's immune system. However, in contrast to vaccine-favorable mothers, they perceived natural immunity, that is, immunity from diseases, as better than immunity conferred by vaccines. Some argued that the children's bodies are able to handle infectious disease and this was especially true for children living a healthy lifestyle.

> Well, yes, once again, to develop the immune system you need to have certain diseases and afterwards, you're stronger and you develop antibodies. . . . Not everyone dies from measles and in some of the things I've read, they say that measles is a childhood disease that all children should have and that it`s a good disease for building up the immune system. Of course, there can be complications and it can be fatal. (Vaccine-unfavorable, multipara)

Generally speaking, vaccine-unfavorable mothers considered vaccination as ineffective and unsafe, and even dangerous. These mothers argued that vaccines do not cover all types of viruses and that vaccinated children still catch VPD, which shows that vaccines are not effective. They considered that natural immunity is lifelong and were highly skeptical about the duration of protection conferred by vaccines. Other mothers considered that VPD do not exist anymore, so vaccination is unnecessary. Vaccine safety was their main concern and they highlighted the unknowns concerning the long-term effects of vaccination.

> We know that there are lots of children who get vaccinated but who get sick anyway . . . And there are a lot of those diseases that no longer exist or have almost been eliminated, and now, the vaccines they give, because now they`ve added some, you know, chickenpox, nobody dies from chickenpox, it's a disease that kids catch and it gives them spots and it itches for a week, which is no fun, but it goes away and after that, the body is immunized for life. Now we know that someone who takes the vaccine, well, in fact, we do not how long the vaccine stays active, we just do not know. (Vaccine-unfavorable, multipara)

In addition, vaccine-unfavorable mothers showed a high level of distrust of public health authorities concerning vaccination. They argued that pharmaceutical lobbying influences the results of research on vaccination. All vaccine-unfavorable mothers already had other children. Only one of these children was partially vaccinated and the eight other children were completely unvaccinated. Five out of six vaccine-unfavorable mothers were under the care of midwives for their current pregnancy and all were using CAM. In addition, these mothers were generally doubtful regarding traditional biomedical medicine and some were using CAM almost exclusively (one mother being a CAM practitioner). These mothers reported having discussed vaccination with CAM practitioners and the purpose of these discussions was generally to look at alternatives to vaccination.

Vaccine-hesitant. After the first interview, 25 mothers were classified as hesitant regarding vaccination. Like vaccine-favorable and vaccine-unfavorable mothers, these mothers had a functional vision of health. Like other mothers, they saw the immune system as something that needs to be built up. However, they were more ambivalent regarding the role of vaccines in building up the immune system. Many had a slight preference toward natural immunity and some of them were very uncomfortable with the idea of injecting an "artificial product" into the "pure bodies" of children.

> We say that nature works wonders, so why go against nature, nothing is lacking in our environment, it's just fine the way it is. For my part, I know when my child was born, we had the choice of having a little bit of cream in the eyes, a little bit of this, a little injection for that. Right from the moment of birth, and even before, there are various interventions that can be done. . . . I didn't accept any of them. I figure that my child is okay, everything is okay, there are no particular risk factors present, so no thanks, do not do anything, he's just fine. (Vaccine-hesitant, primipara)

> I have doubts about what it can do to the brain, what it can even do to the immune system. There are more and more diseases but people are no longer able to fight off anything,

you know, I think it's important to be sick in the sense that it doesn't kill you, it makes you stronger. (Vaccine-hesitant, multipara)

Vaccine-hesitant mothers were quite ambivalent regarding vaccination. They were unsure about vaccine effectiveness. Although they were conscious of the benefits of vaccination programs in eradicating some diseases, they also thought that vaccination was not necessary for other diseases. They had doubts regarding the duration of protection conferred by vaccines. Generally, these mothers considered "old vaccines" as safe, but were more concerned by new vaccines—such as the varicella or rotavirus vaccines—that they perceived as less safe or useful. These mothers did not completely reject vaccines or accept them as a whole. Rather, they considered vaccines one by one, trying to decide the benefits and risks for their own child. At the time of the first interview, some mothers were already planning to refuse one or more vaccines.

For vaccination, I find that it's hard to judge if it's really going to improve your child's health because there are a lot of vaccines for diseases that do not exist anymore, and there are other vaccines that are very new so we do not really know what effects they might have in the long term. (Vaccine-hesitant, multipara)

Beyond their uncertainties about vaccination, these mothers were also doubtful regarding the role of public health authorities. Some of them expressed distrust toward governmental recommendations, mostly because of perceived collusion with pharmaceutical companies.

Some of the reasons for my reticence toward vaccination come from the fact that vaccines are produced by drug companies that have yes, interest in health but, above all, commercial interests, anyway, that's how I look at drug companies. (Vaccine-hesitant, multipara)

Many vaccine-hesitant mothers were looking for information on vaccination from different sources and many criticized the lack of "balance" or "neutral" information on vaccination.

One way or the other, when my homeopath tells me that my daughter is going to have cancer, because it looks like we are going to get cancer from being vaccinated or my family doctor, well my family doctor doesn't do that, or other people or the government tell me that people are still dying because there weren't vaccinated. . . . all that, for me, one side or the other, I really have a problem with that and that's why I haven't made a decision yet, I have a hard time accepting that information. (Vaccine-hesitant, primipara)

Some vaccine-hesitant mothers considered that CAM practitioners were more credible than public health authorities because they had "nothing to gain" by dismissing vaccination while governments were perceived as having a hidden agenda when promoting vaccination.

The chiropractor won't get anything. I do not really see what advantage people would have to promote ideas against vaccination except for their personal opinion and the fact that they really believe it, they do not get any economic advantage. (Vaccine-hesitant, multipara)

Out of 25 hesitant mothers, nearly half of them were primipara. Most of these mothers said that they lacked knowledge to make "the right decision." Many of these mothers wanted to search out specific information on each vaccine and VPD and indicated that they would "look into it to make an informed decision." Thirteen vaccine-hesitant mothers were multipara. For their first child, 6 mothers had accepted all recommended vaccines and followed the schedule, whereas 6 mothers had refused some vaccines (namely, varicella and rotavirus vaccines) or delayed vaccination. None of those mothers had refused all vaccines for their older children.

Among vaccine-hesitant mothers, 15 were under the care of physicians during their current pregnancy and 10 under the care of midwives. Most of these mothers reported use of CAM, namely, homeopathy and acupuncture. Of the 5 mothers who did not use CAM, none were opposed to it in principle and some of them would have consulted CAM practitioners if they had the money to pay for these consultations.

Vaccination Decision

Figure 1 presents mothers' attitudes regarding vaccination (first interview) and mothers' decisions regarding vaccination (second interview).

Among vaccine-favorable mothers, 21 accepted all recommended vaccines according to the schedule for their children. Two multipara mothers refused the rotavirus vaccine for their children, but accepted all others. One multipara mother delayed vaccination unintentionally, because she forgot to make the appointment.

Interviewer (I): And why you did not give the rotavirus vaccine?

Participant (P): Because it is a live vaccine, I thought that the risk of being contaminated by the stools was greater that the danger of catching gastroenteritis. And the fact that it's a new vaccine as well, I know they're doing studies on it, but I was uncomfortable with it anyway. As well, I didn't know that this new vaccine had come out, and they presented it to us right at the moment of vaccination and we had to make a decision immediately (laughs). So that's why, without much time to think about it and the fact that I was uncomfortable, I decided not to have him vaccinated. (Vaccine-favorable, multipara)

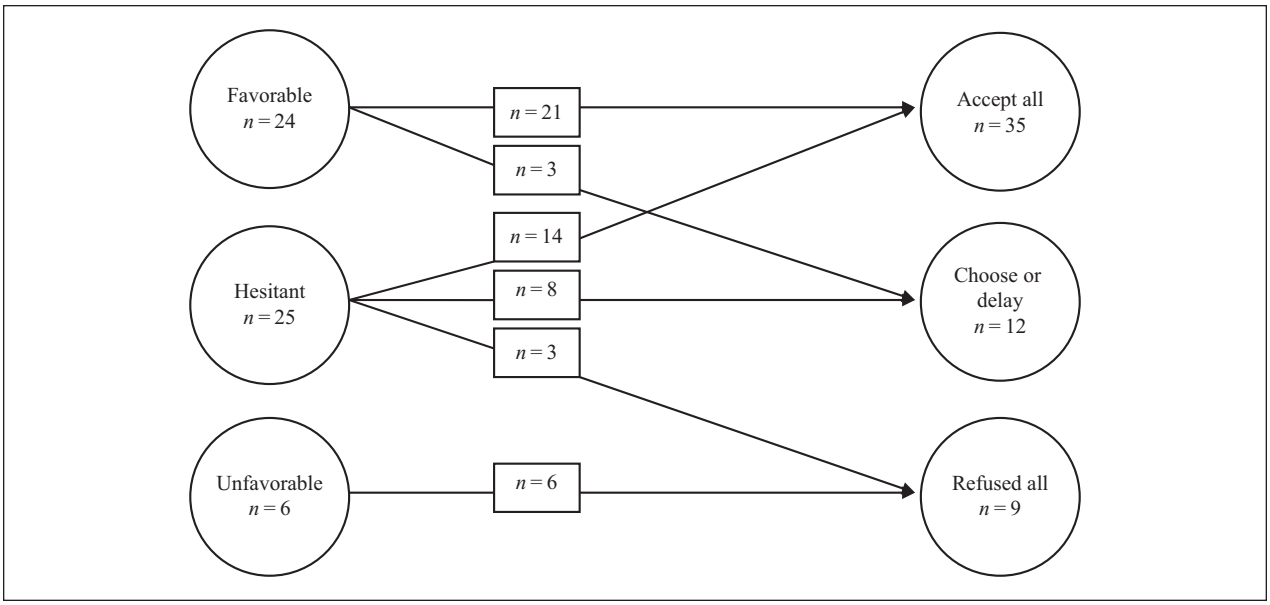

Figure 1. Mothers' attitudes at first interview and mothers' decision at second interview.

All vaccine-favorable mothers were satisfied with their decision about vaccination and none reported any bad reactions by their child after vaccination. None of the mothers felt they had a bad vaccination experience and none of the children experienced serious adverse events after vaccination.

In contrast, all vaccine-unfavorable mothers refused all vaccines for their child and were satisfied with this decision.

More than half of vaccine-hesitant mothers decided to have their child vaccinated with all recommended vaccines according to the schedule. Eight decided to refuse some vaccines or to delay vaccination and three refused all vaccines for their child. Vaccine-hesitant mothers' decisions were always context-specific, based on the family situation. Different factors have influenced the decision to vaccinate or not, such as the opinion of the other parent, a bad reaction of the first child to vaccination or plans to travel to developing countries, fear of VPD transmission from older children, conversation with family members and friends, and so forth.

> I: After having looked at all this information, what has influenced the most your decision to vaccinate?
> P: Uh . . . It is the experiences of my friends, my close friends that also have children. . . . The influence of the group, the influence of everyone who is doing it. (Vaccine-hesitant mother, multipara)

> It's because last time, she was sick, . . . she had a cold, and the cold was almost over and we went to get the vaccine then, wow, it started again and lasted a long time, and she had otitis and a runny nose all the time. So, was it that or not that, except that I've heard from others that after getting the vaccine, the same thing happened, and that's why I thought it could be because of that. (Vaccine-hesitant, multipara)

Vaccine-hesitant primipara mothers were more likely to accept all vaccines (9/12) compared with multipara hesitant mothers (5/13). Some multipara hesitant mothers took the same decision that they had made for their other children, whereas others made a different one; some who had refused vaccination for their first child decided to vaccinate their youngest and vice versa. Indeed, many multipara mothers were classified as hesitant because they find it difficult to make a decision regarding vaccination, even if they already have gone through this process for their other children.

> I find it's a difficult choice to make because I think if I vaccinated my oldest child and I do not vaccinate my second one and then, unfortunately, my second one is sick more often than my first, I'll say to myself, that's it, I should have vaccinated him, but I still won't be any better informed, so I have the feeling that it's going to be the same thing. I'll get him vaccinated with the same vaccines. So I think yes, I'll get him vaccinated, but maybe not for the right reasons [laughs]. (Vaccine-hesitant, multipara)

In addition, at the time of the second interview, vaccine-hesitant mothers who followed the recommended schedule for their child were not convinced that they had made "the good decision." Three of them even said that they were not sure they would pursue vaccination, noting that they could change their mind at any moment. For

Table 2. Main Factors Influencing Mothers' Decision About Vaccination.

To accept all vaccines following the recommended schedule	• To protect the child from catching VPD, fear of VPD • Anticipated regret if the child catches a VPD • Because it is the "normal thing to do," vaccination as a social norm • Pressure to vaccinate (from family, spouse, friends, etc.) • Trust in health professionals' recommendation • Because the child is at particular risk of VPD (i.e., older siblings, will go to day care, etc.) • To protect others, to prevent the spread of VPD in the community
To refuse one or more vaccines and/or to delay vaccination	• As a "trade-off" position between refusing all and accepting all vaccines • Disease perceived as mild (mostly for rotavirus vaccine) • Fear of adverse events (to refuse some vaccines)/fear of diseases (to accept some vaccines) • Because it is a new vaccine (mostly for rotavirus vaccine) • Feeling of guilt/pressure to vaccinate (to accept some—all vaccines with a delayed schedule or not) • Bad experience with vaccination for the child/for others in the social network • Fear of multiple injections at the same visit • Advice/information on "alternative vaccination schedule"
To refuse all vaccines	• Perception that vaccines are unsafe and ineffective • Preference for natural immunity • Perception that risk associated with vaccination is higher than risk of VPD • Preference for other modes of protection (e.g., homeopathic vaccines)

Note. VPD = vaccine-preventable diseases.

instance, following a bad experience after a vaccination visit, one hesitant mother had sent an email to the research team saying that she would not pursue vaccination, except for booster doses. Furthermore, many hesitant mothers, who accept all recommended vaccines, expressed specific concerns regarding the varicella vaccine, which is given at 18 months in Quebec. Similar concerns regarding the varicella vaccine were also voiced by hesitant mothers who choose or delay vaccines.

In summary, few vaccine-hesitant mothers, whether they accept, delay, or refuse vaccination, were totally satisfied with their decision. This decision was always considered as "non-final," that is that they were still thinking about it and could re-consider vaccination at any moment.

> I'm still unsure. I always wonder if I've made the right choice, but I think it's part of being a parent to wonder, to always question our choices because we, . . . if it should happen that I do not take the right decision, what will the repercussions be for my daughter. If she got diphtheria, I would feel terrible for not getting her vaccinated. I think that if I get her vaccinated one of these days I'll feel a bit better and I'll tell myself, well, everyone does it, so I'm joining the crowd, I will have done my best. But at the same time, in 50 years, if they realize that there are problems with vaccination, with certain vaccines. I do not know, no, I'm not really comfortable with the decision. (Vaccine-hesitant, primipara)

The main factors that influence vaccine decision making, independent of the mothers' position at first interview, are listed in Table 2.

Health Professionals' Influence on Vaccination Decision

Vaccine-favorable mothers. All vaccine-favorable mothers recalled having discussed vaccination with health professionals following their pregnancy (whether it was a midwife or a physician). They were also generally satisfied with these discussions, but most mothers felt that these discussions did not have a very big influence on their overall opinion and intention regarding childhood vaccination. No differences in mothers' opinion were found between mothers under the care of physicians and those under the care of midwives.

Most vaccine-favorable mothers reported having mainly discussed vaccination with the nurse at the vaccination clinic. Mothers generally described their experience as positive, saying the nurse adequately answered their questions, gave appropriate documentation on vaccines, and explained the vaccines that were administered. However, some felt pressured by the nurse to vaccinate.

Vaccine-unfavorable mothers. All except one of the vaccine-unfavorable mothers were under the care of midwives. These mothers also discussed vaccination with their midwife or physician, and most of them also reported having had this discussion for their first child. Vaccine-unfavorable mothers were generally satisfied with the discussion about vaccination they had with their midwife, mostly because the midwife remained neutral and respected their intention to refuse vaccination. "She just let me make my own mind up. She said, it's okay if you

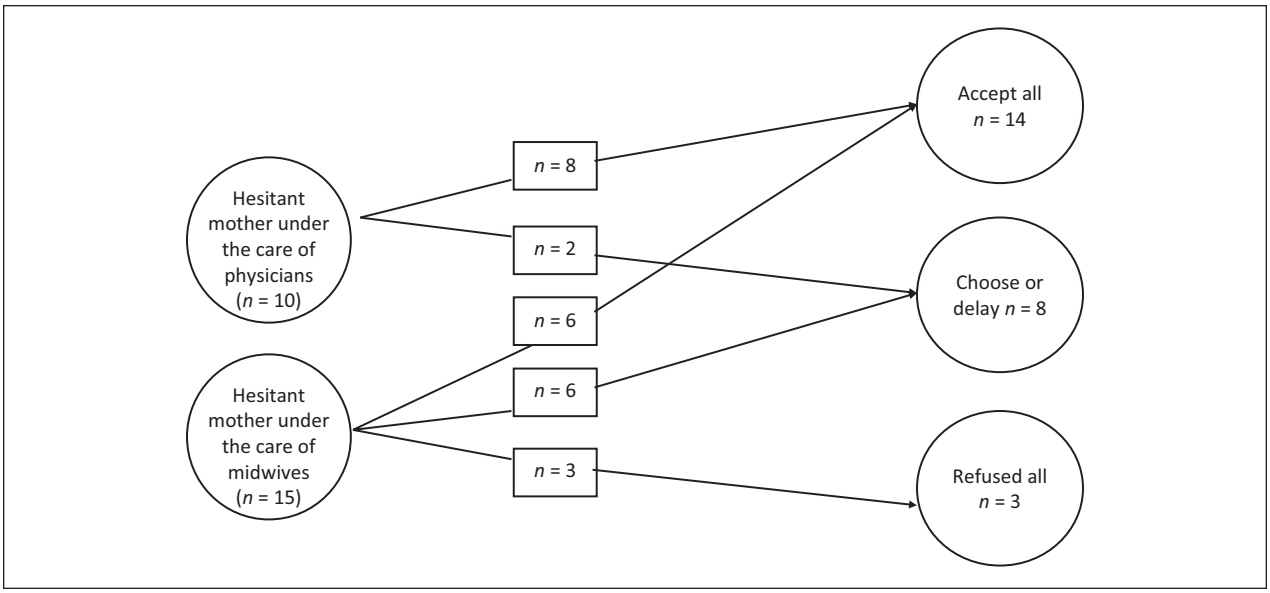

Figure 2. Vaccine-hesitant mothers' decisions and type of care.

do not vaccinate, it was quick, it took 30 seconds, that's all" (Vaccine-unfavorable, multipara).

However, discussions about vaccination with physicians were not perceived as positive for most vaccine-unfavorable mothers; one mother even decided to stop being treated by her physician. Most vaccine-unfavorable mothers did not want to discuss vaccination with health professionals, mostly out of fear that their position would be perceived negatively. Some mothers did recall having been judged by health professionals during routine medical consultations, whereas it was not the case for others.

Vaccine-hesitant mothers. Some differences in vaccine decision making among vaccine-hesitant mothers under the care of physicians versus midwives were observed (see Figure 2). Most of the mothers under the care of a physician discussed vaccination only at the time of the first vaccination visit at 2 months, whereas mothers under the care of a midwife usually discussed vaccination at the end of the pregnancy. Some mothers recalled that their midwife told them that vaccination was "a choice" and that there was "no rush to vaccinate." Mothers reported different types of written information provided by their midwives, ranging from locally created documentation showing the "pros and cons" of vaccination to naturopathic books or "official" public health documentation. Midwives with a more neutral approach to vaccination seem to have strengthened vaccine-hesitant mothers' intention to delay vaccination while they had limited influence on other mothers' decisions.

> At the last meeting, at 6 weeks postnatal, we were asking ourselves a lot of questions and so we didn't really discuss whether we should vaccinate, against what, and so forth, but I had a call from the CLSC (Local Health Care Center) nurse shortly after the birth to offer their services and to talk to me about vaccination, so we discussed this call and I said, what do I do if the CLSC nurse tells me to come in for the vaccination and she tells me that well, here in Quebec, you're quite free to say that you're thinking about it and that you'll get back in touch with them when you're ready. In fact, that's what I answered . . . and the midwife just lets me realize that yes, we are free to say no. She didn't tell me to say no, but at least to say wait, I'll get in touch, and that's what we did, we got back in touch with the CLSC recently. (Vaccine-hesitant, multipara)

Except for the three who refused all vaccines, vaccine-hesitant mothers also discussed vaccination with the nurses who administer vaccines. More than half of these mothers considered their experience as positive and felt that the nurses gave them appropriate documentation, were comforting and caring, and were non-judgmental of their choice to refuse one or more vaccines.

> P: I had a really great nurse who made it easy for me, it went really well.
> I: Did this nurse answer your questions?
> P: Oh yes, I do not remember exactly what my questions were (laughs), but I remember that she gave me good information, that she reassured me and that she also gave me a bit of literature at that moment.
> I: And how did you feel about asking questions?
> P: I felt at ease, she was a very sympathetic person with photos of her own children in the office, so I felt like I was in another mum's office. (Vaccine-hesitant primipara)

In contrast, about one third of these hesitant mothers felt they were poorly treated by nurses at the vaccination

clinic. Some felt they were pushed to accept vaccination or felt a time constraint and did not have enough time to ask their questions during the visit. Some mothers felt confused, saying they received conflicting information from their midwives and from the nurse. Finally, some also felt that their decision to refuse vaccines or to delay vaccination was judged negatively by the nurse.

> For the first vaccine, I was pretty disappointed because up until then, I had been looked after by a midwife who took the time to explain things well, that this thing is for that, that you have the choice, this does that, and then, when you get into the nurse's office, she's got two needles, show me your thigh, bang, bang, and what's that for, well, that's the way it is, you know. (Vaccine-hesitant, primipara)

Discussion

Studies looking at factors associated with parental acceptance of different childhood vaccines have shown that parents' decision to use or avoid immunization for their children is a complex behavior dependent on many factors (K. F. Brown et al., 2010; Falagas & Zarkadoulia, 2008; Quadri-Sheriff et al., 2012). Various social cognitive models, such as the Health Belief Model (HBM) or the Theory of Planned Behavior (TPB), have been used to explain variation in parental acceptance of vaccines. According to the TPB (Ajzen, 1991), human action is guided by three elements: a favorable or unfavorable "attitude toward the behavior" (e.g., perceived safety and efficacy of vaccines), perceived social pressure or "subjective norm" (e.g., perception that the majority of parents vaccinate their children), and perceived barriers and enabling conditions or "perceived behavioral control" (e.g., perceived ease to get the child vaccinated; Dube et al., 2012; Ogilvie et al., 2007; Wheeler & Buttenheim, 2013). The HBM, which was originally developed in the 1950s to look at barriers to polio vaccination among parents (Rosenstock, 1974), is based on four psychosocial domains: perceived susceptibility to and seriousness of VPD, perceived efficacy of vaccines, and concerns and influences that facilitate or discourage vaccination (Morin, Lemaitre, Farrands, Carrier, & Gagneur, 2012; Smith et al., 2011; Taylor & Cufley, 1996).

Many determinants identified in these studies also played a role in the decision-making process of the mothers in this study. For instance, perceived risks of VPD and perceived efficacy of vaccines were associated with vaccine acceptance while the perception that risk associated with vaccination was higher than risk of VPD contributed to vaccine refusal. However, in many quantitative studies based on social cognitive models, the determinants of vaccination decisions are presented as discrete and measurable variables, without regard to the "processes and pathways" leading to vaccination acceptance or refusal (Nichter, 1995). The contribution of this study is to provide an in-depth description of the complex and interrelated factors influencing mothers' decision.

Results of this study indicate that vaccine-favorable and vaccine-unfavorable mothers generally have a clear stance on vaccination and act accordingly. Vaccine-unfavorable mothers refused all vaccines for their child. In contrast to some experts' explanation, their decision was not thoughtless, irrational, or resulting from a lack of knowledge about vaccination. As has already been shown by the results of other studies, vaccine refusing mothers were well-informed individuals with considerable interest in health-related issues and who actively seek information (Burton-Jeangros, Golay, & Sudre, 2005; Kennedy, Lavail, Nowak, Basket, & Landry, 2011; Kitta, 2012; Leach & Fairhead, 2007). Their opposition to vaccination was rooted in strong beliefs regarding health, diseases, and prevention that could be labeled "holistic," "natural," or "alternative."

At the other end of the spectrum, vaccine-favorable mothers generally followed the recommended vaccine schedule and felt confident in doing so. They were motivated by the desire to protect their child from VPD and trusted public health recommendations. However, of note is the fact that some vaccine-favorable mothers did refuse the new rotavirus vaccine that was introduced into the Quebec childhood vaccination schedule in 2011. Previous studies have already demonstrated that new vaccines usually engender more hesitancy, especially when they are aimed at VPD perceived as "mild" (Freed, Clark, Butchart, Singer, & Davis, 2010; Siddiqui et al., 2013).

In between these two groups, almost half of the mothers interviewed in this study were classified as vaccine-hesitant. Some of these mothers chose to delay vaccination, whereas others decided to refuse one, two, or all vaccines for their child. Approximately half of the vaccine-hesitant mothers finally did follow the recommended vaccination schedule. However, despite having accepted all vaccines in a timely fashion, these mothers still had important concerns regarding vaccination and felt that they could change their minds at any time. In addition, rather than being "for" or "against" vaccination as a whole, these mothers looked at each vaccine independently. Most of them also thought about vaccines in terms of their own child rather than from a public health, universal approach to vaccination. Two other ethnographic studies have also shown that most parents consider the risk of a VPD or of side effects of vaccines, not from a population-based perspective as in epidemiology, but rather based on their perceptions of their own child's health and vulnerabilities (Leach & Fairhead, 2007; Poltorak et al., 2005).

Findings of this study also illustrate the preponderant influence of social networks on vaccine-hesitant mothers' decisions, which has also been illustrated in other studies

(K. F. Brown et al., 2010; Brunson, 2013b; Hilton, Petticrew, & Hunt, 2007; Petts & Niemeyer, 2004; Tickner, Leman, & Woodcock, 2006). Most of the hesitant mothers, who were unsure and had many doubts about vaccines, reported that people in their social networks helped shape their opinions about vaccination. Mothers who finally decided to delay immunization or to refuse one, many, or all vaccines often acknowledged that their decision was triggered by negative stories or advices against vaccination received by people they respect or with whom they identify. Conversations with these people could have played a key role in bringing up concerns and doubts about childhood vaccination. In contrast, vaccine-hesitant mothers who finally decided to give all recommended vaccines to their child often recalled positive influence of their partner or spouse, friends, or family members. Findings of our qualitative study also strengthened the influence of health professionals on parental vaccination decisions. Many studies have shown that one of the main predictors of acceptance of a vaccine is a recommendation for vaccination by a health care professional (Ridda et al., 2008; Schmitt et al., 2007; Stefanoff et al., 2010). For instance, results of a large U.S. study indicated that the largest proportion of parents who changed their minds about delaying or not getting a vaccination for their child listed "information or assurances from a health care provider" as the main reason (Gust et al., 2008). In our study, many vaccine-hesitant mothers who received information and recommendations from nurses or physicians felt reassured and decided to vaccinate their child. However, a few vaccine-hesitant mothers did agree to vaccinate because they felt pressured to do so by the nurses or the physicians and were still having important doubts and concerns about vaccines.

In our study, vaccine-hesitant mothers were actively looking for "nuanced," "value-neutral" information on vaccination to make "the right decision." Public health or governmental information was perceived by vaccine-hesitant mothers as "too pro," whereas the critical information of anti-vaccination groups was perceived as "too anti." In their quest for "balanced" information, some vaccine-hesitant mothers were turning to CAM practitioners, because their recommendation was seen as more credible than those of public health experts, nurses, or physicians because CAM practitioners were seen as "having nothing to gain or lose" when talking about vaccination. However, rather than being neutral, previous studies have shown that information on vaccination from CAM sources generally emphasizes the risk of vaccination rather than its benefits (Wheeler & Buttenheim, 2013). Consulting CAM practitioners could have a negative impact on vaccine acceptance and many quantitative studies have found a statistically significant association between CAM use and non-vaccination (Busse, Walji, & Wilson, 2011; Downey et al., 2010; Jones, Sciamanna, & Lehman, 2010). In our study, many hesitant mothers who decided to refuse or delay vaccination were relying more or less heavily on CAM. More research is needed to look at how CAM and biomedical providers communicate with parents about vaccines and to assess the potential impact that the communication strategies used could have on the parents' vaccine attitudes and decisions (Bryant, Wesley, Wood, Hines, & Marshall, 2009; Opel et al., 2014; Opel, Heritage, et al., 2013).

It is also important to note that many primipara mothers were classified as vaccine-hesitant and most of them finally did vaccinate their child according to the schedule. In that sense, vaccine hesitancy could be considered "normal" and could reflect mothers' critical appraisal of information regarding vaccination as a valuable and essential step in a shared decision-making process about vaccination. This should not come as a surprise given the rise in consumerism, in which individuals are empowered to play an active role in health care decision making (Lupton, 1997). However, the fact that some multipara mothers were still hesitating about vaccines, despite having already taken a decision regarding the vaccination of their older children, might indicate that these mothers have more doubts and concerns than primipara mothers.

Results of this study illustrate that vaccine-hesitant parents should not be considered as a homogeneous group when it comes to attitudes regarding vaccination. As for the overall continuum of vaccine acceptance–rejection, there are different levels or degrees of vaccine hesitancy. For instance, in looking at vaccine hesitancy among prenatal parents, it is important to distinguish parents who, in a valuable informed decision-making process, have questions and want more information before making their decision from parents who are more critical and doubtful about vaccination.

Furthermore, the results of our study indicate that vaccine hesitancy might not be a transitory state. In fact, many vaccine-hesitant mothers, regardless of their decision, indicated that they were not entirely comfortable with their decision and could change their minds at any time. This is well illustrated by the fact that vaccine-hesitant multipara mothers took different vaccine decisions for their newborn than for their older children. Other primipara mothers also felt they did not have had enough time to gather all the information about vaccines they would have wished to have—mostly because of the short period of time between delivery and the first planned vaccination visit at 2 months. The first weeks with a newborn are characterized by important changes and adaptation, especially for new parents, which is not well suited for information-seeking. This might also explain, at least partially, why many vaccine-hesitant mothers were still unsure about their vaccination decision.

This study has strengths and limitations. First, as for all studies relying on qualitative interviews, social desirability bias—which is the tendency of respondents to reply in a manner that will be viewed favorably by others—cannot be excluded. However, the fact that interviews were conducted by a research professional from the anthropological field should have reduced this bias. Second, the sample of participants was constituted on a voluntary basis, which could lead to a selection bias. Indeed, even if saturation of data was attained, results of this study cannot be extrapolated to all mothers in Quebec. Generalizability is further limited by the fact that half of the interviewed mothers were under the care of midwives, whereas in fact less than 5% of pregnant women are under the care of midwives in Quebec. However, this approach has allowed us to generate rich findings on vaccine-hesitant mothers. Despite limitations to the study's generalizability, we have provided a wealth of data on the vaccine decision-making process of mothers that could not have been provided through a quantitative study. Furthermore, because of the gap between intention and behavior, the longitudinal design used in this study strengthens the study's findings, especially because no participants were lost to follow-up.

Conclusion

All mothers interviewed in this study wanted the best protection for their child's health, and it is essential to understand why this means accepting vaccination for some and refusing or delaying vaccination for others. In between vaccine-favorable and vaccine-unfavorable mothers, vaccine-hesitant mothers formed a heterogeneous group with different levels of indecision and concerns about vaccination. Results of our study have illustrated that, more than a rational "risk versus benefit" analysis, mothers' decisions encompassed different factors such as social norms, past experiences, emotions, values, social network influences, and other day-to-day concerns about their child's health and well-being.

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Note

1. Defining the vast and constantly shifting complementary and alternative medicine (CAM) scope of practice and the boundaries that separate it from biomedicine is a complex undertaking. CAM is often defined by what it is not: It is not taught in medical schools, not reliant upon the paradigm of biomedical concepts, not practiced in conventional hospitals, not scientifically proven, and so on (Ernst, 2001). The National Center for Complementary and Alternative Medicine (NCCAM) in the United States proposes the following definition of CAM: "A group of diverse medical and healthcare systems, practices, and products that are not generally considered part of conventional medicine. Conventional medicine is medicine as practiced by holders of M.D. (medical doctor) and D.O. (doctor of osteopathic medicine) degrees and by allied health professionals, such as physical therapists, psychologists, and registered nurses. The boundaries between CAM and conventional medicine are not absolute, and specific CAM practices may, over time, become widely accepted" (National Center for Complementary and Alternative Medicine, 2012).

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