PEER REVIEW HISTORY

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ARTICLE DETAILS

TITLE (PROVISIONAL)	Parents' Vaccination Information Seeking, Satisfaction with, and Trust in Medical Providers in Switzerland: A Mixed-Methods Study
AUTHORS	Tarr, Philip; Ebi, Selina; Deml, Michael; Jafflin, Kristen; Buhl, Andrea; Engel, Rebecca; Picker, Julia; Häusler, Julia; Wingeier, Bernhard; Krüerke, Daniel; Huber, Benedikt; Merten, Sonja

VERSION 1 – REVIEW

REVIEWER	Reich, Jennifer University of Colorado Denver
REVIEW RETURNED	16-Aug-2021

GENERAL COMMENTS	I have reviewed the manuscript, ""We have so much information that we can get lost in it": A Mixed-Methods Study on Parents' Vaccination Information Seeking, Satisfaction with, and Trust in Medical Providers in Switzerland." The goal and contributions of the paper, which appear to affirm long-known information about vaccine hesitancy—including information in the literature review of the paper—are unclear. This study has interesting mix methods data, which potentially could bring qualitative and quantitative data on both providers and patients' parents into dialog. However the findings provide very long quotes only from parents that are not used strategically to advance any major analytical point. The authors seem to show that there is not a lack of health literacy among parents who are vaccine hesitant (a fact mentioned as already known from literature) and that providers remain a trusted source of information (also well known and even promoted on the US CDC page). Thus, it is unclear what we learn. In short, the authors need to set up the gap in knowledge more clearly to make a contribution. The authors begin with disagreement about health literacy, which sets up the paper to be rather limited in scope. The more nuanced mechanisms that potentially reveal how parents' efforts to identify some information as relevant appears to foreclose other information could possibly be more fruitful. Understanding provider attitudes or taking a more dyadic analysis could also shed light on the processes by which parents come to think through vaccine decisions, change their ideas, or become increasingly committed to their pre-existing views. Additionally, since this focuses on CAM, one would expect the nuances of CAM to play a bigger analytical role. Related, there is also reason to question whether all providers are in fact promoters or supporters of vaccines. Ward et all in France point to some hesitancy among providers as does

	the 2019 Wellcome Report. There are important questions to ask about the role of providers that introduce some variation across providers and within interactions. Notably, some providers negotiate with parents. Others don't. Some may even discourage certain vaccines for certain children. Rich qualitative data can help tease out these variations. The paper does mention "provider browsing," which again, is not a new topic or phenomenon and is well described in the VH literature. The authors should cite what is known already on this front. Additionally, they may wish to consider what resources make changing providers possible and easy for some, including time, money, race, marital status, and education level. More importantly, this topic appears to be a different one from that of health literacy and information seeking. Its inclusion suggests the authors need to be clearer on the paper's core goals. I believe the authors have interesting data and hope they are able to identify unique contributions in the field, which would allow them to make a novel contribution. Whether it is about national or practice context, views of CAM providers and varied support for vaccines, or other dynamics, the authors should more clearly identify key gaps and aim to fill them.

REVIEWER	Holzmann-Littig, C. TUM Medical Education Center
REVIEW RETURNED	07-Nov-2021

GENERAL COMMENTS	I read the manuscript with great interest. It uses a mixed methods approach to examine various factors that may be associated with veccine hesitancy. This is particularly important in today's world, considering that COVID-19 vaccination may soon be available for children in Europe as well. Nevertheless, I have a few comments and would ask the authors to address them. Title: The title is appropriately chosen, but very long. Can it be split into a short title and a subtitle? Introduction: The abbreviation VH is used for both vaccine hesitancy and vaccine hesitant, which is confusing. The abbreviation should only be used for one term. Materials/Methods: How exactly were parents selected? Was the number of parents per part of Switzerland roughly equivalent to the proportion of the population of that part of the country in the total population, i.e., for example, were parents from certain parts of the country disproportionately interviewed? How many parents were excluded? How many parents were contacted? In the quantitative part, we talk about a questionnaire on the one hand and telephone interviews on the other. In these questions, were only the questionnaires gone through or were the interviews partly open-ended?

	The original questions of the questionnaire should be disclosed in a supplemental table. Lines 201 and 202: on what basis was the decision made whether a source was critical? Was there a catalog for this? Vaccination records were consulted, as far as I understood correctly. Also, were the children of hesitant parents actually less vaccinated? Results: The pseudonyms could (depending on how they are chosen) allow inferences or else suggestions about the nature of the person. I recommend the use of subject numbers, as this is neutral. In the results section, sometimes VH parents are mentioned first and sometimes non-VH parents are mentioned first. Standardization would make it clearer. Line 381: The physician name does not appear to be pseudonymized. It should be anonymous to not allow inference to the subjects. Discussion: Line 426/427: It is not entirely clear to me how the authors arrive at the thesis that VH parents have been pushed. This should be explained in more detail. Line 453: What efforts ould be made to gain trust? How should physicians try to develop a trsuting atmosphere? Do the authors have suggestions about information that should be disseminated on social media, i.e., where many of the participants get their information? The overall discussion is well written but lacks a link to the current situation. The results should be discussed especially in the current time in light of the COVID-19 pandemic and the partial lack of vaccination willingness.

VERSION 1 – AUTHOR RESPONSE

Reviewer #1:

Major Comments.

* Comment 1: The goal and contributions of the paper, which appear to affirm long-known information about vaccine hesitancy—including information in the literature review of the paper—are unclear. […]
I believe the authors have interesting data and hope they are able to identify unique contributions in the field, which would allow them to make a novel contribution. Whether it is about national or practice context, views of CAM providers and varied support for vaccines, or other dynamics, the authors should more clearly identify key gaps and aim to fill them.

Response: We agree with defining the goals of the manuscript more precisely and thank the reviewer for making suggestions on how we could make a novel contribution to the literature. We have therefore reduced the focus on health literacy (see comment 3) and the focus on the provider being the most trusted source of information. Additionally, we have delved more into the topic of CAM services (see comments 2 and 4).
We have clarified the novelty of our paper as follows:

Section 4.2: “Building upon existing literature, our study provides evidence demonstrating how VH parents can be characterized by their lower levels of satisfaction and trust, and that this may be an important basis for a vicious circle of information seeking, dissatisfaction, distrust, and VH, as previous studies have shown the importance of trust when it comes to addressing VH [9, 43, 44]. Furthermore, there is a need to examine decision-making on childhood vaccinations and under-immunization among VH parents in countries where little research has been conducted [2]. It is therefore important that research provides context-specific insights on Switzerland, due particularly to its high CAM use [11] and high rates of VH [28]. The focus on Switzerland, the large-scale data on the questions of VH, and the study’s mixed-methods approach speak to the novelty of this research.”

* Comment 2: This study has interesting mix methods data, which potentially could bring qualitative and quantitative data on both providers and patients’ parents into dialog. However, the findings provide very long quotes only from parents that are not used strategically to advance any major analytical point.

Response: We agree that some quotes are long. We aimed to portray parents’ experiences with information sources and healthcare providers (particularly medical doctors) when making vaccine decisions, what sources they consult, and how they respond to these sources/information in terms of trust and satisfaction. We have shortened/paraphrased some quotes for readability.

As for the second point, we agree, and have added the following evidence:

Section 3.3:
*Qualitative evidence particularly showed the saliency of the issue of trust for parents in their vaccination decision-making process. The following except from an interview with Mrs. Godet, a 29-year-old mother of a 13-month-old fully vaccinated daughter illustrates how, despite the mother’s media-induced uncertainty about her vaccination decision, trust in the provider was crucial for her to follow the provider’s recommendation:
There are a lot of so-called 'scientific' studies which have come out with consequences that vaccines might have on children's health. […]. And so it's very hard to know who to believe, actually. […]. So, we trust, anyway. Well, I trust my pediatrician. So, if she tells me that I have to vaccinate, I think that's good. Now, it's true that if you read a little bit of what's on the Internet and everything, you don't really know what to do.

Providers also discussed how they fostered trust as part of their clinical practice. Dr. Heffelfinger, an anthroposophic physician, explained how he thought his practices differed from those of a biomedically oriented pediatrician:
I try to take much more time and try to make something out of the time. To gain trust, to create insight to the subject. […]. To me, the free decision to vaccinate is the top priority. The decision belongs to the human being that decides for himself or herself.”

* Comment 3: The authors seem to show that there is not a lack of health literacy among parents who are vaccine hesitant (a fact mentioned as already known from literature) and that providers remain a trusted source of information (also well-known and even promoted on the US CDC page). Thus, it is unclear what we learn. In short, the authors need to set up the gap in knowledge more clearly to make a contribution.
[…]

The authors begin with disagreement about health literacy, which sets up the paper to be rather limited in scope.

Response: As mentioned further up, we agree and have cut the discussion about health literacy in order to make space to highlight the new points and to add clarity to the arguments of the paper.

* Comment 4: The more nuanced mechanisms that potentially reveal how parents' efforts to identify some information as relevant appears to foreclose other information could possibly be more fruitful. Understanding provider attitudes or taking a more dyadic analysis could also shed light on the processes by which parents come to think through vaccine decisions, change their ideas, or become increasingly committed to their pre-existing views.

Response: We agree. An important aspect of our mixed methods study includes recruitment of parents in medical providers' offices, with qualitative interviews being done with both parents and providers, in addition to observations of vaccination consultations. Some of our qualitative findings, however, have already been published (Deml et al, Social Science and Medicine 2019; Deml et al, Social Science and Medicine 2020; and Deml et al, Sociology of Health and Illness 2021 – our references [1, 2, 3]). While no longer novel, our qualitative data are the background on which we develop the quantitative study design and the rationale behind the present manuscript. We now have added the following sections in the literature review and methods:

Section 1: "[…] Research consistently shows how trust in and satisfaction with providers who promote vaccination increases parental vaccine acceptance, while parents being misunderstood, criticized, or alienated when expressing VH in clinical interactions can have a negative impact on vaccination acceptance [9]. Ceasing to consult with a health care provider [24, 25] and, related, the phenomenon of doctor "shopping" (which we refer to as browsing) [26], have previously been described as important expressions of patient dissatisfaction. Some of our qualitative data analysis has particularly demonstrated how issues of trust, satisfaction, affect, and choice played determinative roles, not only in parents' vaccination decisions, but also in the types of vaccination sources and the choices of healthcare practitioners (i.e., biomedical or CAM) with whom they consult for their children's cares [25]. […]"

Section 2.4: "[…] The final questionnaire included PACV items, questions gathering sociodemographic information about the parents and the target child, and additional questions informed by our previously published qualitative research investigating CAM provider approaches to vaccination consultations [27] , biomedical provider descriptions of interactions with VH parents and dilemmas faced when addressing vaccine hesitancy and refusal [36], and VH parents' navigation of information sources and consultations with CAM and biomedical providers [25]. These qualitative studies informed the design of several components of the quantitative survey, particularly including questions on the parent-provider relationship and vaccination information sources. […]"

* Comment 5: Additionally, since this focuses on CAM, one would expect the nuances of CAM to play a bigger analytical role.

Response: We agree and have added considerations about CAM nuances to the literature review (see below) and quotes from CAM providers to the qualitative results (see comment 2).

Section 1: "Some of our qualitative data analysis has particularly demonstrated how issues of trust, satisfaction, affect, and choice played determinative roles, not only in parents' vaccination decisions, but also in the types of vaccination sources and the choices of healthcare practitioners (i.e., biomedical or CAM) with whom they consult for their children's cares [25]. The nuances of CAM vaccination counselling resulting in higher trust and satisfaction most likely lie within these providers

taking time for discussion, incorporating parents into decision-making, and taking parents' concerns seriously [27]."

However, as mentioned above, the nuances of CAM communication techniques and vaccination counselling were already explored and described in detail in previously published manuscripts (our references [1, 2, 3]). We have detailed this better in the introduction of the revised manuscript.

* Comment 6: Related, there is also reason to question whether all providers are in fact promoters or supporters of vaccines. Ward et all in France point to some hesitancy among providers as does the 2019 Wellcome Report. There are important questions to ask about the role of providers that introduce some variation across providers and within interactions. Notably, some providers negotiate with parents. Others don't. Some may even discourage certain vaccines for certain children. Rich qualitative data can help tease out these variations.

Response: We agree that providers, too, can be vaccine-accepting or vaccine-hesitant. We have reported in a separate manuscript how none of the biomedical providers in our study were vaccine-hesitant, and that among our CAM providers approximately 65% vs 35% were VH vs non-hesitant (Jafflin K et al, manuscript under review – our reference [4]).

Comment 7: The paper does mention "provider browsing," which again, is not a new topic or phenomenon and is well described in the VH literature. The authors should cite what is known already on this front. Additionally, they may wish to consider what resources make changing providers possible and easy for some, including time, money, race, marital status, and education level. More importantly, this topic appears to be a different one from that of health literacy and information seeking. Its inclusion suggests the authors need to be clearer on the paper's core goals.

Response: We agree and have added discussion about provider browsing in the introduction (see below). As described above, we have removed the topic of health literacy (see comment 3).

Section 1: "[…] Research consistently shows how trust in and satisfaction with providers who promote vaccination increases parental vaccine acceptance, while parents being misunderstood, criticized, or alienated when expressing VH in clinical interactions can have a negative impact on vaccination acceptance [9]. Ceasing to consult with a health care provider [24, 25] and, related, the phenomenon of doctor "shopping" (which we refer to as browsing) [26], have previously been described as important expressions of patient dissatisfaction. Some of our qualitative data analysis has particularly demonstrated how issues of trust, satisfaction, affect, and choice played determinative roles, not only in parents' vaccination decisions, but also in the types of vaccination sources and the choices of healthcare practitioners (i.e., biomedical or CAM) with whom they consult for their children's cares [25]. […]"

Reviewer #2:

* Comment 1: The title is appropriately chosen, but very long. Can it be split into a short title and a subtitle?

Response: Since we slightly changed our focus according to the above criteria and suggestions of Reviewer #1, we felt that the quote in the title ("We have so much information that we can get lost in it") was no longer entirely appropriate. Accordingly, we removed the quote and have changed and thereby shortened the title, as follows:

Title: “Parents’ Vaccination Information Seeking, Satisfaction with, and Trust in Medical Providers in Switzerland: A Mixed-Methods Study”

* Comment 2: The abbreviation VH is used for both vaccine hesitancy and vaccine hesitant, which is confusing. The abbreviation should only be used for one term.

Response: It is correct that we use the abbreviation VH for both the adjective vaccine hesitant and the noun vaccine hesitancy. The reason lies primarily within the word count, which applies especially in the abstract. We believe that readers will understand the different meaning of the VH abbreviation, as we clarify the ambiguity in the abbreviations section in the following way:

Abbreviations: “Vaccine hesitancy or vaccine hesitant (VH)”

* Comment 3: How exactly were parents selected?

Response: We now clarify participant recruitment (Deml et al, BMJ open, 2019 – our reference [5]) in the methods as follows:

Section 2.4: “For the study’s quantitative component, we recruited parents in waiting rooms of participating providers’ offices [28]. We refer to these providers as the primary providers. “

And we clarify the criteria for participation in section 2.1: “We interviewed parents throughout German, French and Italian-speaking Switzerland. […]. At the time of the survey, the interviewed parent was >18 years of age and their child was 0-11 years old.”

* Comment 4: Was the number of parents per part of Switzerland roughly equivalent to the proportion of the population of that part of the country in the total population, i.e., for example, were parents from certain parts of the country disproportionately interviewed?

Response: We now set this out in the methods:

Section 2.1: “We interviewed parents throughout German, French and Italian-speaking Switzerland. The French-speaking part, with approximately 23% of the Swiss population and about 19% of our parental study sample, was slightly underrepresented, and the Italian part was slightly overrepresented (8% of the Swiss population and 18% of study parents) [30, 31].”

* Comment 5: How many parents were excluded? […] How many parents were contacted?

Response: As part of a national research program (Deml et al, BMJ open, 2019 – our reference [5]), our study examined not only parental VH around childhood vaccination, but also VH concerning HPV vaccination. We collected the response rates for the total number of participants of the quantitative study component, including adolescent participants interviewed regarding HPV vaccine. The overall attrition rate, i.e. the difference between participants (including adolescents) giving informed consent and the participants with who an interview was successfully conducted, was 40%. The attrition rate was certainly higher among the adolescents than among the parents.

* Comment 6: In the quantitative part, we talk about a questionnaire on the one hand and telephone interviews on the other.

Response: For clarification, we have added the following to the reporting of quantitative participant recruitment:

Section 2.4: “For the study’s quantitative component, we recruited parents in waiting rooms of participating providers’ offices [28]. We refer to these providers as the primary providers. The questionnaire, however, was administered during a telephone interview conducted after office hours from January 2019 to April 2020 [28].”

* Comment 7: In these questions, were only the questionnaires gone through or were the interviews partly open-ended?

Response: The questionnaires were quantitative, i.e., closed questions with predefined answers. However, to some questions, we added the option of free text answers. For example, when parents said they used the Internet as a trusted source of information, we then asked, “Which Internet sites?". The corresponding answers were noted in “free text” and analyzed in detail. We now describe this in the methods:

Section 2.4: “A key question posed to parents was "What are your most trusted information sources on vaccination?" to which a series of pre-established response options were made available (e.g., "Internet".) We invited participants to provide additional information through open-answer responses (e.g., "Which websites?"). The number of sources mentioned by each participant was analyzed by coding and counting the reported sources, as well as the free-text answers.”

* Comment 8: The original questions of the questionnaire should be disclosed in a supplemental table.

Response: We agree and have added three supplemental files (Supplementary_questionnaire_S2.xlsx for the quantitative part; Supplementary_questionnaire_S3.docx and Supplementary_questionnaire_S4.docx for the qualitative part) which contain the original questionnaires.

* Comment 9: Lines 201 and 202: on what basis was the decision made whether a source was critical? Was there a catalog for this?

Response: As explained in the footnote to Table 2 and in the methods (see both below), we personally consulted all sources mentioned by the parents and evaluated as a team whether they should be considered critical of the official Swiss vaccination recommendations or not.

Section 2.4: “We personally reviewed the information sources cited by parents and, after consultation within the team, we decided whether to consider each source as critical or accepting of the official vaccination recommendations.”

Section 3.2, Table 2, Note: “2Print media, websites, organizations, TV programs, and films that are critical of or consistent with public health vaccination recommendations based on our detailed assessment and on consensus among research team members”

* Comment 10: Vaccination records were consulted, as far as I understood correctly.

Response: Yes, whenever possible, participants provided a copy of the child’s vaccination record. We have clarified this information in the methods section, as follows:

Section 2.1: “We asked parents to provide us with a copy of their children’s vaccination record.”

* Comment 11: Also, were the children of hesitant parents actually less vaccinated?

Response: Yes, and we have published these findings in two separate papers (Olarewaju et al, Human Vaccines & Immunotherapeutics, 2021; Olarewaju et al, Human Vaccines & Immunotherapeutics, 2021 – our references [6, 7]). A detailed analysis of the relation between parental VH, provider VH, and delay of childhood vaccines is under review (Jafflin K et al, Vaccine, submitted – our reference [4])

* Comment 12: The pseudonyms could (depending on how they are chosen) allow inferences or else suggestions about the nature of the person. I recommend the use of subject numbers, as this is neutral.

Response: We acknowledge the possibility of a potential association of named pseudonyms with stigmatization in terms of attitude and values of that person according to the country of origin, for example. Nevertheless, it is a common practice in the restitution of qualitative data to include pseudonyms to improve the readability of manuscripts. We adhere to these practices and prefer this format for stylistic purposes. It is clear in section 2.5 where we state that “Pseudonyms are used for participants throughout”.

* Comment 13: In the results section, sometimes VH parents are mentioned first and sometimes non-VH parents are mentioned first. Standardization would make it clearer.

Response: We agree and have now adjusted the order accordingly throughout the manuscript.

* Comment 14: Line 381: The physician name does not appear to be pseudonymized. It should be anonymous to not allow inference to the subjects.

Response: In fact, all names mentioned are pseudonyms, as stated in section 2.5: “Pseudonyms are used for participants throughout”.

* Comment 15: Line 426/427: It is not entirely clear to me how the authors arrive at the thesis that VH parents have been pushed. This should be explained in more detail.

Response: We agree this needs to be clarified and have added the following sentences to the respective paragraph in the revised manuscript:

Section 4.1: “Previous research suggests that the relationship between VH and CAM use is not fully explained by VH individuals’ trust in CAM services, but rather by distrust in biomedicine [15]. Accordingly, we argue that the VH parents in our sample may have been more likely to be pushed away from biomedicine than pulled toward CAM, as VH parents seemed to switch providers when they were no longer satisfied with or no longer fully trusted their provider, therefore substantiating not primarily the attractiveness of the second provider, but rather a form of dissatisfaction with the initial provider.”

* Comment 16: Line 453: What efforts could be made to gain trust? How should physicians try to develop a trusting atmosphere?

Response: These are important questions, and we therefore now provide additional discussion, as follows:

Section 4.3: “Since providers remain the number one source of both VH and non-VH parents, we argue that providers can undergo vaccine consultation and communication training to engage more effectively in dialogue about vaccination with patients. Parents, especially VH parents, do not always lack facts but also may lack certainty, trust, and satisfaction toward the information they obtain as well as in their medical provider. Previous literature shows that parents showing reluctancy towards childhood vaccination are not necessarily poised to reject vaccination. Such reluctancy is rather a result of uncertainty and doubt acquired through conflicting information [27]. It is important that the provider does not hastily label or even exclude those patients, but rather views them as patients with doubts or concerns and with potential for productive dialogue. If hesitant parents’ questions are not adequately addressed and concerns are not met with understanding, distrust and dissatisfaction can arise. In these instances, parents may engage in provider browsing, information browsing, and engage in behaviors that might increase their VH.”

Nevertheless, we point to the core message of this manuscript being that VH parents are less trusting, less satisfied with their sources and with the provider as the primary source, and the resulting provider browsing and information browsing. The nuances of individual vaccination counselling from CAM providers, which seem to instill trust and satisfaction, are primarily discussed in our previous publications (see [1, 2, 3]).

* Comment 17: Do the authors have suggestions about information that should be disseminated on social media, i.e., where many of the participants get their information?

Response: It is probably not beneficial to provide more or better-quality information, as we see that parents do not lack information. Rather, there is a need for the provider to be a trusted resource, to contextualize the often conflicting information available, to take the time to answer questions that parents may have, and, based on the information parents obtained, to help parents make a decision that is right for them. We have added the following to the discussion:

Section 4.3: “Since providers remain the number one source of both VH and non-VH parents, we argue that providers can undergo vaccine consultation and communication training to engage more effectively in dialogue about vaccination with patients. Parents, especially VH parents, do not always

lack facts but also may lack certainty, trust, and satisfaction toward the information they obtain as well as in their medical provider. Previous literature shows that parents showing reluctancy towards childhood vaccination are not necessarily poised to reject vaccination. Such reluctancy is rather a result of uncertainty and doubt acquired through conflicting information [27].”

* Comment 18: The overall discussion is well written but lacks a link to the current situation. The results should be discussed especially in the current time in light of the COVID-19 pandemic and the partial lack of vaccination willingness.

Response: We are aware that we do not address Covid-19 pandemic in the context of our results and discussion. We do so deliberately because we wish to refrain from linking childhood vaccination with SARS-CoV-2 vaccination. Childhood vaccines are an intensively researched preventive measure for decades, with, for example, the feared complication of autism as a consequence of MMR vaccination being scientifically disproven [8]. Vaccine hesitancy towards childhood vaccination is a phenomenon that has been around for a long time and has accordingly been able to develop socioculturally. In contrast, hesitancy toward the SARS-CoV-2 vaccine is novel, is probably based on different reasons, and is particularly emotionally charged in the context of the social divide. We are therefore reluctant to project our results onto the Covid-19 pandemic. We have commented on this in the manuscript:

Section 4.4: “Given the current sociocultural tension surrounding the Covid-19 pandemic, a thorough analysis of the underlying factors and potential intervention measures of widespread VH about the SARS-CoV-2 vaccine is needed. It will also be important for researchers to examine how issues of trust and satisfaction around Covid-19 vaccination services might be associated with routine childhood vaccinations and the influenza vaccination.”