Perceptions concerning the MMR Vaccine on a Swedish Internet Platform

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Online conversations on the Internet may influence parents' decision-making process regarding vaccination. Therefore, it is essential to understand what parents discuss and how they are advised about vaccinations in online communities. This qualitative study explores online conversations concerning the measles, mumps and rubella (MMR) vaccine among members of a Swedish anti-vaccination community on the social media platform Facebook. We found that negative, erroneous, and pseudoscientific notions of vaccinations were common and often related to broader understandings of child health. Members generally overlooked the beneficial societal aspects of the vaccination. To create trust among parents concerning the MMR vaccine, Swedish healthcare personnel should be given the means and resources to promote the beneficial aspects of the vaccination in relation to parents' risk perceptions as well as to scientifically based arguments and understandings.

Introduction

It is widely accepted by the medical community that vaccines are generally safe and help to save many lives [1]. However, some parents worry about the risks associated with childhood immunizations [2]. Decisions surrounding vaccinations may cause great anxiety. They involve both personal reflections and intense social interest in society [3]. Vaccine confidence is a significant global public health concern. Lower confidence and unimmunized groups could affect herd immunity negatively and result in disease outbreaks [4]. Outbreaks of childhood diseases in high-income countries have been related to parental rejection of vaccinations; thus, it is crucial to understand how parents perceive the risks of childhood immunization, and how they reason and come to a decision concerning immunization for their children [5,6].

Several studies have explored parental decision-making and risk communication of childhood vaccines in different settings [2,7-11]. However, there is a need for research on the reasoning and decision-making process in relation to

the combined vaccine for measles, mumps, and rubella (MMR) in general [12], and particularly in relation to the Internet and to social media platforms [13]. There are only a few studies inquiring into this process, despite the fact that many parents are influenced by vaccine-related information that they acquire online [14]. The Internet is used for spreading anti-vaccination material, dismissing biomedical facts, and favoring unscientific arguments [14-15]. Exploring vaccine-critical websites for as short as only 5-10 minutes can result in increased risk perception of vaccines, and a significant decrease in the willingness to accept vaccinations [16]. Governments need to pay greater attention to how people engage with social media regarding vaccines [17]. Today, many European parents use the Internet and social media for concerns about vaccines, and there are a few other places where people can discuss vaccine anxieties [10]. In order to address these issues, this article gives an insight into parents' perceptions and anxieties regarding the MMR vaccine in a Swedish online community on a Social Media platform.

Generally speaking, online communities with "anti-vaccination" arguments not only reach those opposing vaccines, but they also may influence those seeking more general information about vaccines online [18]. A literature review by the Swedish Institute for Communicable Disease Control (Smittskyddsinstitutet) concluded that social media has given rise to anti-vaccination movements [13]. On the websites representing these movements, biomedical facts may be dismissed in favor of people's own unscientific interpretations and arguments [14-15].

In the United States, it has been shown that parents who declined vaccination for their children were more likely to have searched the Internet for information, compared to parents who accepted vaccination [19]. Moreover, parents may also turn to the Internet after their child has been vaccinated to discuss their concerns [10]. An article wrongly linking the MMR vaccine with autism resulted in a global crisis that still persists today [7,21-23]. This fear still remains as a concern among many parents, even after convincing scientific research proved that no such relationship exists [11,24,25-26].

Apart from fear of autism, there may also be other reasons for parents to doubt the MMR vaccine, such as concerns about general vaccine safety [20], fear of the side effects, or a belief that natural immunity is superior to receiving the vaccine [27]. Parents may also want the child to "mature" before vaccination [28]. In high-income countries, parents with well-functioning vaccination programs typically lack the experience of vaccine preventable diseases, and their fear of vaccine can be stronger than that of the diseases it intends to prevent [29]. Even though parents decide to immunize their children, they may still have doubts about vaccines, and high immunization rates do not necessarily mean that there is a high confidence in vaccines [19]. The introduction of the vaccine in Sweden

contributed to a drastic decline in the reported cases of measles [30]. It is recommended that children be given two doses of the vaccine [31,32]. The MMR vaccination in Sweden is free of charge and voluntary [33].

On the whole, the number of reported measles cases has increased. In 2017, a total of 14,451 cases of measles were reported from 30 countries within the EU/EEA. This was a three-fold increase compared to 2016, mainly due to insufficient vaccine coverage [34]. Forty-one cases of measles were reported in Sweden in 2017 [35]. In 2018, the Swedish MMR vaccination coverage was as high as 97% [36]. Nevertheless, there are those who reject the vaccine [30], and the MMR vaccine is declined more often than all other vaccines [20].

Reasons for refraining from getting the child vaccinated have been related to beliefs that vaccines are dangerous and that the MMR diseases are not severe. Some parents believe that having these diseases as a child is beneficial for the child's health [20]. Other studies in Sweden have shown that parents generally trust the childhood vaccinations but that they may distrust the medical establishment [27]. It has also been shown that parents who believed the MMR vaccine to be unsafe were to a larger extent discontent with the Child Health Center and with the lack of time allocated for questions [28]. Accordingly, both in Sweden and elsewhere, healthcare professionals have an important role in providing comprehensive and satisfying information about vaccinations to parents [2,5,10,20,27,37-38]. Generally, there is a need for more transparent information concerning both the benefits and the downsides of the MMR vaccine [12,20,30].

Parents' decision on whether or not to vaccinate their child is closely associated with risk perception [3], and the notion of risk has always been a component of the vaccine discourse [39]. An objective understanding of risk is often determined by mathematical calculations stating the probability of certain "risky" outcomes. Subjective risk, on the other hand, recognizes people's attitudes and notions, which can differ from the objective risk perception. Accordingly, an objective perspective of risk is insufficient, as it does not consider the ways people understand and assess risk, and ultimately make decisions [40]. In this respect, risk may be defined as "*a situation or event where something of human value (including humans themselves) has been put at stake and where the outcome is uncertain*" [41]. This implies that some kind of value is ascribed to an object at risk [42]. As perceptions of risk are influenced by cultural views, risk can be perceived very differently [43,44].

Methods

In this study, a qualitative, socio-cultural approach was used to get an insight into the process of parental decision-making concerning the MMR vaccine on the Internet. Qualitative studies provide a broad context for risk perception [40], and they are useful when understanding parental vaccine anxieties and de-

cision-making [3]. Data for the study were based on conversations among members of a Swedish vaccination online community on the social media platform Facebook. The online community, where mainly negative aspects of vaccines were discussed, was studied by gathering and analyzing written comments by its members. The community was only accessible to the Facebook community group members and only the members could see the posts and take part in the discussions.

Participation in the Facebook community was possible as the first author received an invitation from another group member and by being approved as a member by the administrators of the community. This particular online community, which has about 4,500 members, was selected as it is one of the largest of its kind in Sweden. It is said to be for anyone who wants to know more about the negative aspects of vaccines, and it is prohibited to "propagate" for the usage of vaccines on the website. Members of the group may post text, pictures, and videos and other members can reply to the posts.

Data gathering took place using word searches for the following words: MPR [the Swedish abbreviation for MMR]; measles; parent; parents; mother; father; childhood vaccinations; child, and were posted between 2016 and mid-2018. This resulted in a data set of 97 posts or 13 single-spaced A4 pages. A criterion for including the written comments from the online community was that the comments had to be related to parents' perspective on the MMR vaccine. The comments were analyzed by qualitative content analysis [45]. We first read all the written comments several times. Categories were created, and themes were formed. The comments were also translated from Swedish into English.

Drawing conclusions from comments in online communities can be problematic as it might be difficult to ensure that people are who they say they are [46], especially concerning the fake accounts flourishing on Facebook [47]. Research focusing on Internet communities also poses some ethical concerns. However, since anyone could apply to be a member of this closed online community, we considered it public domain. The members and their comments could therefore be studied without informed consent [48]. Pseudonyms, or simply "mother," "father," "parent," or "member," were used for the members of the online community.

Results

Among members of the online community, several expressed a strong belief in "natural" bodily processes. They emphasized the body's own protective immune system and were concerned about perceived "unnatural" risks with vaccination. A member declared: "*I think the risk of the side effects of the vaccine is too large, so the potential benefits don't appeal to me. Instead, I chose to build up my immune system*

the natural way." A parent asked for benefits and drawbacks associated with the MMR vaccine, and whether she should vaccinate her daughter or not. Another member replied: "*Absolutely not!! If you want to protect your child and her health, you shouldn't give her any vaccines at all. Instead, you should make sure that her immune system is in good shape with ecological food, avoid milk and sugar and take supplements of vitamin D.*"

Several comments focused on the "self-healing" body. The body's own ability to resist infections and heal as well as a healthy lifestyle with ecological food and body products were contrasted to the artificial and chemical vaccine. Moreover, MMR were seen as normal childhood diseases, and several parents argued that they hoped their children would contract any of the diseases to achieve lifelong immunity. A member wrote: "*Measles is just a childhood disease, it's not Ebola.*" Overall, having confidence in the child's own immune system and the "natural way" was prominent.

In line with these perceptions, the self-healing body was often described as superior in fighting off diseases, in contrast to the "artificial" vaccine that was said to interfere with the immune system, and hence, could pose a greater threat than the MMR diseases: "*The body is amazing. You just have to give it the chance to take care of these diseases by itself and not by poisoning it with chemicals from vaccines.*" In this view, instead of creating healthy bodies, vaccines contributed to disease and ill health. A member wrote: "*A healthy and unvaccinated child can defeat diseases in a harmonized, balanced way. A vaccinated child with traces of heavy metals in the body would risk getting severely ill because these diseases love heavy metals and use them as their fuel.*"

The idea that the "natural" unvaccinated child is healthier than a vaccinated child, who has been exposed to "unnatural" and "poisonous" substances, was common. This was also evident in the following comment where a parent asked whether she should vaccinate her child or not with the MMR vaccine: "*The measles vaccine is one of the most dangerous vaccines there are. It's risky to vaccinate a child who might have the natural disease. Then, she will also get the artificial disease plus all the chemicals, this can give an increased risk of complications.*" Parents frequently expressed concerns over the possible dangerous ingredients of the vaccines: One member wrote: "*It's a triple vaccine and they are dangerous, especially in early ages.*" Another member simply replied "*Autism*" while another wrote: "*The risk with the vaccine is much greater [than the diseases]. The MMR vaccine gives the most dangerous side effects and children are dying each day because of the vaccine.*"

A generally held belief was that giving a child the vaccine was not only ineffective but also more dangerous than contracting any of the diseases. A general lack of trust toward the medical establishment, biomedicine, and vaccines was also common in relation to discussions about the unsafe and ineffective MMR vaccine. A member posted a picture of a mermaid, a unicorn, the character Bigfoot, a leprechaun, and an alien sitting in a circle. The mermaid pointed to

a chair and said: "*I would like to introduce you to our newest member… the oh so mythical safe and effective vaccine*."

Members of the online community also gave advice on what arguments to use when talking to someone with pro-vaccination beliefs. They also shared arguments about how to refuse vaccines and to promote anti-vaccination decision-making. In some cases, parents wanted to "confirm" that they made the right decision to refrain from vaccinating their child. A father wrote: "*I have a son who is supposed to get vaccinated next week. I feel very skeptical about this because his health hasn't been very well, but I feel that I have too little knowledge to make a discussion*." A member replied: "*According to a lot of people, the MMR vaccine is the worst [vaccine] with many side effects and the diseases they say it prevents are harmless. There is really no reason to give such a vaccine to a child*."

Parents also asked for advice on how to explain their decision to refrain from vaccination, and the online community often worked as a way to connect parents with similar viewpoints. In these discussions, the risks with the diseases were commonly downplayed, while perceived risks with the vaccine were highlighted. Other comments showed a desire to "help" parents not to vaccinate their children: "*How can I explain to these parents that there are different ways to think about vaccines without interfering too much with how they take care of their baby? I just want to be a good friend and enlighten them*." A member replied: "*Tell them the horror stories. That's how I started to read about these things. I got so scared. Skip the talk about ingredients. Maybe it's a bit mean, but it should work*."

In a similar vein, a mother asked the group for advice as she was in a discussion with the father of her child about the MMR vaccine. She was of the opinion that it should not be given to the child, while the father tried to make her change her mind. A member replied: "*He has no right to vaccinate without your approval. He is brainwashed by the authorities*." Another member added: "*Stay strong! Don't let this get to your head! Both parents have to agree; otherwise, they can't vaccinate your child*."

Members frequently raised issues concerning conversations with healthcare personnel. A member complained: "*The doctors are so much on to us. They use every possible chance to push for the vaccine*." Many parents stated that they were unsure or skeptical of the doctors or nurses' recommendations to vaccinate. They were usually advised by other members to avoid vaccination and told that the vaccine was bad. On other occasions, parents asked for "good arguments" to "stand up against healthcare professionals" and to refuse vaccines.

The online community often functioned as a way to strengthen ones and others' beliefs against vaccinations as well as to stay "united" against the healthcare personnel and the biomedical community. This theme of "us" versus "them" was present in many comments also in relation to family members and friends who had a divergent opinion. "Us" became the members of the online com-

munity who were worried and skeptical of vaccines and those who completely rejected vaccines. "Them" included parents who were positive to vaccines, healthcare professionals, the biomedical establishment, media that was said to spread and propagate for vaccines, pharmaceutical companies, the "establishment," and even society as a whole. They were commonly depicted as "brainwashed" or untrustworthy.

Sometimes, the posts indicated severe suspicion and mistrust toward healthcare professionals and biomedicine in general. In this post, written by a father using a warlike language, healthcare professionals were said to scare people to enforce them to vaccinate their children: "*Fear is their best weapon. Our knowledge of risks and diseases is our best weapon. The more informed you are, the easier it is to see through their arguments*." He continued: "*My son became autistic after the MMR vaccine at five years of age, so I know*."

In a similar vein, economic issues concerning vaccines were present in many discussions, especially in relation to suspicion and mistrust toward the Swedish national vaccination program and the pharmaceutical industry. A mother wrote: "*Childhood diseases are expensive for society, but they are not dangerous. This is why they started to vaccinate against them in the first place*." Economic profit was, in this perspective, more important than children's health and well-being. Similarly, discussing the pharmaceutical companies and "big business," another member wrote: "*What are these companies' goal? To generate profit for their shareholders. Does that mean these giant medical companies want people to be healthy or sick?*" He continued: "*If everyone is healthy, they won't make any money, so of course they want people to be sick. However strange this may sound, we can't pretend it's in any other way. So, the companies producing vaccines have a basic interest in that people are sick so that they can sell their medicines*."

Discussion

The members of the online community generally doubted the safety and efficacy of the MMR vaccine. They posed it as a threat to children's health, while also mistrusting the medical companies and healthcare professionals distributing the vaccine. Moreover, MMR were often perceived as as normal childhood diseases and there were a strong belief in the body's own immune system to handle them. In some of the posts, children's health was opposed to earning money and "big business," and the medical industry's agenda was to keep people sick in order to continue selling pharmaceuticals. In these online conversations, public health perspectives and arguments were more or less absent. There were almost no comments on how vaccines may prevent diseases from spreading, or how vaccines may protect children with an impaired immune system. The members of the online community frequently overlooked the beneficial aspects of vaccinations, both for society and the public; instead, they prioritized their own

children's health, in what has been described as an individualistic neo-liberal parenting style [49].

The posts and discussions within the Internet community indicate that the reasoning concerning vaccines is complex, involving socio-cultural informed understandings of child health, the body, relations with family and friends, interactions with healthcare personnel, as well as political-economical aspects and perspectives. Concerns about vaccines have been linked to both a breakdown of trust and erroneous notions of risk [3]. However, vaccine skepticism and subjective perceptions of risk associated with the MMR vaccine must be understood in a relational context, weighing in the different ways that parents perceive children's health. How parents perceive the vaccine, the severity of the diseases, as well as how they understand the role of the medical community and public health efforts will affect their decisions to vaccinate or not [3,40,42]. The negative responses that anxious parents received when asking other members in the online community if they should vaccinate their child or not indicate a profound lack of trust and confidence toward the healthcare sector. This is consistent with other research showing that parents may mistrust healthcare providers, the medical establishment, and the government, while favoring the media and non-official sources of information [5,7-11].

Today, when many turn to the Internet for guidance, it is becoming increasingly important to understand parents' subjective perceptions of risk and how they view, discuss, and are advised about childhood vaccinations on anti-vaccination websites and in online groups. Healthcare personnel should be given the means and resources to promote scientifically-based arguments and understandings of the MMR vaccination in order to influence the decision-making process regarding the MMR vaccine, challenge misinformation on the Internet, and create trust and confidence among parents who are about to vaccinate their children [21]. This should imply ways to improve communication, pay attention to how parents perceive risk, and prepare them to be aware of the misinformation on pseudoscientific websites and within anti-vaccination communities on social media platforms. In so doing, they should focus on both the positive and negative aspects of vaccinations [12,20,30], preferably through both individual and group counseling.

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