**Title:** Factors contributing to parental ‘vaccine hesitancy’ for childhood immunisations.

**Authors:** Valerie Haroune and Liz King

**Abstract**

Childhood immunisations have contributed to saving millions of lives worldwide. However, a growing number of parents decline immunisations while others choose to delay them. Other parents opt for selective immunisations. These behaviours contribute to the reduction of herd immunity and to the possible resurgence of certain diseases. This extended literature review identifies factors that contribute to this ‘vaccine hesitancy’ amongst parents. Seven qualitative studies were selected and examined using thematic analysis. The main themes identified are ‘safety’, ‘effectiveness’ and ‘healthcare factors’ which suggest that vaccine hesitancy is more intricate than parents simply agreeing or disagreeing to treatment. A spectrum of behaviours contribute to vaccine hesitancy and decisions are highly influenced by the parents’ perceived need to researchimmunisations information online. Healthcare professionals involved with childhood immunisations need to be aware of these factors and behaviours that attribute to vaccine hesitancy for their professional practice.

**Introduction**

Vaccine hesitancy has been listed amongst the World Health Organization’s (WHO) (2019a) ‘top ten threats to global health in 2019’. It is defined as ‘the reluctance or refusal to vaccinate despite the availability of vaccines’ (WHO 2019a). Vaccine hesitancy is a complicated concept which encompasses a wide spectrum of behaviours and opinions. A regular topic in the media, vaccine hesitancy has been named as the reason for the global reduction in herd immunity i.e. when a sufficient portion of a population is immune to a specific disease, mainly through immunisation, thereby protecting individuals who have not developed immunity (WHO 2019a). Consequently, the resurgence of vaccine-preventable diseases, such as measles and pertussis, are posing a risk to public health. This extended literature review (ELR) aims to investigate factors that contribute to this vaccine hesitancy for childhood immunisations amongst parents.

**Methods**

An ELR, defined as a critical analysis of primary empirical research (Cronin *et al* 2008; Aveyard 2011), was conducted to answer the research question- ‘what factors contribute to vaccine hesitancy amongst parents?’. The research question was formulated using the PEO (Population and their problems, Exposure, and Outcomes or themes) framework; keywords were developed by formulating a facet analysis (see table 1). Boolean operators such as ‘AND’, ‘OR’ and ‘NOT’ were used to connect or separate keywords. Truncation symbols such as the asterisk (\*) and dollar symbol ($) were used as an additional broadening search technique (Bettany-Saltikov 2012). This provided the basis for the subsequent literature searches.

Inclusion and exclusion criteria were utilised in order to produce effective searches with a focus on the research question (Williamson and Whittaker 2017) (see table 2). A publication date range of 2014-2019 was utilised to ensure the use of contemporary research which captured the most recent changes in attitude towards childhood immunisations. Additionally, it was decided that quantitative papers would be excluded as study participants’ views and opinions were more likely to be captured via papers following a qualitative research paradigm. The ELR literature searches were conducted using databases such as British Nursing Index (BNI), Ovid Emcare and The Cumulative Index to Nursing and Allied Health Literature (CINAHL). Due to the success in retrieving relevant papers via these databases other search strategies including back chaining/snowballing were not required.

**Findings**

Seven relevant papers were selected from various developed countries who currently offer immunisations to children (Table 3). The authors of these papers utilised qualitative data collection tools that aimed to capture parents’ reasons for any vaccine hesitancy. All the chosen papers gained ethical approval including valid consent processes for study participants.

Caldwell’s framework for critiquing healthcare research (Caldwell *et al* 2005) was applied in order to further demonstrate the robustness of the seven chosen papers. This framework was identified as beneficial in uncovering recurring patterns, or common themes, which could be developed and discussed. This choice of framework was based upon its ease of use and known success of critiquing qualitative research papers.

Three main themes were identified via the critiquing process. *Safety*was the common denominator in all seven papers reporting concerns over vaccine safety, more specifically over ingredients and side-effects, including the risk of developing autism. The second theme was the *effectiveness*of vaccines, noted by McNeil *et al* (2019), Dubé *et al* (2016), Costa-Pinto *et al* (2017) and Ward *et al* (2017). Some of the parents argued that certain diseases had been eradicated thus removing the need for these specific immunisations. *Healthcare factors*constituted the final theme, highlighted by McNeil *et al.* (2019), McHale *et al* (2015), Dubé *et al* (2016), Chow *et al* (2017), Ward *et al* (2017) and Costa-Pinto *et al* (2017). These factors included distrust in pharmaceutical companies and healthcare professionals and delayed immunisations due to the inability to book an appointment or when a child suffered from an illness.

Safety

The strongest argument in favour of vaccine hesitancy, present in all seven papers, was parental concern regarding vaccine ingredients. Toxicity and side-effects were shown to outweigh parental acknowledgement of the health benefits of immunisations. Parental concerns also included safety issues over the number of injections associated with the immunisations.

These concerns are highlighted in Chow et *al*’s (2017) Australian study in which, 52% of parents reported concerns over vaccine safety, 21% over autism and 22% over weakening the immune system. By contrast, out of 1,560 pregnant Canadian women taking part in McNeil *et al*’s study (2019), only 9% of women expressed concerns over safety, including autism. Findings in Costa-Pinto *et al’s* study (2017) showed similar findings. Indeed, 43% of respondents disclosed concerns over safety; 18% of respondents were concerned about allergies, 17% worried about weakening the immune system, 11% about autism and 22% of parents reported concerns specific to vaccine ingredients.

While six out of the seven papers focused on childhood immunisations, McHale *et al* (2015) primarily addressed parental views on the MMR vaccine post-measles only. The results nonetheless support concerns reported in the other papers. In this study, out of a sample of 47 parents, 50% expressed concerns over autism as a contributing factor for declining the MMR vaccine. It is important to note that post-measles, 43% of these same parents decided to give their child the MMR vaccine in spite of these concerns.

Effectiveness

Concerns about ineffectiveness of vaccines were reported in four out of the seven papers. Both Costa-Pinto *et al* (2017) and McNeil *et al* (2019) share similar findings regarding concerns about vaccine effectiveness regarding whether immunisations are required for diseases which are now rarely seen. Although the majority of parents in the Costa-Pinto *et al*’s study (2017) agreed that vaccines play an important role in the reduction of the incidence of diseases, 179 respondents felt that these diseases have now become uncommon. This view is also reported in McNeil *et al*’s study (2019), which suggests a similar trend in parents’ views. Comparable findings are reported by Dubé *et al* (2016). In this study, some mothers reported firmly believing in the current eradication of these illnesses hence declaring immunisations unnecessary. The mothers’ perceived view that diseases are no longer a threat is described as a contributing factor to vaccine hesitancy. As a result, it was some parents’ belief that the improbability of contracting these diseases renders immunisations unnecessary.

Another significant aspect of ‘ineffectiveness’ was the desire to fight off diseases with the help of natural immunity. Many of the parents in the chosen papers reported the wish to develop natural immunity through contraction of diseases instead of immunisations. Natural immunity was perceived as stronger than vaccine immunity, which is described by the parents in Dubé *et al’*s study (2016) as ‘unnatural’. In addition, concerns were raised as to the duration of protection of immunisations. The preference for natural immunity made nine mothers decline all immunisations (Dubé *et al* 2016). In the same way, natural immunity is listed as a preference over immunisations in Ward *et al*’s study (2017) with the benefits of breastfeeding in order to develop natural immunity being discussed by several women. Some of their children were breastfed for over two years in order to reduce the need for immunisations.

Healthcare factors

Distrust in healthcare professionals and pharmaceutical companies was reported in four out of the seven papers as factors contributing to vaccine hesitancy (McHale *et al* 2015; Dubé *et al* 2016; Ward *et al* 2017; McNeil *et al* 2019). Parents reported forming this opinion mainly via their negative interactions with healthcare professionals. This opinion was also formed by the parents’ perception that vaccine information available, either online or via paper documentation, was conflicting or lacking comprehensive information.

Vaccine hesitant mothers showed a greater level of distrust when it came to healthcare professionals. Parents in Ward *et al*’s study (2017) cite reports of patronising General Practitioners (GPs) contributing to feelings of distrust in this healthcare professional. Some mothers believed GPs worked alongside pharmaceutical companies to influence parents’ decisions. A further belief in a collusion between the government and pharmaceutical companies was also reported. In addition, some mothers also reported concerns over pharmaceutical companies influencing medical research. Each mother who reported these beliefs in Dubé *et al*’s study (2016) had more than one child, none of whom were immunised, bar one who was partially immunised.

Instead of trusting their GP, some of these parents opted for complementary and alternative medicine, which was believed to be more effective and less harmful (McHale *et al* 2015; Dubé *et al* 2016). In addition, distrust in healthcare professionals resulted in some parents accessing online information from various websites. For example, parents in Ward *et al’s* study (2017) cited a need for conducting ‘your own research’ before trusting a healthcare professional ‘blindly’. Additionally, these parents reported discussing different options with complementary and alternative professionals in lieu of immunisations. One mother reported her chiropractor’s opinions as being more trustworthy than her GP’s as they have ‘nothing to gain’ either way (Dubé *et al* 2016).

Barriers to successfully booking a medical appointment was also cited as a contributing factor to vaccine hesitancy. Parents reported being too busy at work to book an appointment (McHale *et al* 2015; Dubé *et al* 2016; McNeil *et al* 2019). Parents also identified busy GP surgeries rendering booking an appointment challenging. Similar findings were reported by McNeil *et al* (2019) with parents citing not being able to take time off work in order to attend appointments.

Parents in Wang *et al*’s study (2015) cited child illness as a reason for delaying immunisations. In McHale *et al’*s study *(*2015), 11 out of 47 parents cited child illness as the reason for not booking a medical appointment for their child to receive the MMR vaccine. Subsequently, 21% of the 47 children became infected with measles and were then hospitalised. Other parents chose not to immunise their child until they became older and put on weight (Dubé *et al* 2016; McNeil *et al* 2019). Additionally, one mother delayed immunisations because she forgot to book an appointment (Dubé *et al* 2016).

**Discussion**

Safety concerns were clearly a factor for vaccine hesitancy for parents in all the chosen papers especially with the MMR vaccine having a high level of controversy despite Wakefield *et al*’s (1998) discredited study (Deer 2011). This autism link was specifically named as the main concern in five out of the seven papers selected for this ELR. This led to many parents accessing private clinics to provide individual immunisations to avoid injecting their child with this combined MMR immunisation. These parents complied with immunisations but on their own schedule. Although WHO (2017) acknowledges side-effects linked to immunisations including anaphylaxis and death, the likelihood of such events has been reported to be 1.31 per million (McNeil *et al* 2019).

The chosen papers highlighted the difference between elimination and eradication of an infection, seemingly to have mislead many parents into believing in the abolition of certain diseases, leading to parents not immunising their children against these diseases. Consequently, low immunisation uptake increases the likelihood of the resurgence of infections putting children too young to be immunised and the immunosuppressed at risk (Dowdle 1998). A recent example is the UK losing its measles free status of 2017 due to decreased uptake of the associated MMR immunisation (Public Health Matters 2019).Additionally, WHO (2019b) report a 300% increase in measles cases around the globe in the first trimester of 2019.

Another factor influencing vaccine hesitancy is child illness. Parents in the chosen papers reported having to delay immunisations because their child was ill. The nature of the illnesses was not disclosed. This does however raise questions as to whether parents decided not to book or cancel appointments based on their owndecisionor based on a conversation with a healthcare professional. Furthermore, parents also reported the inability to book a medical appointment due to work commitments or a lack of available appointments. This contributed to both delays and non-immunisation. This issue was not isolated to one paper and was a recurring report in three of the chosen papers (McHale *et al* 2015; Costa-Pinto *et al* 2017; McNeil *et al* 2019).

Significantly, all findings from this ELR, except for not being able to book a medical appointment, are based on one commonality; parents’ own online *research*. Easy access to online information was shown to influence parents’ decision-making. Parents in the chosen papers reported little difference between researching car seats or cots online and researching immunisations. Immunisations are treated in a similar manner to provide ‘the best’ for their child. This process could be explained in the chosen papers as a natural reaction in a time when technology is within everyone’s reach. It could be argued that advances in technology are contributing to the misinterpretation of information. It could also be argued that people’s trust in medical professionals was higher before the invention of the internet. The parents in the chosen papers felt that the wealth of online information was helping them make the right decision for their child. None of the parents in the chosen papers considered their actions to be detrimental to other children. This issue does not appear to have a simple solution. It is impossible to stop online misinformation as it is impossible to stop parents from searching the internet which has connotations for healthcare professionals.

**Implications for Practice**

Based on the findings of this ELR, all the chosen papers suggest that communication between healthcare professionals and parents is key to, not only providing accurate information about immunisations, but also to ascertain the reasons why parents have vaccine hesitancy (Dubé *et al* 2016; Chow *et al* 2017; Costa-Pinot *et al* 2017; McNeil *et al* 2019). The use of motivational interview techniques has been suggested in the chosen papers as a method of informing parental decisions about immunisations as well as the provision of parent-friendly literature that can incorporate stories and pictures (McHale *et al* 2015; Dubé *et al* 2016; Chow *et al* 2017; Costa-Pinto *et al* 2017; Ward *et al* 2017; McNeil *et al* 2019). This includes the use of online resources which may be particularly useful for those parents who prefer information presented via the internet (Chow *et al* 2017). These techniques reflect the existing ‘Making Every Contact Count’ guidance from Public Health England (2016) which could be useful to all healthcare professionals who are involved with caring for children.

A review of healthcare services is described in all the chosen papers as essential to increasing the availability and access of appointments for the delivery of immunisations. This includes the opportunity to see a healthcare professional outside of parents’ normal working hours (McHale *et al* 2015; Dubé *et al* 2016).

Wang *et al* (2015), Dubé *et al* (2016) and Costa-Pinto *et al* (2017) suggest that further research is required to understand vaccine hesitancy in general aiming to address the reasons that contribute to this parental decision.

**Conclusion**

Emerging findings from this ELR relate to parental concerns over the ‘safety’, ‘effectiveness’ and ‘healthcare factors’ relating to childhood immunisations. Implications for practice include improved communication and informational aids for parents plus a change in the availability of medical appointments. It is evident that further research is required into vaccine hesitancy to inform healthcare practice and help to improve uptake of childhood immunisations.

Parental vaccine hesitancy has become a regular topic in the media and has consequently contributed to the resurgence of certain diseases. The findings of this ELR suggest that the factors contributing to parental vaccine hesitancy are complex. Healthcare professionals need to be aware of the associated available research to be able to provide safe and effective care and help protect the public.

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