How do practice nurses influence the uptake of the measles, mumps and rubella vaccine?

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Abstract

Background

Immunisation is the most significant intervention to influence global health, and is a proven tool for controlling and eliminating life threatening infectious diseases. Parental immunisation decision-making is influenced by many factors: location and access to services; relationships with health professionals; sources of information; social class; ethnicity; and other health care issues.

Practice nurses have substantial contact with parents of young children requiring vaccination, and are a key group of health professionals involved in the UK national immunisation programme. Despite this, there is a lack of understanding pertaining to how practice nurses can influence parents' immunisation decision-making concerning the MMR vaccine. This study is designed to fill that gap.

Aims

The three aims of this study were to:

1) conduct an integrative review to ascertain the beliefs and perceptions of practice nurses' influence about the uptake of the MMR vaccine;

2) explore the perceptions of practice nurses concerning their role and strategies used to promote MMR vaccine uptake;

3) explore how practice nurses engaged with parents during their consultations about the MMR vaccine.

Design

The design of this three phase study consisted of an integrative review (Phase 1) and two exploratory descriptive qualitative designs (Phases 2 and 3).

Method

In Phase 1, data were analysed using integrative review processes. Convergent qualitative synthesis was used to draw the data together. During Phases 2 and 3, thirty practice nurses (principally practising in London) took part in semi-structured

interviews that were audio recorded and transcribed verbatim. Qualitative content analysis was used to systematically manage, analyse, and identify themes.

Findings

Phase 1 findings identified four themes: parental immunisation influencing factors, practice nurse characteristics, information and communication, and personal views and concerns. The integrative review provided an excellent baseline to ascertain the beliefs and perceptions of practice nurses' influence on the uptake of the MMR vaccine. However, the majority of the 12 articles were at least 10 years old and may not have reflected current practice nurses' views and perceptions. This led to the need for further research as identified in the Phase 2 and 3 studies.

The findings of the Phase 2 study provided an understanding of how practice nurses perceived the most important aspects of their role in immunisation, and the strategies they implemented to promote the MMR vaccine. These strategies were wide ranging to include the provision of contemporary immunisation information to parents, and to dispel myths and misconceptions concerning the MMR vaccine. Practice nurses sought to explore parental health beliefs, endeavoured to understand the parents' perspective, and alerted parents to local outbreaks of measles. By effecting these strategies, practice nurses sought to inform parents and assist their MMR immunisation decision-making.

Practice nurses in the Phase 3 study explored how they engaged with parents during their MMR consultations. They sought to provide parents with tailored sources of information to supplement their immunisation decision-making. Practice nurses described the need for a robust evidence base concerning the MMR vaccine, which they believed enabled them to address parental questions relating to vaccine content and side effects. Furthermore, practice nurses reassured parents who had safety concerns about the MMR vaccine, in so doing promoting this vaccine.

Conclusion

The key findings in this study illustrate the ways in which practice nurses engage with parents to promote the uptake of the MMR vaccine. This demonstrates the leading

role that practice nurses play in advocating for and promoting the uptake of the MMR vaccine.

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List of Abbreviations

AAGPNE – Association of Academic General Practice Nurse Educators

APN – Advanced Practice Nurse

BAME – Black, Asian, Minority Ethnic

CDC – Centre for Disease Control and Prevention

CPD – Continuing Professional Development

CNS – Clinical Nurse Specialist

DPT – Diphtheria, Pertussis and Tetanus

FI – Financial Incentives

GP – General Practitioner

Hib/MenC – Haemophilus influenza type b and meningitis C

HV – Health Visitor

IMD – Index of Multiple Deprivation

MeSH – Medical Subject Headings

MenB – Meningococcal B

MMR - Measles, mumps and rubella

New GMS – new General Medical Services

NICE – National Institute for Health and Care Excellence

NMC – Nursing & Midwifery Council

NP – Nurse Practitioner

NRES – National Research Ethics Service

PCTs – Primary Care Trusts

PHN – Public Health Nurse

PN – Practice Nurse

PCV - Pneumococcal Conjugate Vaccine

QMS - Quasi-Mandatory Schemes

SAGE – Strategic Advisory Group of Experts on immunisation

SARS-CoV-2 – Severe acute respiratory syndrome coronavirus 2

UNICEF – United National International Children's Emergency Fund

USA – United States of America

VENICE – Vaccine European New Integrated Collaboration Effort

VHS – Vaccine hesitancy scale

WHO – World Health Organization

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THE FOLLOWING PARTS OF THIS THESIS HAVE BEEN REDACTED FOR COPYRIGHT REASONS:

Review Article (in chapter 2): What are the beliefs and perceptions of practice nurses' influence about the uptake of the measles, mumps, and rubella vaccine?: An integrative literature review. pp.26-65

Article (in chapter 4): Practice nurses' perceptions of their immunization role and strategies used to promote measles, mumps, and rubella vaccine uptake in 2014 – 2018: A qualitative study. pp.102-120

Chapter 1 – Introduction

1.1 Background

The preventable diseases of measles, mumps and rubella can lead to illness, disability and death (Demicheli et al., 2013). These diseases have been recognised in some instances for centuries. The first written description of mumps as a disease can be found as far back as the fifth century BC when Hippocrates described an outbreak of mumps on the Greek island of Thasos (Tsoucalas et al., 2013). Measles was documented in the ninth century AD by a Persian doctor who published one of the first written accounts of this disease (Centres for Disease Control and Prevention, 2018). More recently, rubella was described in the mid-eighteenth century when Friedrich Hoffman provided the first clinical description of this disease in 1740 (Ackerknecht, 1982).

The introduction of the measles, mumps and rubella (MMR) vaccine in 1988 led to changes in the incidence of these diseases (Salisbury et al., 2006). However, in the late 1990s and early 2000s national vaccine coverage at two years of age dropped to below 80% for one dose of MMR due to widespread concern around the discredited link between the vaccine and autism (Salisbury et al., 2006). The discredited link was driven by the Wakefield et al paper published in 1998, which caused parental concern about the safety of the MMR (Wakefield et al., 1998). An increase in the confirmed cases of measles and mumps in particular followed this period and cases have continued to rise in England and Wales. Based on notifications made to Public Health England, measles notifications rose from 56 in 1998 to 810 cases in 2019. Similarly, 121 cases of mumps were notified in 1998, increasing to 5558 in 2019 (Public Health England, 2020a). A significant concern related to the increasing incidence of measles is the subsequent increase in serious complications associated with this disease, such as encephalitis and subacute sclerosing pan-encephalitis (Salisbury et al., 2006).

1.2 Immunisation

Immunisation is considered the most significant intervention to influence global health in modern times and is a proven tool for controlling and eliminating life threatening infectious diseases (World Health Organization, 2020). Immunisation is the process whereby an individual becomes immune to an infectious disease, typically by the administration of a vaccine (World Health Organization, 2020). Vaccines stimulate the body's own immune system to protect an individual against subsequent infection or disease (World Health Organization, 2020). National immunisation programmes have resulted in a steady decline in child morbidity and mortality (Haider, et al., 2019). It is estimated that every year immunisation prevents between two and three million deaths globally (World Health Organization, 2020). The majority of countries in the developed world, such the United Kingdom (UK) recommend the same vaccines for infants, children and adults (University of Oxford, 2017).

1.2.1 The national immunisation programme

The UK has a structured national immunisation programme, which continues to evolve (Department of Health, 2020a; Department of Health, 2020b). The overall aim of the national immunisation programme is to protect individuals against the following preventable diseases: diphtheria, haemophilus influenza type b, hepatitis B, herpes zoster, human papillomavirus (certain serotypes), influenza, measles, meningococcal disease (certain serogroups), mumps, pertussis, pneumococcal disease (certain serotypes), polio, rotavirus, rubella and tetanus (Department of Health, 2020b). Many of the vaccines in the national immunisation programme are combined vaccines such as the (MMR) vaccine, which is recommended to be administered at 12 months of age and again at approximately 4 years of age (Department of Health, 2020b).

The scheduling of the MMR vaccine at 12 months of age is considered the optimal time for commencing this vaccine (Nicoara et al., 1999). This is due to the decay of maternally derived antibodies to measles, mumps and rubella viruses, which would otherwise affect the immune response of the vaccine if the MMR vaccine was given earlier than 12 months of age (Nicoara et al., 1999). The schedule of the national

immunisation programme has been designed to provide active immunity against infections. Active immunity is protection that is produced by an individual's own immune system and is usually long lasting (Department of Health, 2020b). Such immunity generally involves cellular responses, serum antibodies or a combination of both acting against one or more antigens on the infecting organism (Department of Health, 2020b). In order to confer immunity to a significant portion of a population (referred to as herd immunity), the World Health Organization (WHO) recommends that 95% of vaccine eligible people are immunised against vaccine preventable diseases (Haider et al., 2019). The success of any national immunisation programme is dependent on meeting herd immunity levels to prevent local outbreaks and epidemics of the diseases it is targeting against, such as measles, mumps and rubella (Department of Health, 2020b). The MMR vaccine protects against these aforementioned diseases by conferring immunity (Hakim et al., 2019).

1.2.2 The MMR vaccine

In 1968, prior to the availability of the MMR vaccine in 1988, a single monovalent measles vaccine was introduced into the UK national immunisation programme (Salisbury et al., 2006). However, following the introduction of this vaccine there continued to be between 50,000 and 100,000 measles notifications annually (Salisbury et al., 2006). A single dose of the trivalent MMR vaccine was introduced in October 1988 to replace the monovalent measles vaccine (Jansen et al., 2003; Salisbury et al., 2006). A two dose MMR schedule was subsequently added to the UK national immunisation programme in 1996 (Redsell et al., 2009). The purpose of which was to achieve more effective immunity in vaccinated individuals and reach herd immunity levels of at least 95%. Measles and similarly mumps and rubella are highly contagious diseases and require vaccination levels to be at least 95% to maintain herd immunity and prevent outbreaks (Cockman et al., 2011).

Despite the importance of achieving herd immunity levels for the MMR vaccine, a publication in *The Lancet* in February 1998 questioned the safety of the MMR, particularly in relation to a perceived association of this vaccine with Autism and

Crohn's disease (Wakefield et al., 1998). This study consisted of 12 children ranging in age from three to 10 years of age who were admitted to the Royal Free Hospital, London, UK for a series of gastroenterological, neurological and development assessments. While eight of the parents reported behavioural problems after their children received the MMR vaccine, the authors concluded that there was no proven association between the MMR vaccine and the syndrome (i.e. gastrointestinal disease and development regression) described (Wakefield et al., 1998). Despite this, the publicity generated by this paper led to scepticism amongst parents about the safety of the MMR vaccine with a resultant decrease in the uptake of MMR vaccination in England (Hilton et al., 2007). While herd immunity levels for the first dose of MMR vaccine in England reached 92% in 1992, and stayed above 90% until 1998, this level fell to 79% by 2003 (Cockman et al., 2011). The reduction of herd immunity levels for MMR continued despite a retraction by the majority of the original researchers that wrote the Wakefield et al research refuting an association between the MMR vaccine and the syndrome described (i.e. gastrointestinal disease and development regression) (Murch, 2004). The decline in the uptake of MMR was despite extensive evidence to support the safety and effectiveness of this vaccine (Dales et al., 2001; Farrington et al., 2001; Honda et al., 2005; Kaye et al., 2001; Madsen et al., 2002; Madsen & Vestergaard, 2004; Taylor et al., 1999; Taylor et al., 2002).

Adverse reactions following the MMR vaccine have been reported and are due to effective replication of the vaccine viruses with subsequent mild illness (Salisbury et al., 2006). Following the first dose of MMR vaccine, malaise, fever and/or a rash can occur, most commonly about a week after immunisation, and last about two to three days. Additional parotid swelling can occur in about 1% of children of all ages up to four years, usually in the third week following receipt of the MMR vaccine (Salisbury et al., 2006). Rarer adverse reactions that have been reported are febrile seizures. However, the rate of febrile seizures following MMR is lower than that following infection with measles disease (Plotkin & Plotkin, 2004). As the MMR vaccine is a live, attenuated vaccine, it is biologically plausible that it may cause encephalitis (Salisbury et al., 2006). However, results from a large retrospective study in Finland, looking at

over half a million children aged between one and seven years, did not identify any association between MMR and encephalitis (Makela et al., 2002).

1.2.3 Recent trends in measles, mumps and rubella

The incidence of measles and mumps in particular has continued to increase in Europe. During January 2016 and October 2017 alone, a total of 9 000 cases of measles were reported in the European Union, resulting in 44 deaths (Coombs, 2017). The highest cases of measles have been reported in Italy with over 4,400 cases from January to August 2017 (Filia et al., 2017) with measles cases re-emerging in Portugal between February and May 2017 following 12 years without endemic transmission (George et al., 2017). Data from Europe revealed 82,596 people contracted measles in 2018 (Thornton, 2019). The majority of measles cases in 2018, unlike 2017 were linked to two countries namely Ukraine (n = 53,218) and France (n = 2,913) (Gallup, 2019). England and Wales has seen an increasing incidence in measles from 283 cases in 2017 rising to 810 cases in 2019 (Public Health England, 2020a). Similarly, mumps cases in England and Wales significantly increased from 1840 cases in 2017 to 5558 cases in 2019. However, while cases of measles and mumps increased, cases of rubella remained static from 2017 to 2019 inclusive with three cases per annum reported (Public Health England, 2020a).

1.3 Factors influencing parental immunisation decision-making

There are many factors cited in the literature that influence parental immunisation decision-making, such as: location and access to services; relationships with health professionals; sources of information; social class; ethnicity and other health care issues.

1.3.1 Location and access to services

The ease of accessing health services has been identified as a factor influencing parental immunisation decision-making. Access to, and convenience of, immunisation services were factors identified in Hackney, London, as impeding vaccine uptake, which is home to the largest Charedi Orthodox Jewish community in the UK (Letley et

al., 2018). Findings from an integrative review examining factors affecting access to immunisation revealed that barriers to accessing these services included a lack of transport and, location or distance from immunisation services (Wyllie et al., 2019). Similarly, a systematic review of factors influencing parental immunisation decision-making revealed the distance to access immunisation services impeded uptake (Forster et al, 2016). A survey of general practices in Cumbria and Lancashire, England examined practice demographic, structural and immunisation process factors in an attempt to identify characteristics of general practices achieving the Department of Health MMR target of 90% coverage (Lamden & Gemmell, 2008). The results showed that the uptake of MMR was strongly correlated with the Index of Multiple Deprivation (IMD) of barriers to housing and services (Lamden & Gemmell, 2008). The IMD provides a set of relative measures of deprivation for small areas across England, based on seven different domains of deprivation of which barriers to housing and services is one such measure (Department for & Communities and Local Government, 2015).

1.3.2 Relationships with health professionals

Key health professionals involved in the promotion and administration of the national immunisation programme in the UK include general practitioners, health visitors and practice nurses. There is evidence to suggest that general practitioners and health visitors can influence parents' decision-making regarding whether to immunise their children with the MMR vaccine, although this level of influence is not always consistent (Casiday et al., 2006; Evans et al., 2001; Harrington et al., 2000; McMurray et al., 2004; Mixer et al., 2007; Petrovic et al.,. 2001; Smailbegovic et al., 2003). For instance, parents or guardians of children aged between two and a half and three years reported that they were not likely to be influenced by a health visitor (Walsh et al., 2015). Furthermore, interviews of eight general practitioners revealed that the majority found that many parents had already decided to immunise their child with the MMR vaccine. This led these general practitioners to suggest that their involvement in parental immunisation decision-making was minimal (Poltorak et al., 2005). Interviews of

mothers in two health centres in Dublin, Ireland revealed their preference for childhood immunisations at their general practice rather than at health centres (Harrington et al., 2000). The mothers perceived their general practitioners more likely to engage with their child compared to health professionals at health centres (Harrington et al*.,* 2000). A mixed methods study in Scotland sought to explore the views of parents of incompletely immunised children compared with parents of completely immunised children (Macdonald et al., 2004). Parents of completely immunised children reported they were more likely to discuss queries about immunisation information sources with general practitioners and heath visitors in particular than parents of incompletely immunised children (Macdonald et al., 2004).

It has been suggested that the degree of health professional influence can be determined by the knowledge, attitudes and beliefs of the health professional (Pulcini et al., 2014). Research in New Zealand to investigate the level of confidence in the safety of standard childhood vaccinations concluded that as health professionals are a highly trusted source of vaccine information, communicating that vaccines are safe may help provide reassurance for parents who ask about vaccine safety (Lee et al., 2018).

Factors that parents cited as counterproductive to deciding to immunise were the inability to have a dialogue with a health professional; the pressure they perceived health professionals exerted on them to comply with immunisation and their belief that the remuneration received by the general practitioner was the sole motivator in promoting vaccines (Evans et al., 2001; McMurray et al., 2004). A systematic review of factors affecting vaccine uptake in young children revealed a lack of trust in health professionals as one of the reasons parents do not vaccinate their children (Smith et al., 2017). Similarly, results from a focus group of parents of incompletely immunised children in England revealed that a subset of this group had little trust in health professionals, especially in relation to the immunisation information provided by these health professionals (Austin et al., 2008). A qualitative systematic review revealed a number of factors that influenced parents' immunisation decision-making in the UK

(Forster et al, 2016). Some of these factors included parents' inability to have an open dialogue with health professionals and perceived pressure to comply with immunisation schedules (Forster et al, 2016). However, a trusting relationship with a health professional was reported as having a positive influence on some parents' immunisation decision-making (Mixer et al., 2007). A qualitative systematic review of factors that influence parents' vaccination decision-making in the UK revealed parents trusted health professionals (Forster et al., 2016).

1.3.3 Sources of information

Parents access multiple sources of information to apprise their immunisation decision-making. However, these sources of information are not always perceived positively by health professionals as helpful in assisting parents' immunisation decision-making.

A qualitative study in the United States of America (USA) found that three discrete groups of parents exist relating to how they make their immunisation decisions and the information sources they access (Brunson, 2013). These groups consisted of acceptors, who rely primarily on social norms to make their immunisation decisions; reliers, who depend mainly on other people for information and advice; and searchers, who seek information on their own, especially from published sources (Brunson, 2013).

Results of a postal questionnaire in England revealed that many of the parents who responded were happy with the information sources available to them (Casiday et al., 2006). Other information sources parents sought out were the media (Hackett, 2008). It has been argued that the publicity surrounding the MMR vaccine and how the media has reported this has contributed to an increased awareness of risk and uncertainty about the safety of the MMR vaccine (Hackett, 2008). Parents' views on the role of the media vary widely (Hilton et al., 2007). The results of focus groups in Scotland revealed that parents either perceived journalists as scaremongers or as valuable and credible information providers (Hilton et al., 2007). Leaflets and information packs were perceived as helpful and influenced, in some instances vaccination decision-making (Casiday et al., 2006; Gellatly et al., 2005). When parents did not find these

information sources useful, they suggested this was because they perceived a health professional represented the Government and was therefore, unable to give impartial advice (Casiday et al., 2006).

The availability of easily accessible information, such as internet sources and a strong peer network have been cited as information sources parents seek out (Gibson et al., 2017). A feasibility study in England revealed that parents cited multiple sources of information such as NHS websites, the practice nurse, leaflets, family members and online parents' fora to obtain immunisation information (Hill & Cox, 2013). With the multiple information sources that parents access, it could be contended that parents have unmet information needs considering they needed to access so many information sources.

1.3.4 Social class

Studies have shown a link between social class and immunisation status. However, the social class of the parent does not always consistently determine whether they chose to immunise their child.

A survey in Italy sought to elicit the views of mothers concerning their children's preschool immunisation status (Impicciatore et al., 2000). The findings of this survey suggested that mothers' attitudes, educational level, and socio-demographic characteristics can influence children's immunization uptake (Impicciatore et al., 2000). In England, results from four focus groups of parents of either completely immunised or incompletely immunised children reported low levels of immunisation associated with a more affluent population (Austin et al., 2008).

Results from other studies are not consistent with these findings and refute the perspective that low socio economic status is linked to low uptake of immunisation. A population based analysis of vaccine uptake records for one million children in Scotland revealed that those who were more affluent tend to be either vaccinated early or not at all (Friederichs et al., 2006). Similar results were found in another survey of parents in Scotland where the majority of non-immunisation parents were from more affluent populations (Macdonald *et al.,* 2004). A more recent retrospective study in

Scotland ranging from 2008 – 2018 found there was a strong association between deprivation and uptake of vaccines, especially the first MMR and the third dose of the primary vaccine (Haider et al., 2019). However, an Australian longitudinal study found that the majority of incompletely immunised infants had parents who were disadvantaged compared to other parents in relation to lower educational attainment and income (Pearce et al., 2015).

In contrast, results from a mixed methods study in London found that the relationship between uptake of the MMR vaccine and socio economic status was not significant (Mixer et al*.,* 2007). However, in this instance, it was difficult to determine the socio economic status of the mother, as the classification of a mother's socio economic status was made on the ward of the borough in which she was residing leading the authors to conclude that the socio economic status assigned to each mother may not have been accurate (Mixer et al*.,* 2007). Similarly, a survey of general practices in Cumbia and Lancashire, England found no association between MMR uptake and social class (Lamden & Gemmell, 2008).

1.3.5 Ethnicity

Ethnicity has been cited in the literature as an influencing factor for parents concerning their immunisation decision-making.

Results from a mixed methods study of parents from London whose children had been vaccinated with the MMR vaccine revealed that the majority of Asian mothers had their child vaccinated with their first MMR vaccine; this was in contrast to the Afro-Caribbean and Caucasian parents who participated in this study (Mixer et al*.,* 2007). Analysis from the focus groups of this study revealed that the Asian group were influenced by their cultural traditions and health beliefs. Furthermore, they followed the advice of their elders; particularly their mothers in-law concerning immunisation advice (Mixer et al., 2007). A systematic review of qualitative studies sought to understand the factors related to ethnicity influencing childhood immunisation decisions of parents from Black Asian Minority Ethnic (BAME) populations living in the UK (Forster et al., 2017). The results of this systematic review revealed that ethnicity affected immunisation

decisions. Factors that were related to ethnicity itself, such as: religion, upbringing, being culturally permitted or acceptable, immigration, and language affected parents' perceived importance of vaccines. Another factor identified from these results showed that some parents' beliefs about immunisation were influenced by their beliefs about biological differences between themselves and the majority population in the UK or a belief that the UK environment was different from their country of birth (Forster et al., 2017).

Given the potential role that ethnicity may play in immunisation decision-making for some individuals, health professionals involved in promoting and administering the MMR vaccine should incorporate consideration of this into their practice.

1.3.6 Other health care issues – Coronavirus disease

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) emerged as a zoonotic virus in the latter part of 2019 and is the causative agent of Coronavirus disease (Covid-19) (Folegatti et al, 2020). Covid-19 continues to impact global health since the WHO declared this virus a pandemic on 13 March 2020. By May 2020, data collected by the WHO, the United Nations International Children's Emergency Fund (UNICEF) and the USA Centers for Disease Control and Prevention (CDC), Gavi and the Sabin Boost Initiative revealed that country lockdown measures had significantly hampered the delivery of immunisation programmes in at least 68 countries (World Health Organization & the United Nations International Children's Emergency Fund, 2020). It was estimated that lockdown measures had put approximately 80 million children under the age of one year living in these countries at increased risk of contracting vaccine preventable diseases (World Health Organization & the United Nations International Children's Emergency Fund, 2020).

In July 2020, the WHO and UNICEF published their annual report concerning immunisation coverage for 195 countries, principally focusing on the diphtheria, pertussis and tetanus (DPT) vaccine (World Health Organization & the United Nations International Children's Emergency Fund, 2020). Data from this annual report revealed that immunisation programmes in low and lower-middle income countries fare worse

on average in comparison to upper-middle and high-income countries. This was especially evident for DPT with approximately 95% of children living in high-income countries vaccinated as compared to an estimated 74% of children living in low-income countries (World Health Organization & the United Nations International Children's Emergency Fund, 2020).

Twenty-four month UK vaccine coverage estimates for all vaccines offered on or after the first birthday (e.g. MMR1, PCV, Hib/MenC and MenB boosters) decreased compared to the previous quarter (Public Health England, 2020b). MMR1 decreased 0.3% to 91.2% compared to the first quarter (Public Health England, 2020c). Coronavirus disease has affected MMR immunisation coverage particularly in England (McDonald et al., 2020). Coverage decreased by 0.3% to 90.7% for MMR1 in England, while at a country level Wales was the only country in the UK to achieve 95% for MMR1 (Public Health England, 2020c). United Kingdom coverage for MMR2 vaccine routinely administered prior to school entry (i.e. at four years of age) decreased 0.2% to 87.4%, while coverage for MMR 2 decreased in England, by 0.2% to 86.7% (Public Health England, 2020c).

1.4 The role of the practice nurse

Heath care professionals involved in the delivery of national immunisation programmes include practice nurses, who are qualified nurses registered with the Nursing and Midwifery Council in the UK (Cox & Hill, 2010). While the majority of practice nurses are employed by general practitioners, an increasing number are being employed by other organisations such as: local community nursing providers, clinical commissioning groups and private companies (The Queen's Nursing Institute, 2015). The role of the practice nurse has evolved and changed over the last 30 years, particularly since the introduction of the new general medical services contract (new GMS) in 2003 (Cox & Hill, 2010). This contract represented a major change to general practice funding with practices rewarded for performance based on quality indicators, which covered 10 clinical domains and aspects of practice organisation, patient experience and enhanced services (Fleetcroft et al, 2008). The additional services

included in the new GMS contract consequently led to increasing roles and responsibilities for practice nurses, as explicated in Table 1.4 (Moger et al., 2014).

Table 1.1 The role of the practice nurse

- Improving population health, using their local connections to understand communities and develop strategies for health improvement
- Supporting self-care and empowering individuals to be more autonomous and in control of their own health while recognizing when they need support or intervention
- Improving quality and services based on local community intelligence and access to the evidence base
- Interfacing with other services such as district nurses, care homes and community pharmacies to avoid hospital admissions and support care within the community
- Signposting patients to support and improving the lives of carers
- Maintaining professional standards
- Ensuring that safe, high quality care is developed and delivered to individuals at each consultation, and that patients are safeguarded
- Delivering and designing ongoing support for people with long-term care needs and ensuring shared responsibility through interdependent working
- Delivering services that are responsive to local population needs
- The team and wider team in the community often having been longstanding team members.

Some elements of the new GMS 2003 contract led the Department of Health to change some of the arrangements: this included the categorisation of services, with distinctions made between essential, additional and enhanced services (NHS Confederation, 2003). As a result, general practices could choose to opt out of the delivery of additional services, such as immunisation. Those general practices that opted out experienced a reduction in their global sum payments of 1-3% depending upon whether they opted out of providing childhood immunisations, adult immunisations or both (NHS England & NHS Health Improvement, 2019). More recently interim findings of the vaccinations and immunisation review recommended that vaccines in the national immunisation programme be classified as essential in order for general practices to be incentivised to meet the WHO target for vaccine

coverage (i.e. 95%) (NHS England & NHS Health Improvement, 2019). Furthermore, the review's findings identified that expanding staffing in general practice, particularly practice nurses, would benefit the delivery immunisation services (NHS England & NHS Health Improvement, 2019). Vaccinations became an essential service in 2020 (British Medical Association, 2020). Subsequently, the plan was to introduce and standardise item of service payments across all routine immunisation programmes over the next two years beginning with the MMR vaccine in 2020/2021 (British Medical Association, 2020).

While immunisations were classified as additional services following the new GMS contract in 2003, research has shown that the majority of general practices continued to be involved in the delivery of the national immunisation programme (Maconachie and Lewendon, 2004). To determine the levels of concern about risks associated with childhood immunisation among principal immunisers a survey of general practices (n = 102) in South and West Devon Heath Authority was conducted (Maconachie and Lewendon, 2004). Seven practices were unable to participate in the survey as they were not involved in delivering vaccines in the national immunisation programme (Maconachie and Lewendon, 2004). Results identified that 78/88 principal immunisers identified themselves as practice nurses with a third of respondents raising concerns particularly about the MMR vaccine. A number of these concerns related to safety (i.e. risks, reactions and side effects of the MMR vaccine) and the need for a second MMR vaccine (Maconachie and Lewendon, 2004). While these survey results are now dated, a high level of knowledge and a positive attitude to immunisation in healthcare practitioners are widely acknowledged as important determinants in achieving and maintaining high vaccine uptake (Dube et al, 2013). The increasing involvement of general practices in immunisation provision in the UK has led to recommendations by the Royal College of General Practitioners (RCGP) General Practice Foundation and the Royal College of Nursing (General Practice Nurse) that all practitioners involved in the delivery of immunisation programmes in the UK should meet competence in immunisation (RCGP and RCN, 2015). In addition to the recommendations of these colleges, foundation training and regular updates are recommended for practitioners

involved in immunisaiton programmes by the National Institute for Health and Care Excellence (NICE) and the Strategic Advisory Group of Experts (SAGE) working group on vaccine hesitancy (WHO, 2014). Despite, these recommendations, there are no mandatory requirements, nor is there a requirement for practitioners who undertake immunisation training to be assessed, leaving to question the effectiveness of immunisation training.

The contribution of practice nurses to health care provision in the UK has been increasingly recognised, as explicated in *The General Practice Nursing Workforce Development Plan* (Health Education England, 2017). This report highlighted the diverse role of the practice nurse in areas such as immunisation, contraception, managing long term conditions, supporting vulnerable groups and those with mental health problems, learning disabilities and dementia (Health Education England, 2017). The complexity of the national immunisation programme with additional new vaccines has been reported by practice nurses as increasing their workload in running immunisation clinics (Baird et al., 2016).

A systematic review of strategies to optimise immunisation uptake of pre-school children in developed countries reported that 98% of infants born in the UK are registered with a general practitioner with parents of these children having their first contact with their general practitioner often relating to the primary vaccination schedule (Williams et al., 2011). This systematic review reported that effective interventions to increase vaccine uptake included parental reminders, which can increase uptake by 11% in the intervention arms (Williams et al., 2011). These parental reminders that were reported included both generic (i.e. telephone calls) and specific reminders (i.e. personalised letters and home visits). Strategies aimed at immunisation providers were also shown to improve immunisation rates with a median change in immunisation rates of 7% when reminders were studied, 8% when educational programmes were studied and 19% when feedback programmes were studied (Williams et al., 2011). Given the variety of clinical settings and socioeconomic populations included in these

studies, results could be generalised, but only to developed counties (Williams et al., 2011).

While factors have been identified that can increase vaccine uptake, there are a number of factors that have been shown to reduce the likelihood of a child been up to date with recommended vaccines such as being from a lone parent family (Pearce et al., 2015) from an ethnic minority group (Forster et al., 2017) and living in urban areas (Bécares et al., 2011).

There has been growing recognition about the contribution of practice nurses, as primary care nurses to national immunisation programmes in acknowledgments from the Chief Nurse for Public Health England and from the Royal College of Nursing (RCN). In her official blog, Viv Bennett as the Chief Nurse for Public Health England commented: “Primary care and public health nurses are central to ensuring that the childhood immunisation programme continues through direct provision of immunisation services and by delivering important messages and advice to parents” Bennett, 2019). The RCN provide guidance for vaccine administrators in the UK with the recognition that the UK childhood immunisation programmes are primarily delivered by practice nurses (RCN, 2021). In further acknowledgement of the role that practices nurse play in national immunisation programmes, the RCN provides specific guidance for practice nurses administering vaccines in patients’ homes and within the general practice setting (RCN, 2021). While there has been growing acknowledgment of the contribution of practice nurses to national immunisation programmes, the success and usefulness of this guidance has not been evaluated in practice to determine its effectiveness. Similarly, the extent to which practice nurses influence and promote vaccination both in policy and research is limited and is an area that needs to be explored considered the well documented role of the practice nurse in the delivery of national immunisation programmes.

The extent of the involvement of practice nurses in other countries on the delivery of immunisation services has been reported in the literature. There are global differences in the interpretation of practice nursing with the title advanced practice nursing (APN)

used to describe the most common types of APN roles namely the Clinical Nurse Specialist (CNS) and the Nurse Practitioner (NP) (Schober, 2013). One of the key health promotion roles of the CNS relates to improving immunisation, similar to the role of the practice nurse in the UK (Bryant-Lukosius et al., 2015). Similar to general practice in the UK, Australian practice services operate as small businesses and funding for providing a diverse range of services is mainly a fee for service model (Halcomb et al., 2017). Practice nurses form one of the largest contributors to the delivery of primary care services in Australia: one of these services includes the provision of immunisation services (Heywood & Lawrence, 2018). Practice nurses in New Zealand work autonomously alongside general practitioner colleagues and undertake triage of acute presentations and routine primary care activities (McKinlay et al., 2011). A survey of general practices in New Zealand revealed that practice nurses estimated that they spent approximately 19% of their time dealing with delegated work, such as immunisations (Finlayson & Raymont, 2012). A survey of practice nurses in Ireland revealed that 100% of all practice nurses surveyed reporting their involvement in immunisation delivery (Bury et al., 2020).

1.5 Significance of the research

The literature to date identifies that general practitioners and health visitors can in some instances influence parental immunisation decision-making relating to the MMR vaccine. However, similar information relating to the practice nurse is limited. This is despite practice nurses' exposure to parents with young children requiring vaccination being substantial both in providing immunisation advice and administrating vaccines in the national immunisation programme in the UK. Therefore, this gap is significant and needs to be explored.

This study contributes new evidence-based knowledge that can be utilised to inform clinical practice, education and research regarding how practice nurses perceive their role and contribution to the uptake of vaccines in national immunisation programmes.

1.5.1 Summary of the research

There were three phases to this study each with their own primary aim. These were as follows:

Phase 1: to conduct an integrative review to ascertain the beliefs and perceptions of practice nurses' influence about the uptake of the MMR vaccine.

Phase 2: to explore the perceptions of practice nurses concerning their role and strategies used to promote MMR vaccine uptake using an exploratory descriptive qualitative design.

Phase 3: to explore how practice nurses engage with parents during their consultations about the MMR vaccine using an exploratory descriptive qualitative design.

1.6 Structure of the thesis

This chapter has provided an overview of immunisation and factors that potentially affect decision-making in this area. The role of the practice nurse in immunisation has also been reviewed. This chapter has concluded with a summary of the rationale for, and significance of the study. Chapter 2 contains an integrative review examining the beliefs and perceptions of practice nurses' influence on the uptake of the MMR vaccine. The methodology of the research is outlined in Chapter 3, which includes the design, aims, data collection, data analysis and ethical considerations used in each phase of the published empirical research. Chapter 4 details the findings of each of the two phases of the empirical research. In the final chapter there is critical discussion of the results in the context of the current body of evidence. Recommendations for future research, practice and education are outlined.

1.7 Summary

MMR continues to be a major societal problem and achieving adequate levels of herd immunity continues to be challenging. Factors that influence parental immunisation decision-making, including the role of health professionals have been explored in this chapter. While practice nurses have been identified as a key health professional involved in the delivery of national immunisation programmes, research to date is

limited on their role and scope of influence. The three phases within this thesis; the integrative review and two qualitative studies have been designed to address this gap in the literature and develop an understanding of how practice nurses interact with parents to influence their MMR decision.

Chapter 2 – Phase 1: Integrative Review

2.1 Introduction

Immunisation is a proven tool for controlling and eliminating life-threatening infections and is the most important way of protecting individuals from vaccine preventable diseases (World Health Organization, 2017). The UK has a structured immunisation programme which continues to evolve with the introduction of new vaccines (Kennedy et al., 2014). Many of the vaccines in the UK national immunisation programme are combined vaccines, of which the MMR vaccine is one such vaccine. It is recommended to be administered when an infant is 12 months and again at pre-school entry age. All national immunisation programmes recommend a two dose schedule of the MMR vaccine and since 2008, the WHO has recommended all countries adopt a two-dose MMR schedule to ensure immunity and prevent outbreaks (World Health Organization, 2010)**.** The UK national immunisation programme is not mandatory, unlike in other European countries, as identified in the Vaccine European New Integrated Collaboration Effort (VENICE) network 2010 survey (Haverkate et al., 2012). The authors of this survey concluded that there needed to be consensus amongst health care professionals in promoting their national immunisation programme to increase vaccine uptake (Haverkate et al., 2012).

This chapter includes the published integrative review concerning the beliefs and perceptions of practice nurses' influence about the uptake of the measles, mumps and rubella vaccine. Relevant literature published since the time of the integrative review has been summarised in the latter section of this chapter.

2.2 Statement of co-authors of joint publications

TO WHOM IT MAY CONCERN

Title of publication:
What are the beliefs and perceptions of practice nurses' influence about the uptake of the measles, mumps, and rubella vaccine?: An Integrative literature review.

Name of candidate:
Marie C. Hill.

Title of research thesis:
Practice nurse influence on the uptake of the measles, mumps and rubella vaccine.

Name of first supervisor:
Professor Leanne Aitken

We, the undersigned, co-authors of the above publication, confirm that the above publication has not been submitted as evidence for which a degree or other qualification has already been awarded.

We, the undersigned, further indicate the candidate's contribution to the publication in our joint statement below.

Signature:

Name: Marie C. Hill
Date: 26 March 2021

Signature:

Name: Professor Debra Salmon
Date: 7 April, 2021.

Signature:

Name: Professor Leanne Aitken
Date: 6 April, 2021

2.2 1 Statement indicating the candidate's contribution to the publication

The co-authored paper in this chapter was accepted for publication with the *Journal of Advanced Nursing.* The details of the co-authored paper including, all authors, are:

Hill, M. C., Salmon, D., & Aitken, L. M. (2019). What are the beliefs and perceptions of practice nurses' influence about the uptake of the measles, mumps, and rubella vaccine?: An integrative literature review. *Journal of Advanced Nursing, 75*(2), 266-276. doi:10.1111/jan.13827 (Accepted 14 July 2018).

The final version of the integrative review meets the requirements of the International Committee of Medical Journal Editors (ICMJE) namely:

1. Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work; AND

2. Drafting the work or revising it critically for important intellectual content.

My contribution to the integrative review included:

- Critical review of the literature
- Undertaking the search strategies
- Data analysis
- Data interpretation
- Writing the article

- Revision of the article
- Approval of the final version

I completed the writing of the final article with methodological and editorial advice from my PhD supervisors and co-authors: Professor Leanne Aitken and Professor Debra Salmon.

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REVIEW PAPER

WILEY JAN Leading Global Nursing Research

What are the beliefs and perceptions of practice nurses' influence about the uptake of the measles, mumps, and rubella vaccine?: An integrative literature review

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Abstract

Aim: The aim of this study was to ascertain the beliefs and perceptions of practice nurses' influence about the uptake of the measles, mumps, and rubella vaccine.

Background: Immunization decision-making for parents is a complex process. Principal health professionals involved in immunization programmes are health visitors, general practitioners, and practice nurses. There is evidence that health visitors and general practitioners influence parental immunization decision-making. However, there is a lack of evidence about the influence of the practice nurse despite their well-documented role in immunization.

Design: Integrative literature review.

Data sources: A systematic search of electronic databases, including CINAHL; Medline; PubMed; Google Scholar; Science Direct; and Scopus from February 1998 – April 2017. Hand searching and reviewing of secondary references were also undertaken.

Review methods: Two reviewers independently screened records on title and abstract. Studies where the beliefs and perceptions of practice nurses about the measles, mumps, and rubella vaccine were explored and were published in English were included. The data were analysed using the integrative review processes. **Results:** Twelve studies were included; these studies were principally descriptive and were of variable methodological quality. Four themes were identified: parental immunization influencing factors, practice nurse characteristics, information and communication, and personal views and concerns. While this review provides an excellent baseline for this information, more recent research conducted in the current policy environment is urgently needed to determine if these views persist.

Conclusion: Immunization training and annual updates are essential for practice nurses to keep abreast with the evidence base underpinning national immunization programmes.

KEYWORDS

beliefs, influence, Measles, MMR, Mumps, perceptions, practice nurse, rubella, uptake, vaccine

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2.3 Relevant literature published since 2018

The integrative review was published in 2018. To capture relevant literature published since the time of the search for the review in April 2017, the same search strategy was repeated (Hill et al., 2019). See Figure 2.1. One Canadian study met the criteria for inclusion. The aim of this study was to understand parents' and nurses' experiences of decision-making about childhood immunisation, specifically MMR and/or diphtheria-tetanus-acellular pertussis (Mossey et al., 2019). See Table 2.1 for a summary of the study's methodology; main findings, including strengths and limitations (Mossey et al., 2019)**.** The inclusion criteria for this study comprised nurses being involved in childhood education and/or administration; registration as a registered nurse or nurse practitioner, ability to understand and speak English and self-identify as responsible for childhood immunisations. While the nurses the Canadian study were not identified as practice nurses, their role involved being responsible for childhood immunisations specifically concerning two vaccines, one of which was the MMR vaccine.

2.3.1 Main results

In the Canadian study, nurses reported being motivated by child protection and protecting the public from vaccine preventable diseases (Mossey et al., 2019)**.** These nurses viewed themselves as content experts not only regarding immunisation schedules but also related to the differences between adverse reactions and anticipated side effects from vaccinations. In their consultations with parents, nurses guided parents towards reputable and evidence-based sources of information. Nurses perceived minimal parental uncertainty about their immunisation decisions which would protect their child, especially when parents believed the information upon which their decision was made. Nurses reported parents weighing up the risks and benefits of vaccination, which often resulted in parents consulting with their family and friends before making a final immunisation decision. In some instances, nurses reported parents believed that vaccines caused neurological damage, which was a view that was difficult to change. Nurses tailored educational sessions to alleviate parental immunisation uncertainty.

2.3.2 Strengths and limitations of the Canadian study

The study highlights the value of acknowledging parents' will to protect their children and their right to make an informed and independent decision relating to immunisation. A limitation of the Canadian study relates how themes were attributed to the sample of six nurses. While the authors provided detail about the data analysis and the emergent themes, it was not clear whether all the themes were similar between the parents and nurses. In addition, the results section (i.e. themes and sub themes) focused predominately on the parents, with minimal references to nurses' perspectives.

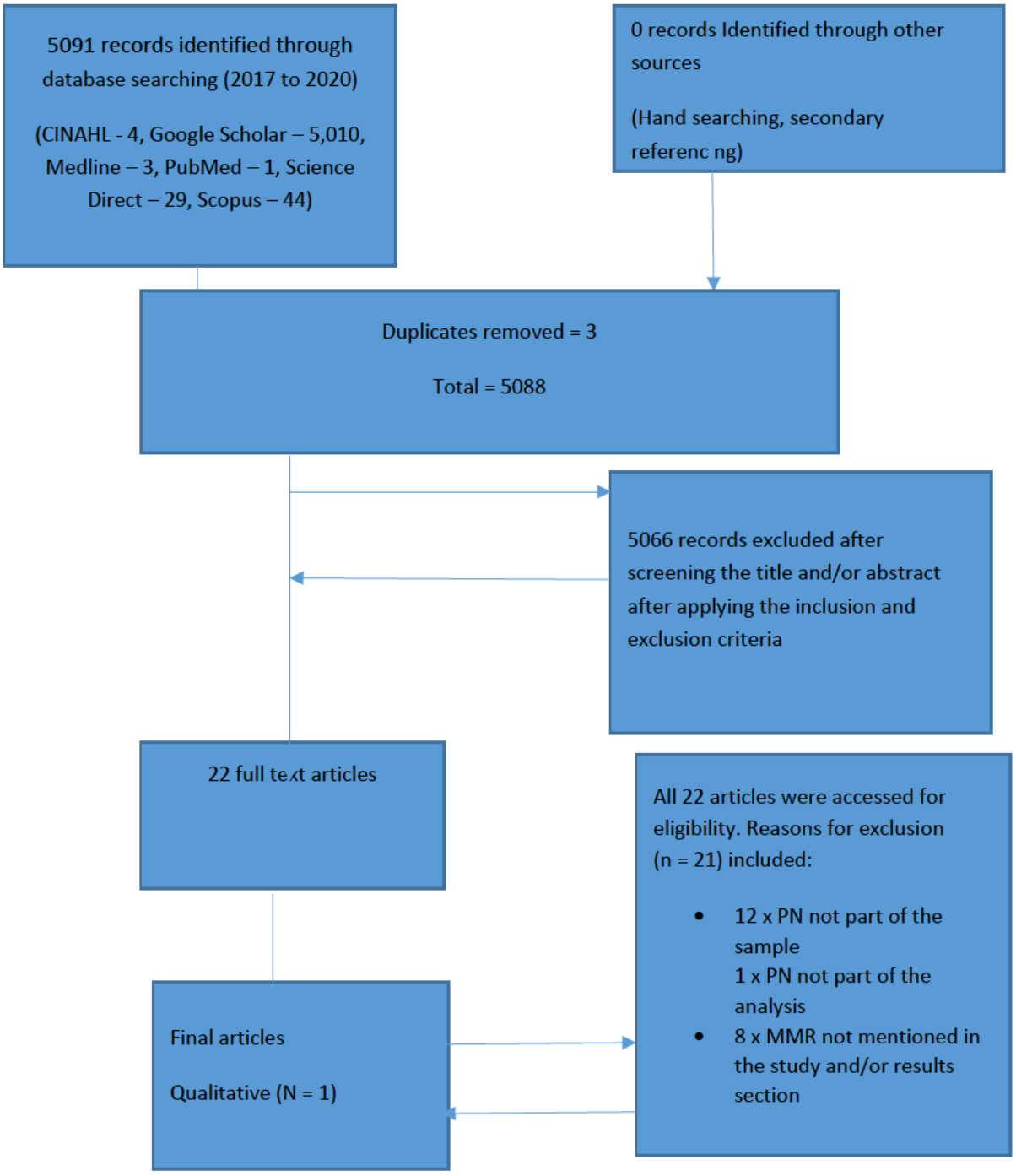


Figure 2.1 Summary of the selection throughout the selection process (2017 – 2020)

Table 2.1 Summary of methodology and main findings

First author, year & country	Participants	Aim	Method	Results (Nurses results reported only)
Mossey et al., 2019 Canada	6 nurses 16 parents	To understand parents' and nurses' experiences of decision-making about childhood immunisation, specifically measles-mumps-rubella (MMR) and/or diphtheria-tetanus-acellular pertussis (Tdap)	Interpretative description approach	Nurses motivated by child protection and protecting the public from vaccine preventable diseases Nurses viewed themselves as content experts not only regarding immunisation schedules but also related to the differences between adverse reactions and anticipated side effects from vaccinations Nurses guided parents towards reputable and evidence-based sources of information Nurses perceived minimal to no parental uncertainty that their immunisation decision would protect their child when the parents believed the information upon which their decision was made

				Nurses reported parents weighing up the risks and benefits of vaccination, which often resulted in parents consulting with their family and friends before making a final immunisation decision. Nurses perceived some parents concluded that vaccines caused neurological damage, a view that was hard to change Nurses tailored educational sessions to alleviate parental immunisation uncertainty

2.3.3 Similarities to the integrative review's findings

The results of the Canadian study are consistent with the integrative review's findings reported earlier in this chapter .These included nurses directing parents to specific and evidence-based sources of information, relating to the theme *information & communication*. In the Canadian study nurses' signposted parents to the Public Health Canada website, whilst in the integrative review, practice nurses referred parents to the internet and other recommended websites.

Practice nurses were attuned to, and acknowledged *parental immunisation influencing factors* such as socio economic status, family, friends and safety concerns about the

MMR vaccine. Similarly, nurses in the Canadian study described the many variables that influenced parents including health care providers, online websites, social media, research reports, opinions of experts, past personal immunisation experiences and family and friends.

While the two themes *practice nurse characteristics* and *personal views and concerns* were evident in the intergrative review, these was minimal evidence of these in the Canadian study, especially the theme *practice nurse characteristics.* In relation to the theme *personal views and concerns*, nurses in the Canada study reported being motivated by child protection and protecting the public from vaccine preventable diseases. Furthermore, they perceived themselves as content experts concerning immunisation. What was not evident in the Canadian study were concerns expressed by the nurses about the safety of the MMR vaccine or the necessity for two doses of MMR that were safety concerns delinated in the integrative review's findings.

3 Conclusion

Practice nurses are involved in the administration of national immunisation programmes. In both the integrative review and the relevant literature published since that time, four themes related to practice nurses' beliefs and perceptions were identified. These included parental immunisation influencing factors, practice nurse characteristics, information & communication and personal views and concerns. Although a comprehensive review provides an excellent baseline for this information, more recent research conducted in the current policy environment is urgently needed to determine if these views persist.

Chapter 3 – Methods

3.1 Introduction

The significance of the diseases; measles, mumps and rubella and the important role of vaccination has been outlined. The integrative review (Phase 1) explored practice nurses' beliefs and perceptions about the uptake of the MMR vaccine and led to the identification of gaps in current knowledge and the conceptualisation for the research questions for both qualitative studies in this thesis (i.e. Phases 2 and 3). While practice nurses have been identified as key health care professionals responsible for the delivery of national immunisation programmes, there is lack of understanding about their influence concerning the MMR vaccine. The methods for the qualitative studies (Phases 2 and 3) are presented in sequential order in this chapter. The philosophical research paradigm used to guide both phases are presented, as well as the rationale for using qualitative research. The study methods and approaches to data analysis procedures are described. Finally, the ethical considerations for both phases are also discussed.

3.2 Purpose and aims

The aims of Phases 2 and 3 were:

Phase 2: to explore which aspects of their role practice nurses perceive to be most influential and the strategies they employ to promote the MMR vaccine.

Phase 3: to understand practice nurses' perceptions about how they engage with parents during consultations concerning the MMR vaccine.

3.3 Design

3.3.1 Qualitative research

Qualitative research begins with assumptions that inform the study of research problems addressing the meaning individuals attribute to a social or human problem (Creswell, 2013). It is further contended that to study a social or human problem qualitative researchers use an emerging qualitative approach to inquiry with the

collection of data sensitive to the individuals under study (Creswell, 2013; Denzin & Lincoln, 2011). Qualitative researchers study social or human problems in their natural setting and attempt to make sense of phenomena in terms of the meanings individuals bring to them (Denzin & Lincoln, 2011). In this context, data analysis is both inductive and deductive and establishes themes which emerge from the data (Creswell, 2013). The final written report or presentation includes the voices of individuals, the reflexivity of the researcher and the report's contribution to the literature (Denzin & Lincoln, 2011).

Qualitatative research was considered as the most appropriate methodology to use for Phases 2 and 3 of the study, as it allowed the opportunity for individuals to share their practice while gaining a complex understanding of the issues being studied (Creswell & Poth, 2018). Qualitative research seeks to generate empirical knowledge about human phenomena for which depth and contextual understanding would be useful, and for which measurement is inappropriate (Thorne, 2016). In the context of Phases 2 and 3 of the study, qualitative research allowed an exploration of the experiences, feelings and perceptions of the practice nurse participants through a holistic account by reporting multiple perspectives and identifying the many factors involved in a situation (Holloway et al., 2017).

3.3.2 Strengths and limitations of qualitative research

It has been argued that no single research method is better than any other and the chosen method will be determined and influenced by a researcher's research objectives (Silverman, 2017). There are strengths and limitations of using qualitative research. Qualitative research design has long been considered the gold standard for understanding individuals' experiences of a phenomena, which is often referred to as the individuals' lived experience (Wadams & Park, 2018). Qualitative research allows for a detailed understanding of the various dimensions of a research question and allows exploration of meanings, beliefs, values and attitudes which corresponds to an in-depth understanding of relationships, processes and phenomena that cannot be reduced to the operationalisation of variables (Queirós et al., 2017).

A challenge for those new to qualitative research is trying to decide what kind of qualitative research they will undertake (Merriam &.Tisdell, 2016). Different writers have identified a diversity of forms and different theoretical perspectives (Patton, 2015; Creswell, 2013; Tesch, 1990). Although, there are guidelines for qualitative researchers for sample size in terms of collecting extensive detail about each site or individual studied, findings cannot be generalised to the wider population (Creswell & Poth, 2018). Another challenge for those new to qualitative research relates to the process of interviewing and theme development, which can be time consuming (Choy, 2014).

3.3.3. Qualitative descriptive design

An exploratory qualitative descriptive design was used for both qualitative studies (Phases 2 and 3). Qualitative descriptive research studies are those that seek to discover and understand a phenomena, a process or the perspectives or world views of the participants involved (Caelli et al., 2003). Qualitative descriptive approaches to nursing and health care research provide a broad insight into particular phenomena and can be used as a stand-alone research design (Doyle et al., 2020). A qualitative descriptive approach is also used to provide straightforward descriptions of experiences and perceptions, especially in areas where little is known about the topic under study (Sandelowski, 2010). Therefore, a qualitative descriptive approach was deemed appropriate for the both qualitative studies (Phases 2 and 3) due to the paucity of research concerning practice nurse influence on the uptake of the measles, mumps and rubella vaccine.

While there is agreement that there is a place in qualitative research for a qualitative descriptive approach, a criticism of this approach relates to borrowing elements from other qualitative methodologies, such as grounded theory, phenomenology and ethnography (Vaismoradi et al., 2013). Despite this, there are recommendations for increasing the credibility of using a qualitative descriptive approach namely: making explicit the theoretical position of the researcher, the congruence between

methodology and methods, the strategies to establish rigor and expanding on the analytical lens through which the data are examined (Caelli et al., 2003).

3.4 Theoretical framework and philosophical perspectives

A theoretical framework has been described as the underlying structure or framework that informs a study (Maxwell, 2012). It has been contended that the theoretical framework of a study is derived from the orientation that the researcher brings to their study (Merriam & Tisdell, 2016). Researchers choose a problem to study based on a deep-rooted interest to them and on its fit with a paradigm of preference (Polit & Beck, 2018). Research paradigms or patterns refer to the philosophical stance of ontology, epistemology and methodology supporting a researcher's belief system that influence the development of a study. There are a number of ways a researcher can identify the theoretical framework to be used (Merriam & Tisdell, 2016). This includes acknowledging the disciplinary orientation of the researcher and the theoretical framework relating to the research. My disciplinary orientation stems from my career in nursing and this was the lens I viewed the areas under study in my PhD. It has been contended that "every discipline has a unique focus that directs the inquiry within it and distinguishes it from other fields of study" (Smith & Liehr, 2008: 1). Writers have reported that the discipline of nursing is formed by a community of scholars, including nurses in all settings, who share a commitment to values, knowledge and processes to guide the thought and work of the discipline (Smith, 2019). Furthermore, it has been argued that any discipline (such as nursing) includes networks of philosophies, theories, concepts, approaches to inquiry, research findings and practices that reflect and explain its distinct perspective (Smith & Parker, 2013). A review of key nursing concepts has revealed the extent of nursing theories from Florence Nightingale's 1859 'Notes on nursing' to the grand theory titled Parse's human becoming paradigm (Parse, 2014). Much of the theoretical work in nursing theory especially in the late 20th century has focused on expressing the relationships among four major concepts namely the *client* as the recipient of nursing care, the *environment* relating to the internal and external surroundings of the client, *health* relating to the degree of

wellness that the client experiences and *nursing*, which are the attributes, characteristics and actions of the nurse providing the care on behalf or in concurrence with the client (Kozier & Berman, 2012). King's theory of goal attainment has been influential in the development of the Phase 2 and 3 studies (King, 1981). In this theory, King identified ten concepts from the nursing literature namely: self, role, perception, communication, interaction, transaction, growth and development, stress, time, and personal space, as essential knowledge for use by nurses (King, 1981). Within this theory a transaction process model was designed, which described the nature of nurse-patient interactions (i.e. nurses purposefully interact and mutually, set, explore and agree to achieve goals) (King, 1981). It has been contended that King's theory offers insight into nurses' interactions with clients and highlights the importance of clients' participation in decisions that influence their care (Kozier et al, 2004). King's theory of goal attainment was relevant to Phases 2 and 3 in terms of how practice nurses described the processes and strategies they reportedly discussed with parents with the ultimate goal of increasing uptake of the MMR vaccine.

A researcher can identify their theoretical framework with attention to the literature that relates to the research area of interest which in this instance was to explore practice nurse influence on the uptake of the MMR vaccine. The integrative review (Phase 1) enabled the identification of what was known about the topic, identify a gap in the literature, why it is important to know it and led to the rationale for undertaking Phases 2 and 3.

A research philosophy describes what a reseacher perceives to be truth, reality and knowledge. Ontological assumptions make claims about what kinds of social phenomena can exist, the conditons of their existance, and the ways in which they are related (Blaikie & Priest, 2019). Epistemology considers how knowledge is created, how we learn about our work, which is important in shaping the methods chosen to study research questions and explicate underestanding (Creswell & Poth, 2018). Methodology refers to the techniques and procedures embraced by a researcher to gain and analyse knowledge (Crotty, 1998). It has been suggested that the ontological

and epistemological positons of a researcher shape the theoretical and methodlogical approach to their study (Lowndes et al., 2018).

These philosophical postions are important to explore, as they define the basis of a researcher's world view. The following sections will begin by exploring my ontological and epistemological postions that underpinned Phases 2 and 3.

3.4.1 Ontological position

An ontological position questions what the nature of reality is (Creswell & Poth, 2018). A realist ontological position assumes that there is one true reality and that all phenomena are objective (Lowndes et al., 2018). Whilst, a relativist ontological position assumes that reality is subjective and that reality is influenced by an individual's experiences, perceptions, society and culture (Siegel, 2004). Within the relativist position, a researcher aims to engage in making sense of an individual's experiences or world view. Upon exploring and reflecting on my philosophical positioning, it is my belief that the world exists with individuals being subjective rather than viewing all phenomena as objective. Furthermore, that their realities are influenced by the existence of different cultural and social contexts. Practice nurses views were shaped by their experiences, perceptions, societal and cultural influences. Therefore, in the context of this study, a relativist position was most appropriate for this work.

3.4.2 Epistemological position

Epistemology refers to the nature of knowledge and it is important (similar to having an ontological stance) for qualitative researchers to philosophically position themselves (Merriam & Tisdell, 2016). There are, similar to ontology, two opposing views regarding epistemology (Lowndes et al., 2018). The first view, similar to the realist ontological perspective suggests that objectivity and the ability to acquire knowledge about the world without any external influence is possible. The second view, similar to the relativist ontological perspective, posits that the subjective constructions of reality influence individuals perceptions of their world view.The

second view was deemed more relevant and therefore, formed the epistemological bases for Pheases 2 and 3. I believed that the practice nurse participants process of meaning making of their world view may influence their knowledge and understanding of their perceptions relating to their influence on the uptake of the MMR vaccine. In additon to which, as is explicated in Chapter 4 – resutls (3 Findings: 3.1 Sample characteristics) and section 4.5.4, characteristics of these practice nurses are not homogenous, which in turn may influence how they construct knowledge within their world of practice (Kelly et al., 2018).

3.4.3 Research paradigms

There are number of recognised research paradigms, such as constructivism, interpretivism, feminism, positivism, post-positivism and critical theory (Kelly et al, 2018). Paradigms are a set of exemplars that address how best to find solutions to research problems (Kuhn, 1962).

Within interpretivism, understanding is embedded in social interaction and in the interpretation of the world (Houghton et al, 2018). Interpretivism's epistemological stance is one of subjectivity, whilst its ontological stance is one of lived experiences, cultural influence and meaning that acknowledges the potential for multiple truths (Kelly et al, 2018; Ryan 2018). The researcher is an interpreter, reflecting a subjectivist stance (Guba, 1990). As explicated by Thorne, in relation to interpretivism:

*"*We draw inspiration from philosophical underpinnings that explicitly capitalize on the perspective that reality doesn't exist "out there" as an objective entity to be discovered but rather is more usefully understood as "socially constructed" through the subjective person who experiences it" (Thorne, 2008: 49).

For the purposes of Phases 2 and 3, an interpretivist stance was taken which allowed me as the researcher to explore socially constructed experiences of practice nurses as they interacted with parents of different cultural and socioeconomic backgrounds.

While interpretivism acknowledges a subjectivist epistemology, the researcher needs to be aware of the impact their own perceptions can have on the research (Houghton

et al, 2012). In relation to the study methods as delineated in this chapter the role of the practice nurse was best clarified and understood through interpretivism and how these practice nurses functioned in the real world.

3.5 Rigor

Strategies to optimise rigor frequently viewed as the gold standard for qualitative research are those outlined by Lincoln and Guba (Polit & Beck, 2018). These criteria for developing the trustworthiness of qualitative research relates to: credibility, dependability, confirmability and transferability (Lincoln & Guba, 1985). These are now explored relating to the Phase 2 and 3 studies.

3.5.1 Credibility

To ensure that the research findings were credible, the participant information sheet provided clarity about the purpose and aim of the Phase 2 and 3 studies. My contact details were provided in the participant information sheet for potential participants to contact me concerning the Phase 2 study. In the Phase 3 study, the research assistant contact details were provided for participants in the participant information sheet.

I undertook all interviews in the Phase 2 study which were transcribed by an experienced external transcriptionist and then analysed by me using content analysis to explore which aspects of their role practice nurses perceived to be most influential and the strategies they employed to promote the MMR vaccine. The emergent themes were supported by participant quotes and reviewed by my PhD supervisors. I provided all participants with the opportunity to comment on their transcripts were accurate records of their views and perceptions. This process of member checking enabled participants to check the accuracy and credibility of these transcripts to decrease the incidence of incorrect data and the incorrect interpretation of data (Harper & Cole, 2012). Only one participant requested a change to their verbatim transcript, as they had revealed the identity of a client in their general practice. I anonymised reference to the client and resent the amended transcript to the participant for review. No further changes were requested by this participant.

In the Phase 3 study, all interviews were undertaken by an experienced research assistant, who then uploaded each interview onto a secure transcription service site. These were transcribed by an experienced external transcriptionist, who I had used for the Phase 2 study. When I received each anonymised transcript from the transcriptionist, I identified each practice nurse in the sequential order that I received transcripts (e.g. Practice Nurse 1, etc.). I then analysed each of the Phase 3 transcripts using content analysis to understand practice nurses perceptions about how they engage with parents during consultations concerning the MMR vaccine. A process of discussion ensured with my PhD supervisors which continued until there was consensus on the codes and themes. This was an iterative process until there was agreement on the final three themes.

3.5.2 Dependability

Dependability refers to the reliability (i.e. stability) of data over time and conditions (Polit & Beck, 2018). The processes used and decisions made during data collection and analysis were documented in depth to ensure dependability of the research findings. Detailed documentation provided an audit trail throughout the Phase 2 and 3 studies. In total there were 30 practice nurse interviews, 15 in Phase 2 and 15 in Phase 3. Data from each interview were coded by me. I defined all the initial codes from the 30 interviews in a coding manual. There was a separate coding manual for the Phase 2 and Phase 3 studies. Then along with one of my supervisors, we independently coded three transcripts, then compared codes for the Phase 2 and Phase 3 studies. The coding manual was refined following discussion, debate and ultimately agreement.

3.5.3 Confirmability

Confirmability refers to the potential for consistency between two or more independent individuals about data accuracy, relevance and meaning (Polit & Beck, 2018). Confirmability relating to the codes and themes was achieved through consultation amongst my supervisors and I. I coded all 30 practice nurse transcripts for Phases 2

and 3 studies, which were then each independently or critically reviewed by my supervisors. As part of my PhD monthly supervisors meetings, a process of reflection and discussion resulted in agreement between my supervisors and I, which led to the identification, refinement and agreement of codes, sub themes and themes. This was an iterative process until there was consensus on the final themes.

3.5.4 Transferability

Transferability is the extent to which qualitative findings have applicability in other settings (Polit & Beck, 2018). Lincoln and Guba asserted that it was a researcher's responsibility to provide enough descriptive data so that individuals can evaluate the applicability of the data to other contexts (Lincoln & Guba, 1985). While it is argued that qualitative researchers do not strive for generalisability, researchers should seek to look at the possibility of application of their results to other settings (Polit & Beck, 2018). In the presentation of Phase 2 and 3 findings, I provided detailed descriptions of data linked to the identified themes from the Phase 2 and 3 studies to enhance the transferability of these findings.

3.5.5 Strategies to mitigate against bias

There are four commonly identified types of researcher bias in qualitative research: questions, sampling, conceptual and anticipated outcome biases (Morse, 2015). In relation to the questions for each phase of the study, I ensured that the questions posed related to the aims of each phase, which were influenced by the context of immunisation policy and literature. Conceptual bias is where a researcher can overjustify particularly that of their data by extrapolating their findings to fit the concept or theory being explored (Morse, 2015). In aiming to mitigate against conceptual bias, I ensured that there were detailed, clear and accurate records of the research process, which was manifest in the data analysis sections for phases of the study (Cooper & Endacott, 2007). Finally, anticipation bias. This can be influenced by a researcher's implicit beliefs, values and assumptions about the world. It was therefore vital that the

findings of Phases 2 and 3 reflected the world view of the practice nurse participants, rather than my world view of these studies aims.

3.6 Reflexivity

Reflexivity was an important part of the data analysis process during the Phase 2 and 3 studies. Reflexivity has been defined as the process of critically reflecting on the self and considering personal values that could affect data collection and interpretation (Polit & Beck, 2018). Reflexivity requires precision about the analytical method and data collection procedures used, and emphasises the researcher's own assumptions and beliefs of how the researcher's presence affects what they are investigating (Dean, 2017).

Dwyer and Buckle explored the implications of the stances of researchers and whether they should be part of the population under study or not, describing the stance of the researcher as either being an *insider* or an *outsider* to the research process (Dwyer & Buckle, 2009). Being an *insider* refers to when researchers conduct research with populations of which they are members or familiar with, so that the researcher shares an identity, language, and experiential base with the study participants (Asselin, 2003). I shared some of the components of being an *insider* with practice nurse participants such as a shared identity (i.e. my previous role as a practice nurse and shared language). While there are benefits to having a shared status as an *insider*, especially in relation to access to participants, as I had for the Phase 2 study, it had the potential to impede the research process. A number of impediments to being an *insider* relate to perceptions of participants' making assumptions of similarity with the researcher and not fully explaining their own experiences in depth and the researcher perceptions being influenced by their own personal experiences of the group under study (Dwyer & Buckle, 2009). The most widely used strategy for maintaining reflexivity is to keep a reflexive journal or diary. Through self-interrogation and reflection, researchers seek to be well positioned to probe deeply and to grasp the experience, process or culture under study through the lens of participants (Polit & Beck, 2018). This involved me as

the researcher needing to be aware that I as an individual bring a unique background, set of values, and a professional identity that can affect the research process. I found that keeping a diary helpful in providing me with time to consider different aspects of my PhD journey during the Phase 2 and 3 studies (see Appendix 2).

The process of being reflexive and keeping a reflective diary ensured that I was led in the analytical process by the research findings for Phases 2 and 3 of the study. The reflexive process enabled me to critially appraise the role I played and how I maybe perceived by participants while conducting interviews in Phase 2 of the study. This was an important factor to consider due to the impact that my presence, current role, preconeived knowledge and experiences could have on the reseach process. I am a senior lecturer in practice nursing and have prior to my current academic role held clinical and managerial posts in practice nursing. The use of a reflexive diary enabled me to be aware how my own world viewpoint concerning immunisation was influencing how I perceived the interview data. Similar to the participants, I shared a background in practice nursing in the UK, although at the time of undertaking Phases 2 and 3 of the study I was not in clincial practice. Keeping a reflective diary enabled me to record my thoughts and feelings during Phases 2 and 3. All the participants in Phase 2 had met me in an educational capacity either involving attending immunisation updates or having previously completed their undergraduate or postgraduate programmes with me as the programme director. It was obvious during a number of the 2014 and 2018 interviews that some participants were hesitant in providing information and in some instances when I asked a question about the uptake of the MMR vaccine in their general practice were apologetic that they did not know the precise percentage uptake. In reviewing the impact that I was having on some of the participants, this determined the decision to employ a research assistant to undertake all 2019 practice nurse Phase 3 interviews. This was a key moment for me in my research PhD journey, as it reinforced how important it was for me to ensure the analysis was guided by the data rather than my own specialist immunisation knowledge. This was especially evident when defending how the codes, sub themes and themes emerged from the data. The

process of peer debriefing with my supervisors enabled me to become more aware of my positionality in relation to the analysis.

Reflexivity enables a researcher to engage in self-understanding about the biases, values and experiences they bring to a qualitative research study (Creswell & Poth, 2018). Reflexivity in research improves transparency in the researcher's subjective role, which includes conducting research and analysing data, and allows the researcher to apply the necessary changes to ensure the credibility of their findings (Darawsheh, 2014; Dean, 2017). One of these considerations was who would undertake the Phase 3 interviews. In this study, while I made my position explicit as the lead researcher in the participant information sheet for the study, it was documented that a research assistant would undertake all interviews. This was to remove potential bias and distortion in the study results that may have occurred if I had been the interviewer, due to my involvement in immunisation education and programme delivery which some participants' may have been exposed to (Polit & Beck, 2018).

3.7 Phase 2: Interviews with 15 practice nurses in 2014 and 2018

3.7.1 Aim

The aim of this phase was to explore which aspects of their role practice nurses perceived to be most influential and the strategies they employ to promote the MMR vaccine.

3.7.2 Setting

The setting for this study was five boroughs in North and East London.

3.7.3 Participants (including sample size)

Practice nurse fora leads were contacted in five boroughs in London with a request to disseminate the study patient information sheet (See Appendix 3) and consent forms (Appendix 4) to practice nurses in each borough. A practice nurse forum is a meeting or medium where ideas, views, public health issues and other health related subject specific areas related to the role of practice nurses are discussed.

A purposive sample of fifteen practice nurses were recruited through practice nurse fora across London. Purposive sampling allowed the advantage of facilitating the selection of participants who had the relevant experience required for the study (Bradshaw et al., 2013). It was the intention in using purposive sampling to include a wide range of practice nurse participants.

There are other non-probability sampling designs that can be used by qualitative researchers, such as convenience, snowball and theoretical sampling (Polit & Beck, 2018). In relation to convenience sampling, while this is efficient, it was not the preferred approach for the Phase 2 study.

The aim of this qualitative study was to explore which aspects of their role practice nurses perceived to be most influential and the strategies they employ to promote the MMR vaccine, and a convenience sample would not provide the most information rich sources (Polit & Beck, 2018). Snowball sampling was not considered appropriate as it requests individuals to make referrals. This approach was considered unsuitable for this study due to the potential for a small sample size due to restrictions in an individual's professional network and that the quality of referrals may be affected by whether the referring sample member trusted the researcher and wished to cooperate (Polit & Beck, 2018). Theoretical sampling is a method used in grounded theory studies and a researcher uses a sample of individuals to study based on their contribution to the development of a theory (Creswell & Poth, 2018). Theoretical sampling was not appropriate for the Phase 2 study, as the study's design was a qualitative descriptive design.

3.7.4 Inclusion and exclusion criteria

Inclusion criteria were registered nurses who were employed in England as practice nurses and were involved in the administration of the Healthy Child Programme: Pregnancy and the First 5 Years of Life and consequently the MMR vaccine (Department of Health, 2009). The exclusion criteria were employment in organisations other than general practice; not currently on the Nursing and Midwifery

Council (NMC) register in the UK and not involved in the administration of the Healthy Child Programme.

3.7.5 Data collection

There were two periods of data collection consisting of in-depth face-to-face interviews in 2014 and in 2018 to explore which aspects of their role practice nurses perceived to be most influential and the strategies they employ to promote the MMR vaccine.

All interviews were undertaken at the relevant nurses' general practice setting. Interviews were held in a quiet undisturbed room identified by each participant and lasted between 40 to 60 minutes.

Open-ended questions were developed that remained the same for both the 2014 and 2018 participants. The development of these questions was informed and influenced by my own expertise in the field of immunisation, consultations with other practice nurses and the current body of evidence relating to immunisation policy at the time of undertaking the interviews. The development of the questions was guided by the aim of the study which was to explore which aspects of their role practice nurses perceive to be most influential and the strategies they employ to promote the MMR vaccine. Questions focused on the practice nurses' views about the MMR vaccine, their discussions and consultations with parents and immunisation resources they accessed. Prior to the commencement of the first practice nurse interview in 2014, two practice nurses who would not be involved in the study were consulted for their views on the questions in relation to clarity. No alterations were requested to be made. See Appendix 5 for the list of questions.

I conducted all interviews, which were audio recorded. The interviews were transcribed verbatim by an independent transcriber. All practice nurses were assigned a different participant number when extracts of their interviews were used to preserve anonymity.

3.7.6 Data analysis

Data were analysed using qualitative content analysis. Qualitative content analysis involves close reading of textual matter, where relevant parts of the text are re organised into analytical categories (Krippendorff, 2019). See Appendix 6. Qualitative content analysis was used in the study to describe a phenomenon, which was to discern how practice nurses perceive their role in immunisation for measles, mumps and rubella. In this approach, the analysis starts with identifying and quantifying certain words or content in text with the purpose of understanding the contextual use of the words or content (Krippendorff, 2019). This ensured that I coded the narrative that was relevant to answering the research question. In order to produce a convincing account when undertaking a qualitative study, researchers are recommended to keep clear and accurate records of the research process in detail (Cooper & Endacott, 2007). I documented the definitions of all the initial codes from the 15 interviews in a coding manual. Then along with one of my supervisors we independently coded three transcripts, then compared codes. The coding manual was refined following discussion and agreement. I then coded the remaining transcripts that were each critically reviewed by at least one of my other two supervisors. A process of reflection and discussion resulted in agreement amongst all authors, which led to the identification, refinement and agreement of codes, sub themes and themes. This was an iterative process until there was consensus on the final number of themes.

3.8 Phase 3: Interviews with 15 practice nurses in 2019

3.8.1 Aim

To understand practice nurses perceptions about how they engage with parents during consultations concerning the MMR vaccine.

3.8.2 Setting

The settings for 13 of the practice nurse participants were general practices across London, while two participants' were located in general practices in Derby, England.

3.8.3 Participants (including sample size)

A convenience sample of 15 practice nurses was recruited. In this instance, as well as recruiting via practice nurse fora across London, the Association of Academic General Practice Nurse Educators (AAGPNE) agreed to distribute the Phase 3 recruitment flyer to general practices in their area to generate participants. The AAGPNE is a UK wide association consisting of practice nurse educators in higher education institutions involved in providing undergraduate and postgraduate programmes for practice nurses. Once the research assistant was contacted by interested practice nurses, she then disseminated the participant information leaflet (Appendix 7) and the consent form (Appendix 8).

3.8.4 Inclusion and exclusion criteria

The inclusion criteria included practice nurses who were employed to administer the Healthy Child Programme: Pregnancy and the First 5 Years of Life (Department of Health, 2009).The exclusion criteria consisted of all other registered nurses who were not employed in general practice; not registered on the NMC in the UK or not involved in the administration of the national immunisation programme.

3.8.5 Data collection

All semi structured in depth interviews were conducted in 2019. Questions were developed to ascertain the factors that influence practice nurses in their consultations with parents about the MMR vaccine, the strategies they use to guide these consultations, the information sources used and practice nurses' education needs concerning the MMR vaccine (See Appendix 9 for the interview questions). Interviews were conducted by a research assistant. The research assistant was purposefully employed because she did not have a background in the areas of immunisation and public health with the aim of reducing potential bias.

3.8.6 Data analysis

Interviews were analysed using qualitative content analysis. This form of analysis involves precise reading of textual matter, where relevant parts of the text are re

organised into analytical categories (Krippendorff, 2019). See Appendix 10.The use of qualitative content analysis in this study enabled me to determine how practice nurses engaged with parents during their consultations about the MMR vaccine. The analysis started with identifying certain words or content in the text (i.e. in this case the practice nurse interviews) with the purpose of understanding the contextual use of the words in these interviews (Krippendorff, 2019).

During the coding process, I defined all codes from the interviews in a coding manual. Along with one of my supervisors, we independently coded two transcripts. Following discussion, the coding manual was refined until there was consensus between us. I then coded the remaining 13 transcripts, which were critically reviewed by at least one of the other supervisors. This resulted in a process of discussion amongst my supervisors at our pre-arranged supervisory meetings. This process continued until there was concordance on the codes, sub themes and themes between my supervisors and I. This was an iterative process until there was agreement on the final number of themes, of which there were three.

3.9 Ethical considerations

Researchers must address ethical issues in any research with human beings or animals (Polit & Beck, 2018). During the process of both planning and designing a qualitative study, researchers need to consider ethical issues that may arise, as well as planning how these issues need to be addressed (Creswell & Poth, 2018). I reflected on and explored the ethical considerations for developing both phases of the study.

3.9.1 Justice

Justice concerns the equitable distribution of benefits and burdens of research with the selection of participants based on a study's requirements and not on their vulnerabilities (Polit & Beck, 2018). Furthermore, the right to fair treatment includes other obligations, such as researchers treating participants who decline to participate in the study in a non-prejudicial way. Adhering to this principle I ensured that in both

phases of the study it was made explicit in each of the participant information sheets that participants had a right to decline to continue in the study at any time during the study without participants having to proffer an explanation why they wished to withdraw and importantly that this decision would be accepted in a non-prejudicial way.

Justice refers to the need to treat individuals fairly and equitably. This means researchers considering recruitment and the justification for sampling strategies and site selection (Creswell & Poth, 2018). I provided justification for my recruitment and sampling strategies and site selection in both phases, as described previously in this chapter. In relation to the latter, the preferred site selection for Phase 3 participants was their general practice where participants were employed, in Phase 3, participants confirmed their preference to be interviewed by phone by a research assistant.

3.9.2 Anonymity and confidentiality

The ethical duty of confidentiality refers to a researcher's obligation to safeguard entrusted information (Turcotte-Tremblay & Mc Sween-Cadieux, 2018). All researchers seek to understand and submit to explicit requirements about confidentiality in relation to the process and product of their research (Thorne, 2016). Participants in a study have the right to expect that the data they provide will be kept in strict confidence and that their right of privacy is protected through confidential procedures (Polit & Beck, 2018).

In relation to the two phases of the study, participants' confidentiality and anonymity were ensured by securing participant data. This was done by coding participant names to preserve the anonymity of participants. Each practice nurse participant was allocated a unique number in the sequential order that they were interviewed starting from the first practice nurse interviewed in 2014 (e.g. PN 1). I was the only person who knew the identity of the 2014 and 2018 practice nurse participants who I interviewed. Storage of research data and documents in a secure location are recommended (Creswell & Poth, 2018). I stored all transcriptions and audio recordings in a locked cupboard; the identity of the location only known to me. I had frequent meetings with

the research assistant who I employed to undertake the 2019 interviews, who followed the same principles of adhering to maintaining participant confidentiality and data storage for Phase 3.

3.9.3 Consent

An important procedure for protecting study participants involves obtaining their informed consent (Polit & Beck, 2018). Informed consent for research is one that includes personal interactions, the informed consent document, and an individual's decision about whether to participate in research (Hallinan et al., 2016). For both phases of the study, participants were instructed to read the participant information sheet first and only when they had read and understood the data in this document to then sign the consent form. In each participant information sheet, potential participants had contact details of either me (2014 and 2018 interviews) or the research assistant (2019 interviews). Interviews, whether face to face (2014 and 2018) or telephone (2019), only commenced once the consent form had been signed by the participant and received by either me or the research assistant. Prior to starting an interview, all participants were made aware that they could withdraw their consent at any time during the interview or afterwards.

3.9.4 Beneficence

Within the healthcare profession, beneficence has traditionally been identified as an important ethical value encompassing a number of principles such as altruism, charity, mercy and humanity (Caldwell et al., 2014). Beneficence imposes a duty on researchers to minimise harm and maximise benefits for participants (Polit & Beck, 2018). I promoted the benefits of participants being involved in the research as practice nurses having a clearer understanding on the role of the practice nurse on influencing and enhancing uptake of the MMR vaccine. I emphasised the key role that participants played in the interviews and the control they had in relation to whether they decided to continue. As a registered nurse on the NMC register, I must adhere to The Code,

which includes treating individuals with kindness, respect, compassion as well as upholding their human rights (Nursing and Midwifery Council, 2018).

3.9.5 Non maleficence

Non-maleficence can be defined as the obligation to avoid doing harm to individuals and is a fundamental principle of health care and features in all professional Codes of Conduct (Avery, 2017). This is explicit in the Code for nurses, midwives and nursing associates:

> "Be aware of, and reduce as far as possible, any potential for harm associated with your practice"
> (Nursing and Midwifery Council, 2018: 17).

In both phases of the study participants were not subjected to risks of harm or discomfort. Prior to turning on the audio recorder in Phase 2, I informed participants that I would be asking a number of questions and encouraged participants to ask me to repeat and seek clarification on any question during the interview process. This was to ensure that participants were comfortable in seeking clarification from me. As explicated in section 3.6 some participants in Phase 2 apologised when they did not know the herd immunity percentages for the MMR vaccine in their general practices. I reassured any participant who did not have this information that it was their views about the MMR vaccine and their consultations with parents that was important for me to obtain. Similarly, in Phase 3 and on my review of these transcripts, participants were encouraged to provide as much information as possible. The research assistant, who was an experienced researcher and interviewer did not have a background in public health, so on occasions she sought clarification from participants when they mentioned certain vaccines in an abbreviated form that she was unfamiliar with. Participants when asked for clarification provided this to the research assistant.

3.9.6 Ethical review boards and committees

The development of ethical review boards and committees, whose approval has to be sought, and received prior to the start of any research project is now a key feature for

anyone seeking to carry out research (Robson & McCartan, 2016). In order to meet this mandatory requirement, I received ethical approval to undertake my research from the Proportionate Review Sub-committee of the NRES Committee South Central (14/11/2012; REC reference number: 12/SC/0653). See Appendix 11.

There were two other occasions where I needed to receive ethical approval for substantial and non-substantial changes to my study.

The first amendment related to a substantial change to my PhD supervisory team. This related to the replacement of my previous two PhD supervisors with Professor Leanne Aitken and Professor Debra Salmon. See Appendix 12 - Favourable result for REC reference: 12/SC/0653, Amendment number 1 (05/06/2017). IRAS project ID: 106636.

The second amendment related to a non-substantial change to my supervisory team, including the addition of another supervisor (Dr. Jane Chudleigh) and a research assistant (Dr. Gabriella Romano). See Appendix 13 for: Notification of Non-Substantial/Minor Amendments(s) for NHS Studies. (Dated 19 and 20 March 2019 respectively) **and** 'Favourable result for REC reference: 12/SC/0653. IRAS project ID: 106636.

3.9.7 Reflections on changes to the study design and methodology

Section 3.6.6 detailed three ethical amendments that were obtained during the course of the PhD. The initial ethical approval was awarded by the Proportionate Review Sub-committee of the NRES Committee South Central on 14 November, 2012. At the time of this application it was considered that a broad approach to the study would be the most appropriate strategy as this would enable a range of options with regard to interviewing various groups involved in immunisation (i.e. practice nurses, general practitioners, health visitors and parents). At the time of receiving initial ethical approval, the integrative review to explore the beliefs and perceptions of practice nurses about the uptake of the MMR vaccine had not been completed and therefore, the findings were not available to influence and guide decision-making about the empirical work. The integrative review followed the processes as outlined by

Whittemore & Knafl (2005) to include studies using any research (i.e. qualitative, quantitative and mixed methods). The processes recommended by these authors have been explicated in Section 2.6 – Data extraction and synthesis (Whittemore & Knafl, 2005). The findings of the integrative review were a turning point in the PhD journey in terms of both the focus and the population to be studied. Firstly, the background literature revealed the lack of research concerning the role and influence of practice nurses despite their well-documented responsibility with regard to the administration of vaccines in national immunisation programmes. This contrasted with available evidence showing the influence of general practitioners and health visitors concerning the MMR vaccine. Secondly, 60% of the final 12 articles for synthesis in the integrative review were 10 years or older and therefore, may not reflect current opinion and practice of practice nurses' beliefs and perceptions about their influence on the uptake of the MMR vaccine. For these reasons, the purpose of the next phase of the PhD (Phase 2) was changed to address whether the views and beliefs of practice nurses persisted, which now made the PhD more focused on a specific health professional group, rather than broader groups of health professionals and parents. A substantial change to the original ethics application was approved on 5th June, 2017.

I undertook all 15 interviews in Phase 2. The aim of these was to explore which aspects of their role practice nurses perceived to be most influential and the strategies they employed to promote the MMR vaccine. The process of interviewing practice nurses in the Phase 2 study was another turning point in the PhD journey as explicated in section 3.6 – Reflexivity. In critically appraising the role I played and how I might be perceived by participants by conducting interviews, I identified a need to minimise this influence .An independent researcher with no professional knowledge of the practice topic was employed to conduct the remainder of the interviews. Consequently, the third ethics application was a non-substantial amendment to add a research assistant to my supervisory team (Dr. Gabriella Romano).

The findings of the Phase 2 study provided an understanding of practice nurses' perceptions of the most important aspects of their role when promoting the MMR

vaccine including strategies implemented in practice to achieve these. However, these data highlighted that what was still unknown was how practice nurses engaged with parents during their MMR consultations. This led to undertaking further research (Phase 3) to address practice nurses' perceptions about how they engage with parents during consultations concerning the MMR vaccine.

The ability to be flexible and change the focal point of the PhD demonstrated responsiveness to the emerging findings. The research had therefore, become more focused addressing the deficits highlighted in the integrative review concerning the role and influence of practice nurses on the uptake of the MMR vaccine. While the findings of the Phase 2 and 3 studies reveal the extent to which practice nurses provide information to parents to inform their immunisation decision-making, these studies were not designed to determine if they influence, or to what extent they influence, parental immunisation decision-making. Instead, results of these studies provide insight concerning the practice nurse role so that future research can explore the views of parents in particular as well as other professional groups (e.g. health visitors, general practitioners) involved in the delivery of national immunisation programmes to determine the extent to which practice nurses influence parental immunisation decision-making.

3.10 Conclusion

In summary, this chapter described the methods of a two phase (Phases 2 and 3) exploratory descriptive qualitative design and the rationale for using this design. The first phase explored which aspects of their role practice nurses perceive to be most influential and the strategies they employ to promote the MMR vaccine. The second phase sought to gain an understanding of the perspective of practice nurses concerning their MMR consultations with parents. The data of both phases were analysed using qualitative content analysis. Rigor of qualitative research and ethical considerations employed in both phases were also discussed.

Chapter 4 – Results

4.1 Introduction

Practice nurse are key health professionals involved in the delivery of national immunisation programmes. Despite research examining the roles of other health care professional groups and their influence on the uptake of the MMR vaccine, there is limited knowledge about practice nurses' influence on the uptake of the MMR vaccine. This gap in knowledge was the catalyst to undertake research to explore practice nurses' immunisation role.

The aims of the study were to explore which aspects of their role practice nurses perceive to be most influential and the strategies they employ to promote the MMR vaccine (Phase 2 published) and to understand practice nurses perceptions about how they engage with parents during consultations concerning the measles, mumps and rubella (MMR) vaccine (Phase 3 publication, under review). Each of these phases are reported in sequential order in the format of the journal publication as follows:

Phase 2: Hill, M. C., Salmon, D., Chudleigh, J., & Aitken, L. M. (2021). How do practice nurses perceive their role in immunisation for measles mumps and rubella 2014 - 2018? A Qualitative Study*. Journal of Advanced Nursing;* 77(2): 948–956.

Phase 3: Hill, M. C., Salmon, D., Chudleigh, J., & Aitken, L. M. How practice nurses engage with parents during their consultations about the MMR vaccine? A Qualitative Study. *Primary Health Care Research & Development* 22(e20): 1 – 7. Doi: 10.1017/S1463423621000256

4.2 Statement of co-authors of joint publications

TO WHOM IT MAY CONCERN

Title of publication:
Practice nurses perceptions of their immunisation role and strategies used to promote measles, mumps and rubella vaccine uptake in 2014 – 2018: A qualitative study.

Name of candidate:
Marie C. Hill.

Title of research thesis:
Practice nurse influence on the uptake of the measles, mumps and rubella vaccine.

Name of first supervisor:
Professor Leanne Aitken.

We, the undersigned, co-authors of the above publication, confirm that the above publication has not been submitted as evidence for which a degree or other qualification has already been awarded.

We, the undersigned, further indicate the candidate's contribution to the publication in our joint statement below.

Signature:

Name: Marie C. Hill
Date: 26 March, 2021

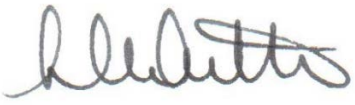
Signature:

Name: Professor Debra Salmon
Date: 7 April, 2021.

Signature:

Name: Dr. Jane Chudleigh
Date: 8 April, 2021

Signature:



Name: Professor Leanne Aitken
Date: 6 April, 2021

4.2 1 Statement indicating the candidate's contribution to the publication

The co-authored paper in this chapter has been published in the *Journal of Advanced Nursing.* The details of the co-authored paper including, all authors, are:

Hill, M. C., Salmon, D., Chudleigh, J., & Aitken, L. M. (2021). Practice nurses perceptions of their immunisation role and strategies used to promote measles, mumps and rubella vaccine uptake in 2014 – 2018: A qualitative study. *Journal of Advanced Nursing*; 77 (2): 948-956.

The final version of the qualitative study meets the requirements of the International Committee of Medical Journal Editors (ICMJE) namely:

1. Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work; AND

2. Drafting the work or revising it critically for important intellectual content.

The first author's (Hill) contribution to the qualitative study included:

- Critical review of the literature
- Participant enrolment
- Undertaking all interviews
- Data analysis
- Data interpretation
- Writing the article
- Revision of the article
- Submission for peer review to the *Journal of Advanced Nursing*

Practice nurses' perceptions of their immunization role and strategies used to promote measles, mumps, and rubella vaccine uptake in 2014 – 2018: A qualitative study

Marie C. Hill[1] | Debra Salmon[1] | Jane Chudleigh[1] | Leanne M. Aitken[1,2]

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Funding information

Abstract

Aim: The aim of this study was to explore which aspects of their role practice nurses perceive to be most influential and the strategies they employ to promote the MMR vaccine.

Design: Qualitative study employing in depth interviews.

Method: Fifteen London based practice nurses, nine in 2014 and six in 2018, took part in semi-structured interviews that were audio recorded and transcribed verbatim. Qualitative content analysis was used to systematically manage, analyse, and identify themes.

Results: Analysis of data identified aspects of their role practice nurses perceived to be most influential (the themes) including: promoting vaccination, assisting parents' to make informed decisions, and provided insight into how they used specific strategies to achieve these in practice. These themes were consistent over both phases of the study.

Conclusion: The findings provide an understanding of: (i) the practice nurses perceptions of the most important aspects of their role when promoting the measles, mumps, and rubella vaccine; and (ii) the strategies they implemented in practice to achieve these. The latter included assisting parents in their immunization decisions and was facilitated by practice nurses engaging with parents to provide relevant evidence to address parent queries, dispel misconceptions and tailor strategies to promote the measles, mumps, and rubella vaccine.

Impact: This study addresses the paucity of literature available that specifically explores practice nurses' perceptions of their role concerning the measles, mumps, and rubella vaccine. The findings reveal how practice nurses promote the measles, mumps, and rubella vaccine by identifying strategies to enable parents to make informed decisions. At a time of an increasing incidence of measles, practice nurses have an important public health role in achieving herd immunity levels for measles, mumps, and rubella.

KEYWORDS

immunization, MMR, perception, practice nurse, role, vaccine

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors . 948 |

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4.3 Introduction

The incidence of measles is increasing globally. Immunisation is recognised as the most significant intervention to influence global health in modern times. Practice nurses are a key member of the primary care team responsible for delivering immunisation. However, little is known how practice nurses perceive this role especially concerning how they engage with parents during their immunisation consultations for the MMR vaccine. The following section introduces the results from the Phase 3 study, whose aim was to understand practice nurses perceptions about how they engage with parents during consultations concerning the MMR vaccine.

4.4 Statement of co-authors of joint publications

TO WHOM IT MAY CONCERN

Title of publication:
How practice nurses engage with parents during their consultations about the MMR vaccine? A Qualitative Study

Name of candidate:
Marie C. Hill.

Title of research thesis:
Practice nurse influence on the uptake of the measles, mumps and rubella vaccine.

Name of first supervisor:
Professor Leanne Aitken.

We, the undersigned, co-authors of the above publication, confirm that the above publication has not been submitted as evidence for which a degree or other qualification has already been awarded.

We, the undersigned, further indicate the candidate's contribution to the publication in our joint statement below.

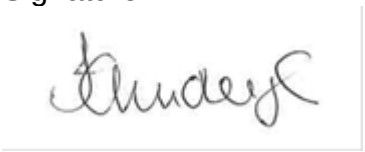
Signature:

Name: Marie C. Hill
Date: 26 March, 2021

Signature:

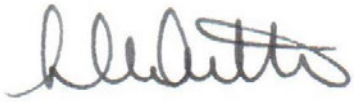
Name: Professor Debra Salmon
Date: 7 April, 2021.

Signature:



Name: Dr. Jane Chudleigh
Date: 8 April, 2021

Signature:



Name: Professor Leanne Aitken
Date: 6 April, 2021

4.4 1 Statement indicating the candidate's contribution to the publication

The co-authored paper in this chapter is currently under review.

The details of the co-authored paper including, all authors, are:

Hill, M. C., Salmon, D., Chudleigh, J., & Aitken, L. M. How practice nurses engage with parents during their consultations about the MMR vaccine? A Qualitative Study

The final version of the qualitative study meets the requirements of the International Committee of Medical Journal Editors (ICMJE) namely:

1. Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work; AND

2. Drafting the work or revising it critically for important intellectual content.

The first author's (Hill) contribution to the qualitative study included:

- Critical review of the literature
- Participant enrolment

- Undertaking all interviews
- Data analysis
- Data interpretation
- Writing the article
- Revision of the article
- Submission for peer review to the *Journal of Advanced Nursing*

4.5 Phase 3 study

How practice nurses engage with parents during their consultations about the MMR vaccine: A Qualitative Study

4.5.1 Abstract

Aim:

We aimed to understand practice nurses' perceptions about how they engage with parents during consultations concerning the measles, mumps and rubella (MMR) vaccine.

Background:

The incidence of measles is increasing globally. Immunisation is recognised as the most significant intervention to influence global health in modern times, although many factors are known to adversely affect immunisation uptake. Practice nurses are a key member of the primary care team responsible for delivering immunisation. However, little is known how practice nurses perceive this role.

Methods:

Semi structured interviews were undertaken with 15 practice nurses in England using a qualitative descriptive approach. Diversity in terms of years of experience and range of geographical practice settings were sought. These interviews were recorded, transcribed verbatim and open coded using qualitative content analysis to manage, analyse, and identify themes.

Findings:

Three themes were derived from the data: engaging with parents, the informed practice nurse and dealing with parental concerns: strategies to promote MMR uptake. During their consultations, practice nurses encountered parents who held strong opinions about the MMR vaccine and perceived this to be related to the parents' socio-demographic background. Practice nurses sought to provide parents with tailored and accurate sources of information to apprise their immunisation decision-making about the MMR vaccine.

Keywords:

Practice nurse, factors, influence, strategies, measles-mumps-rubella vaccine, health promotion, immunisation.

4.5.2 Introduction

Immunisation has been cited as the most significant intervention to influence global health in modern times (World Health Organization, 2020). National immunisation programmes have resulted in a steady decline in child morbidity and mortality (Haider et al., 2019). Vaccines, such as the measles, mumps and rubella (MMR) vaccine, protect against these diseases by conferring immunity (Hakim et al., 2019). However, in order to confer immunity to a significant portion of a population (referred to as herd immunity), the World Health Organization (WHO) recommends that 95% of vaccine eligible people are immunized against vaccine preventable diseases (Haider et al., 2019). Therefore, it is important for health professionals, such as practice nurses, involved in the delivery of national immunisation programmes to strive to achieve herd immunity levels for MMR.

Several factors have been cited as influencing parental immunisation decisions concerning the MMR vaccine. These include: socio demographics such as ethnicity, social class, sources of information (e.g. family, friends, social media), immunisation history, access to immunisation services, weakening the immune system, risk perception of vaccine preventable diseases, and information from healthcare professionals (Bystrom et al, 2020; Romijnders et al, 2019; Forster et al, 2017; Forster et al, 2016; Mixer et al., 2007; Hilton, Petticrew & Hunt, 2007; Austin et al., 2008; Hackett, 2008; Lamden & Gemmell, 2008). Other factors reported to influence parental immunisation decision-making related to fear of vaccination side effects, distrust in the MMR vaccine and the influence of the anti-vaccination lobby reported in the media (Larson et al., 2015).

The incidence of measles has been increasing globally with 9.8 million cases of measles and 142,000 deaths in 2018 (World Health Organization, 2019a). However, by November 2019, case numbers had risen dramatically and had tripled compared with the same period in the previous year (World Health Organization, 2019b).

Data from the European region revealed 82,596 people contracted measles in 2018 (Thornton, 2019). The majority of measles cases were linked to two countries namely: Ukraine (53,218) and France (2,913) (Gallup, 2019). The United Kingdom (UK) has also seen an increasing incidence in measles from 124 cases in 2017, rising to 611

cases in 2018 (Public Health England, 2019). However, the incidence of measles in England and Wales has recently shown a reduction with data for the first quarter in 2020 revealing 507 measles cases compared to 648 cases for the first quarter in 2019 (Public Health England, 2020b).

Practice nurses have been identified as one of the key healthcare professionals involved in the delivery of national immunisation programmes in the UK (Maconachie & Lewendon, 2004; Joyce & Piterman, 2011). The Chief Nurse for Public Health England has endorsed the significant contribution of practice nurses as leading the delivery of these immunisation programmes (Bennett, 2019). Furthermore, the Royal College of Nursing has affirmed the important public health role of practice nurses in the delivery of national immunisation programmes (Royal College of Nursing, 2018). Therefore, this study addresses the important aim which is to understand practice nurse perceptions about how they engage with parents during consultations concerning the MMR vaccine. This information is particularly relevant and necessary due to the increasing incidence of measles globally. The secondary aim is to ascertain what strategies practice nurses use to promote the MMR vaccine.

4.5.3 Methods

4.5.3.1 Design

In our study, we used a qualitative descriptive approach to explore a phenomena, which was to gain an understanding of the perspective of practice nurses concerning their MMR consultations with parents (Graneheim et al., 2017). Qualitative descriptive studies offer a comprehensive summary of an event and researchers conducting such studies seek an accurate accounting of events or of participants' meanings (Sandelowski, 2000). The use of a qualitative descriptive approach allowed us to gather rich descriptions about the phenomenon being explored in an area where there was minimal research. The consolidated criteria for reporting qualitative research (COREQ) checklist was used in the reporting of this study (Tong et al., 2007). See Supplemental Table 1.

4.5.3.2 Participants

Convenience sampling was used to recruit participants. A flyer was distributed to practice nurse fora in London and to a national association of general practice nurse educators. All practice nurses who responded to the initial study invitation consented to participate in the study, with none withdrawing their informed consent. The inclusion criteria included practice nurses who were employed to administer the Healthy Child Programme: Pregnancy and the First 5 Years of Life (Department of Health, 2009). The exclusion criteria consisted of: all other registered nurses who were not employed in general practice; not registered on the Nursing and Midwifery Council in the UK or not involved in the administration of the national immunisation programme.

4.5.3.3 Data collection

Semi structured one to one interviews were conducted from May to October, 2019. Questions were developed: to ascertain the factors that influence practice nurses in their consultations with parents about the MMR vaccine; the strategies they use to guide these consultations; the information sources used and practice nurses' education needs concerning the MMR vaccine. See Appendix 1 for the interview questions. Interviews were undertaken by a research assistant either by telephone or at a venue of choice identified by the participant. Interviews lasted between 14 and 44 minutes and audio recorded by a research assistant, purposefully employed who did

not have a background in the areas of immunisation and public health. This was to remove potential bias and distortion in the study results that may have occurred if the principal author (MH) had been the interviewer. This was due to her involvement in immunisation education, which some participants' may have been exposed to.

4.5.3.4 Data analysis

Interviews were analysed using qualitative content analysis. This form of analysis involves precise reading of textual matter, where relevant parts of the text are coded into analytical categories (Krippendorff, 2019). The use of qualitative content analysis in this study enabled MH to determine how practice nurses engaged with parents during their MMR consultations. The analysis started with identifying certain words or content in the text (i.e. in this case the practice nurse interviews) with the purpose of understanding the contextual use of the words in these interviews (Krippendorff, 2019).

During the coding process, MH defined all codes from the interviews in a coding manual. MH and JC independently coded two transcripts. Following discussion, the coding manual was refined until there was consensus between both authors. MH then coded the remaining 13 transcripts, which were critically reviewed by at least one of the other co-authors (LA or DS). This resulted in a process of discussion amongst all authors. This process continued until there was concordance on the codes, sub themes and themes amongst all authors (MH, LA, JC and DS). This was an iterative process until there was agreement on the final number of themes, which were: engaging with parents, the informed practice nurse and dealing with parental concerns: strategies to promote MMR uptake.

4.5.3.5 Rigor

Credibility was evidenced through the process of peer debriefing with the co-authors (LA, DS and JC). A characteristic of good qualitative research is for the inquirer to make their positon explicit in their writings. This is the concept of reflexivity (Creswell & Poth, 2018). Reflexivity in research improves transparency in the researcher's subjective role, which includes conducting research and analysing data, and allows the researcher to apply the necessary changes to ensure the credibility of their findings (Darawsheh, 2014; Dean, 2017). One of these considerations was who would

undertake the study's interviews. In this study, while MH made her position explicit as the lead investigator in the participant information sheet for the study, she confirmed that a research assistant would undertake all interviews.

4.5.4 Results

Fifteen practice nurses consented to be interviewed; all were female. There was diversity in the academic levels of participants' nursing qualifications. These ranged from certificate (n = 3); diploma (n = 3); degree (n = 7); postgraduate diploma (n = 1) and masters (n = 1). Participants described their self-identified ethnic origin as: White British (n = 9); White European (n = 2); Australian (n = 1); British Asian (n = 1); South American (n = 1) or Caribbean (n = 1).

Five participants were employed full time (37.5 hours/week) and the remaining 10 were employed part time from 16 – 36 hours/week. The length of time these participants were employed as a practice nurse ranged from eight months to 30 years (Median 17, Mean 15). Thirteen were from London, two were from Derby, England.

The principal focus of this study was to ascertain how practice nurses engaged with parents during their consultations concerning the MMR vaccine. Qualitative content analysis yielded three themes: engaging with parents, the informed practice nurse and dealing with parental concerns: strategies to promote MMR uptake.

4.5.4.1 Engaging with parents

Practice nurses described encountering parents who held strong opinions about the MMR vaccine, which they perceived as contributing to vaccine hesitancy. In this regard, parents were either refusing the MMR vaccine or conflicted on whether to immunize their children or not. Practice nurses reported that parents refused the MMR vaccine without articulating a reason or were concerned that their child's immune system was too immature to receive this vaccine.

> *I have had situations as well where, a child's come in for their, let's say eight-week jabs, and the mum brings up MMR immediately that they don't want to have it*. *Obviously I explain that they don't have it until they're a year old anyway* (PN 4, 2019)

> *We have a few families and-, who think that their children's immune system is too immature at one* [year]*, and so they'll come back maybe when they're four or five* [years of age] (PN 8, 2019)

The practice nurse participants' highlighted the socio demographics of their practice population and how this influenced parental immunisation decision-making. This related to how different cultures perceived the MMR vaccine, especially those from an Eastern European or Somali background.

> *We also have quite a few Eastern Europeans who decide not to give any vaccinations at all, not just with measles, mumps and rubella; any vaccinations* (PN 1, 2019)
>
> *…we do have a Somali population where I work and they tell me that they have a lot of Autistic Spectrum Disorder among the children in their community, and they worry that if they give their own child, when they are still one at this stage, if they give them the MMR vaccine, the child will get the same condition* (PN 3, 2019)

Practice nurses acknowledged parents' decisions and sought to ensure that parents were in receipt of accurate information concerning the MMR vaccine. Practice nurses displayed understanding about the differing cultural perceptions and dilemmas of their practice populations relating to the MMR vaccine.

4.5.4.2 The informed practice nurse

It was important for these practice nurses to have a strong evidence base in order to engage with parents. Practice nurses advised parents about the importance of their children receiving vaccines at the appointed times as delineated in the national immunisation programme, especially if their children were late receiving their vaccines. This was particularly evident in relation to the MMR vaccine. Practice nurses provided contemporary sources of information to assist parents with their immunisation decisions and expertly dealt with questions concerning vaccine content and side effects.

> *I always give what's recommended at the right time, unless the parents, obviously, have forgotten and they arrive late. So, if they arrive late for their 13 months or their preschool boosters, where MMR is one of the vaccinations, I will give it to them. I'd say, 'It's better to have it than not to have it* (PN 2, 2019)

> *Then, obviously, we need to show them* [parents] *our immunisation schedule. So, once we show it to them and explain the effect, the side effect, they're quite happy to go on and take it* (PN 9, 2019)

Although PN recognised the importance herd immunity, they were not always confident that parents understood the definition of herd immunity. Despite this, practice nurses revealed how achievement of herd immunity levels protected those children who could not receive this vaccine, especially when there were local outbreaks of measles and mumps.

> *…the only thing I want to say is I think we practice nurses, we all want the uptake to be great, we all want to get the herd immunity* (PN 7, 2019)

> *…we have had an outbreak of, of measles and mumps in this area, and we can say, 'Look, these diseases are coming back. It's only because we're getting good herd immunity that will actually protect. 'We're also protecting the more vulnerable children; the ones who can't have it for whatever medical condition that they may have* (PN 10, 2019)

A key part of practice nurses' consultations involved dealing with parental questions about the MMR vaccine, especially about the gelatine content of one of the two MMR vaccines available in the UK national immunisation programme. Gelatine is a substance derived from the collagen of animals and porcine gelatine (Public Health England 2020c). In our study practice nurses advised parents there was an alternative MMR vaccine available without gelatine.

> *There may be an issue around the gelatine content with the measles, mumps and rubella because of our patients often a lot of them are Muslim so we explain we have got a measles, mumps and rubella vaccine that has no gelatine in it* (PN 1, 2019)

> *But, the other one* [MMR vaccine] *also uses pork gelatine, and pork gelatine is not accepted by certain communities because of their religious beliefs* (PN 3, 2019)

Practice nurses also endeavoured to reassure parents and confirm that they understood vaccine side effects.

> *…once we get their consent, once we give them all the information and make sure that they really thoroughly understand the side effects. A lot of counselling, reassurance* (PN 9, 2019)

Practice nurses advised parents to access recommended sources of information about the MMR vaccine, such as NHS websites and leaflets. Furthermore, they cautioned parents about relying on certain internet sources.

> *I try and encourage all parents to use the NHS website…and I also urge a little bit of caution with online fora and looking into the background of any advice that they're taking from the internet. We always have leaflets available to back things up for the relevant age group or the immunisations* (PN 5, 2019)

> *I usually go on the NHS website, print information about MMR. I also direct them to the Public Health* [England] *and the immunisation site* (PN 12, 2019)

As well as ensuring parents had access to the most contemporary immunisation information, practice nurses were encouraged to avail themselves of immunisation updates by their employers, so that their knowledge was current and evidence-based.

> *And then on the NHS web…they do a lot with immunisation. Every immunisation change, they send to us through an email and sometimes there's a touch of eLearning training as well* (PN 7, 2019)

> *…where I work they provide us with, with regular updates. We have like three updates a year, in the classroom, immunisation updates* (PN 13, 2019)

Practice nurses highlighted the importance of having a strong evidence base concerning changes to vaccines in the national immunisation programme. This was to ensure that they were able to address parental questions, as well as directing parents to reputable web sites and information sources about the MMR vaccine.

4.5.4.3 Dealing with parental concerns: strategies to promote MMR uptake

Practice nurses described that a major concern expressed by parents related to their perceived link between MMR and autism. Parents made an association between MMR and autism, as autism was often diagnosed around the time of the first MMR vaccine.

> *And so that's when you diagnose it* [Autism] *and that goes hand-in-hand with having an MMR vaccine. So, they just associate the autism with the MMR, don't they, rather than that's <u>just</u> when you start to diagnose these things* (PN 8, 2019)

> *…they seem to think it* [MMR] *has some relation to autism, and both of the parents concerned have got older children with autism* (PN 13, 2019)

Practice nurses reported that parents expressed their reservations about the number of vaccines recommended in the national immunisation programme. Consequently,

they sought to diffuse these concerns by reassuring parents about the safety of the number of vaccines infants received at any one time and how an infant's immune system could cope with receiving multiple vaccines.

> *…it's mainly the number of vaccines on the children, they're very worried about, and we have to reassure them they're very, very small doses* (PN 3, 2019)

> *…some parents just think having three vaccines is too much in one go…we point out that, if their child puts their hand in mud then in their mouth, it's getting thousands of germs, and things that their immune system is going to have to cope with. And their bodies can easily cope with these multiple vaccines* (PN 15, 2019)

Practice nurses used a number of different strategies to promote the MMR vaccine that included recommending parents have an initial appointment with the practice nurse to discuss vaccines prior to an immunisation appointment. However, practice nurses were keen that parents were not pressurised into making a decision and offered parents the opportunity to return for further appointments prior to making a decision.

> *I mean, in my ideal world we'd have…an appointment before the immunisation appointment, where me and parents can sit down and discuss everything and explain what all the vaccines are and why we give them* (PN 4, 2019)

> *…I think the most important thing, really, is to try and not get into conflict with people, to leave the door open* (PN 5, 2019)

Practice nurses were aware of the variety of information sources that influenced parents' immunisation decision-making. These included family, friends and online sources. Practice nurses acknowledged that not all parents' information sources were credible.

> *…maybe they haven't got access to the internet in the kind of area that I'm working in, and there's too much relying on word-of-mouth from friends or family* (PN 5, 2019)

> *…and often their information doesn't come from any real scientific basis; it's usually something that they've heard or they've read online on a chat group or something* (PN 11, 2019)

Practice nurses noted the influence that measles outbreaks and travel to countries with a high incidence of measles had on parental immunisation decision-making. This led to, in some instances parents requesting the MMR vaccine prior to when infants would be recommended to have their first MMR vaccine at 12 months of age.

> *Sometimes they* [parents] *hear of an outbreak and they're quite keen. I think last summer there were a lot of people travelling back to Eastern Europe or they were going off to Israel to visit the areas where there were outbreaks of measles, and they were coming in with their children under a year and wanting them to have the MMR* (PN 11, 2019)

Practice nurses identified how religious leaders influenced some parents MMR decision-making.

> *…there was an outbreak of MMR with the Jewish community…and the way we got through to them* [parents], *we went through the rabbi and the rabbi told everyone to come. So, uptake is now great* (PN 7, 2019)

Practice nurses continued to deal with the legacy of the now retracted Wakefield et al publication in their consultations with parents (Wakefield et al., 1998). Despite the duration of time since this publication and subsequent retraction, parents still continued to express concerns about the alleged link between the MMR vaccine and autism. This made it important for practice nurses to discuss and explain these discredited research findings with parents.

> *…again, about autism and about Andrew Wakefield's research. That still keeps coming back, even though it's been disputed and thrown out. And it doesn't seem to matter how often we say, 'The Autism Society actually recommends that you have it. 'There's no proof'… it's still coming through, even after all these years* (PN 10, 2019)

> *The Lancet, published a paper by Dr Andrew Wakefield, and there was a very small cohort, but he was trying to prove or disprove that there is a link between autism, and bowel disease and, the administration of the measles, mumps and rubella vaccination* (PN 14, 2019)

In summary, practice nurses identified a number of strategies to promote the uptake of the MMR vaccine. Their ability to engage with parents was facilitated by their robust evidence base to address parental concerns and provide reassurance about the MMR vaccine.

4.5.5 Discussion

Practice nurses endeavoured to provide tailored information to assist parents' immunisation decision-making, especially about the MMR vaccine. They considered how parents' immunisation decisions were influenced according to their socio demographic characteristics and by their religious beliefs. Practice nurses worked with

religious leaders to provide guidance to members of the community they served. It was important for these practice nurses to have a contemporary evidence base to be able to address these parental concerns and dispel misinformation concerning the MMR vaccine.

In our study, practice nurses were attuned to how parents' socio demographic characteristics influenced their immunisation decisions. Practice nurses described using strategies that were tailored to address concerns specific to different ethnic backgrounds. This is consistent with the key recommendations made from a survey based study of adolescents and parents to increase uptake of adolescent immunisations in the United States (Greenfield et al., 2015). This survey concluded that health care professionals needed to be aware of differing health beliefs amongst ethnic groups to enable them to tailor their consultations to address cultural specific vaccine concerns (Greenfield et al., 2015). Tailoring consultations to a specific ethnic group to increase immunisation uptake was found to be effective in an intervention study in New Zealand (Turner et al., 2017).

Tailoring involves the provision of information to a specific individual based on characteristics related to the areas of interest that are unique to that person (Kreuter & Skinner, 2000). The purpose of tailoring information is to increase the relevance of the message. Communicating with messages that are specific to an individual has been found to be more effective than broad ranging messages at changing behaviour (Conway et al., 2017). However, there have been mixed results about the effectiveness of specific interventions. A randomised trial tested standard care discharge instructions compared to discharge instruction in combination with an information prescription individualised to each patients learning style preference in hypertensive patients in the United States (Koonce et al., 2011). In this trial there was no significant difference between the groups in hypertension knowledge, although the group that received the tailored intervention reported higher satisfaction scores (Koonce et al., 2011).

In our study, practice nurses identified parents' frequent use of online sources of information, many of which practice nurses perceived as not credible. This in turn led practice nurses to caution parents on the use of certain online sources of information and guided them to use recommended sources to apprise their MMR decision-making.

Furthermore, these practice nurses needed to articulately and sensitively deal with the legacy of the now retracted Wakefield et al research study and diffuse misinformation about this research. In this regard, practice nurses ensured that parents had accurate data about the Wakefield et al research, which was guided by their strong and contemporary immunisation evidence base. There is minimal understanding why particular individuals and societies are sensitive to misinformation about health. This has led to health promotion and public health researchers paying attention to the potential of the internet as a tool to spread health related information (Chew & Eysenbach, 2010). A systematic review to explore the spread of health related misinformation on social media revealed that there is an increasing trend in published articles on health related misinformation, with the most commonly associated topics concerning misinformation relating to vaccination (Wang et al., 2019). Findings from an online survey in Indonesia revealed that the sharing of information on social media without verification was predicated by a number of factors, such as internet experience and belief in the reliability of the information (Khan & Idris, 2019). This survey additionally identified that the perceived self-efficacy of individuals to detect misinformation on social media was predicted by their income and educational level (Khan & Idris, 2019).

All practice nurses in our study ensured they had access to contemporary sources of immunisation information and all reported attending yearly immunisation updates. Furthermore, these practice nurses described availing of other immunisation sources of information to supplement their knowledge to ensure that their clinical practice was evidence-based. Lifelong learning through continuing professional development (CPD) is an essential component to provide health care professionals with the opportunity to keep updated in their clinical practice (Rankin & Armstrong, 2017). It has been contended that CPD is an integral part of both professional and personal development to actively promote critical reflexivity and higher order thinking in relation to professional practice (Hayes, 2016). In England, The Code contains the professional standards that registered nurses, midwives and nursing associates must adhere to in order to maintain their registration with the Nursing and Midwifery Council (Nursing and Midwifery Council, 2018). One of the four professional standards in The Code is to practise effectively and to do so, registrants must ensure they always

practise with the best available evidence and maintain the knowledge and skills required for safe and effective practice (Nursing and Midwifery Council, 2018).

4.5.5.1 Implications for practice

Our study illustrates how practice nurses engage with parents to promote the MMR vaccine. The study findings' emphasises how practice nurses need to take into account different parental socio demographic characteristics during their MMR consultations. All practice nurses in our study reported attending annual immunisation updates and accessed other recommended immunisation sources of information. A key recommendation for training is to incorporate strategies to enable practice nurses to engage with parents from different socio demographic groups concerning their MMR consultations. Many of the practice nurses in our study needed to deal with misinformation. It would be beneficial for annual updates to deal with strategies to counteract misinformation in the media.

4.5.5 2 Strengths and limitations

Despite the well documented role of practice nurses in national immunisation programmes, there is limited description of how practice nurses' perceive their role during their consultations with parents concerning the MMR vaccine. The sample was self-selected and therefore, this group of practice nurses could be a highly engaged group within their professional group. Although a small number of the participants in our study practiced in locations outside London, further research is needed to ascertain whether similar themes exist across wider geographical areas in the UK. The study is further limited by a lack of a wider advisory group or patient and public involvement and this is recommended for more extensive studies.

4.5.6 Conclusion

Practice nurses in our study were attuned to the many factors that influenced parental immunisation decision-making about the MMR vaccine, including socio demographics, online sources of information, family and friends. They tailored their consultations with parents to take into account these factors. In order to mitigate against misinformation, practice nurses signposted parents to recommended NHS websites to inform their immunisation decision-making.

Our study has identified the extent to which practice nurses engage with, and promote the uptake of the MMR vaccine manifested by the strategies they utilised in their practice.

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Conflict(s) of interest

None.

Ethical standards

The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional guidelines on human experimentation (i.e. Proportionate Review Sub-committee of the NRES Committee South Central Berkshire) and with the Helsinki Declaration of 1975, as revised in 2008. The research assistant obtained written informed consent from all participants prior to their interview.

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Appendix 1 –

Practice Nurse 2019 interview questions

- Can you tell me about a typical working week as a practice nurse?
- Can you tell me about the size and population of your general practice?
- What are the challenges in your practice area relating to immunisation?
- How do you communicate to parents concerning the MMR vaccine?
- What are the challenges facing your consultations in relation to the MMR vaccine?
- When a parent attends for the MMR vaccine, tell me what you would say to them?
- How do you deal with parents who are uncertain about vaccinating with the MMR vaccine?
- How informed are parents before coming to see you concerning the MMR vaccine?
- Where do parents get their information concerning the MMR vaccine?
- Where do you recommend parents to get information?
- How do you keep up to date with changes to the national immunisation programme, particularly the MMR vaccine?
- Are you able to avail of opportunities to keep up to date with changes to the national immunisation programme, especially the MMR vaccine?
- What specific information do you need about the MMR vaccine when either attending immunisation updates or accessing online information?
- Has the process and requirements around revalidation influenced these opportunities?
- What is your general practice's uptake for MMR at 12 months and at school age?

At the end of the interview, elicit the special category data

- How would you describe your own racial or ethnic origin?
- Can you describe your gender?
- What are your formal qualifications?
- In relation to your continuing professional and personal development and immunisation, can you discuss what this is to date?
- Can you tell me how long you have been working as a registered nurse?
- Can you tell me how long you have been working as a practice nurse?
- Are you working as a practice nurse on a full or part time capacity and how many hours per week?

Chapter 5 – Discussion

5.1 Introduction

Practice nurses have been identified as one of the key health professionals involved in the administration and delivery of national immunisation programmes. The integrative review highlighted a gap in the existing literature. This led to data being collected over two phases to explore: which aspects of their role practice nurses perceive to be most influential and strategies they employed to promote the MMR vaccine (Phase 2) as well as their perceptions about how they engage with parents during their MMR consultations (Phase 3). While practice nurses' involvement in national immunisation programmes has been well documented, uncovering the strategies used to ensure client centred practice and engagement represents an important new contribution to our understanding of their influence on the uptake of the MMR vaccine.

Chapter four provided the results of two qualitative studies (Phase 2 and Phase 3; hereafter referred to as the empirical studies) presented as two peer reviewed publications. Phase 2 is published, while Phase 3 is currently under review. As each paper incorporates a discussion of distinct findings, in this chapter, a broader approach to discussing the findings as a whole is taken. Drawing on the findings of the empirical studies, themes that will be explored in this discussion include: the role of information to inform and influence vaccination decision-making and optimising service provision. The strengths and limitations of this body of empirical work are also considered. Finally, recommendation for future research, practice and education are discussed.

5.2 The role of information to inform and influence vaccination decision-making

The role of information to apprise and influence vaccination decision-making by parents was an important finding of the empirical studies. This related to both information practice nurses seek out and use as part of their clinical practice and the information parents seek from practice nurses including other information sources, such as family, friends and the internet. This was not only confined to how practice nurses and parents sought out information, rather it was the exchange of information between practice nurses and parents. In the empirical studies, practice nurses

endeavoured to provide accurate information to assist parents' immunisation decision-making about the MMR vaccine.

5.2.1 Information sources accessed by practice nurses

Practice nurses described the importance of evidence-based information sources, which they incorporated into their immunisation consultations. Keeping abreast of contemporary sources of information and research influenced their clinical practice and the information they were able to provide to parents about the MMR vaccine and other vaccines in the national immunisation programme. Evidence-based practice requires that decisions about health care should be based on the best available, contemporary and relevant evidence (Straus & Sackett, 2005). A cross sectional study in Norway revealed that although nurses may have a positive attitude towards evidence-based practice, this is not always evident in their practice (Stokke et al, 2014). This was not consistent with the findings of the empirical studies where practice nurses reported the importance of having a robust evidence-base to inform their clinical practice.

Lifelong learning through continuing professional development (CPD) is an essential component to provide health care professionals with the opportunity to keep updated in their clinical practice (Rankin & Armstrong, 2017). It has been asserted that CPD is an integral part of both professional and personal development to actively promote critical reflexivity and higher order thinking in relation to professional practice (Hayes, 2016). In the UK, The Code contains the professional standards that all registered nurses, midwives and nursing associates must adhere to in order to maintain their registration with the Nursing and Midwifery Council (Nursing and Midwifery Council, 2018). One of the four professional standards in The Code is to practise effectively and to do so, registrants must ensure they always practise with the best available evidence and maintain the knowledge and skills required for safe and effective practice (Nursing and Midwifery Council, 2018). The ability of practice nurses in the empirical studies to remain updated with the frequency of changing immunisation information illustrated how they adhered to The Code by ensuring their clinical practice was underpinned by a strong evidence base (Nursing and Midwifery Council, 2018). While CPD is often achieved through systematic learning opportunities integrated into health facility protocols and on-the-job training, less structured mechanisms for learning and

development are also available to health care professionals, such as professional reading, and reflections on one's own experiences (Giri et al., 2012). Accessing information via a range of sources is not uncommon and can complement each other. A systematic review undertaken in Australia on the effectiveness of distance learning strategies for CPD for rural allied health practitioners found that satisfaction and learning outcomes to be on par when technology based delivery compared to face to face modes of delivery (Berndt et al., 2017). A survey of CPD advanced teaching methods of paramedics in Ireland revealed that practical learning through hands-on skills stations proved most effective in both short and medium-term knowledge and skills retention (Knox et al., 2013). However, a systematic review of 17 studies to determine the effectiveness CPD programmes to change targeted clinical knowledge and practice amongst clinicians to improve patient outcomes revealed only two studies that reported positive improvements in patient outcomes (Phillips et al., 2019). Practice nurses in the empirical studies used a variety of learning opportunities to access evidence-based immunisation information. This included receiving monthly vaccine update newsletters from the Department of Health website, attendance at annual immunisation updates and reading about research related to immunisation. However, similar to the systematic review by Phillips et al., (2019), there was little evidence in the empirical studies of the impact of the CPD practice nurses undertook on immunisation outcomes. Therefore, it would seem further evidence is needed regarding which practice nurse CPD activities lead to improved outcomes in terms of MMR uptake.

5.2.2 Process of information exchange

Practice nurses in the empirical studies discussed the importance of achieving herd immunity and stated that they promoted the uptake of the MMR vaccine during their consultations with parents. Practice nurses perceived the purpose of this exchange of information to be aimed at ensuring parents were aware of both the personal and wider implications of vaccine decision-making. Despite this, practice nurses reported that they were not always confident that parents understood the definition of herd immunity. This is important since if parents are not aware of the goal of the immunisation programme (i.e. to achieve herd immunity), it is very difficult for practice nurses and parents to work together to achieve this.

Information exchange is important for shared decision-making and has been explored globally in general practitioner settings (Crispin et al., 2017). Shared decision-making provides a process for incorporating research evidence, along with the clients' values, preferences and circumstances, into the patient-clinician discussions about a health decision (Albarqouni et al, 2019). The Charles et al model of shared decision-making has information exchange as one of its components. This model describes information exchange as comprising of: information flow; a two-way dialogue; type of information shared; and, amount or sufficiency of information shared (Charles et al., 1999). It is during the process of information exchange that clients and health care professionals share their values, beliefs and lay knowledge, or their expertise and resources, respectively (Charles et al., 1999). Results in the empirical studies described how practice nurses sought to engage with parents in information exchange to mitigate misinformation concerning the MMR vaccine and promote uptake of this vaccine.

Practice nurses in the empirical studies stated that they sought to inform parents about the benefits of herd immunity not only to protect their clients' children but the general population. There are direct and indirect benefits of herd immunity, the former includes protection of the vaccinated individual, resulting in a reduced chance of infection, whilst the latter relates to the protective effects observed in unvaccinated populations (Kim et al., 2011). A systematic review explored interventions used to assist populations to understand herd immunity (Hakim et al., 2019). Interventions used consisted of using videos, presentations, brochures, web based and interactive simulation leading the authors to recommend that effective communication about herd immunity can increase vaccine intentions (Hakim et al., 2019). One of the findings of a survey to assess vaccine hesitancy in the UK population using a 10 point vaccine hesitancy scale found that 55% of respondents who replied to item 10 on this scale 'Vaccines are not needed for disease that are not common anymore', were either undecided or agreed with the statement (Luyten et al., 2019). The authors concluded that this raised the possible misunderstanding in the UK population about the need to maintain herd immunity levels (Luyten et al., 2019). In order to address this misunderstanding practice nurses in the empirical studies reported emphasising the need to engage effectively with parents, but how this could be achieved was not always apparent. A willingness of health care providers to listen to parental concerns,

encourage questions and provide accurate information is essential for developing rapport and trust (Diekema, 2013). Research in Australia examining doctors and nurses' consultations with vaccine hesitant parents revealed that rapport building, communicating care for both the parent and child, exhibiting depth of vaccination specific communication skill and immunisation content knowledge were key strengths to enhance their consultations (Randall et al, 2020). Practice nurses in the empirical studies stated that they listened to, and responded to parents' concerns and addressed queries and in so doing perceived that they had built a positive rapport with parents to promote the MMR vaccine. Although practice nurses in the empirical studies recognised the importance of striving to achieve herd immunity levels, as mentioned, they reported not always being confident that parents understood this definition. Nevertheless, many practice nurses described in the empirical studies how achievement of herd immunity levels protected those children who could not receive this vaccine. It is estimated that at least 93% to 95% of a population needs to be vaccinated with two doses of a measles-containing vaccine, such as the MMR vaccine to reach herd immunity and prevent outbreaks (De Serres et al., 2000). A short educational intervention in the USA to increase awareness of measles herd immunity resulted in an increase in parents understanding of herd immunity as well as heightened concerns about the disease of measles (Griffith et al, 2020). While practice nurses in the empirical studies did not report defining herd immunity to parents during their consultations, a key recommendation would be for practice nurses to explain to parents the importance of achieving herd immunity: the benefits to their child and to public health in future consultations.

Parental perceptions that a discussion with health professionals was inadequate in length and depth, and possibly dismissive and difficult, has been associated with lower vaccine uptake (Brown et al, 2010). To mitigate against having insufficient time to address parental questions and concerns, practice nurses in the empirical studies stated that they recommended parents return for additional discussion(s) concerning immunisation issues. This elongated process of information exchange between practice nurses and parents concerning the MMR vaccine was perceived to facilitate their ability to promote the uptake of this vaccine although again, no direct evidence of the actual impact of this on immunisation uptake was reported.

Practice nurses in the empirical studies described addressing parental concerns relating to vaccine content and side effects, which they believed was enhanced by their robust evidence base.

Fear of vaccination side effects, distrust in the vaccine, lack of perceived risk of vaccine-preventable diseases and the influence of anti-vaccination reports in the media have been factors reported to impact on parental immunisation decision-making (Larson et al., 2015). A recent survey of 2,600 parents in the UK found that 10% had chosen not to give their child the MMR vaccine with the commonest reason cited as fear of side effects (Royal Society for Public Health, 2018). A survey to assess vaccine hesitancy in the UK population using a 10 point vaccine hesitancy scale (VHS) found that four percent responded as hesitant to all 10 items in the scale and 90 percent to at least one of the 10 items (Luyten et al., 2019). The authors identified two subscales within the VHS; lack of confidence in the need for vaccines and aversion to the risk of side effects (Luyten et al., 2019).

Practice nurses in the empirical studies were empathetic to their practice populations' dilemmas concerning the MMR vaccine. Practice nurses reported being mindful of providing accurate and individualised care to parents to facilitate their immunisation decision-making by addressing queries about the MMR vaccine, providing reassurance about the vaccine's safety and promoting uptake. Research that has explored parental knowledge and beliefs concerning immunisation advocate that health care providers must support each individual parent in making decisions about having their children immunised (McCauley et al., 2012). Therefore, practice nurses in the empirical studies perceived it as important to acknowledge parents' views about the MMR vaccine to support and inform their decision-making. This illustrated how practice nurses who are identified as one of the key health professionals involved in the delivery of the national immunisation programme endeavoured to provide accurate and evidence-based information to meet the needs of their specific patient population to promote uptake of the MMR vaccine.

5.2.3 Information sources used by parents

Practice nurses in the empirical studies reported how parents relied on a myriad of information sources, which informed and influenced their immunisation decision-

making. Previous studies have highlighted that parents obtain their information from family, friends, the media and the internet (Freed et al., 2011; Grabiel et al., 2013; Kennedy et al., 2011). Practice nurses stated that information was frequently and increasingly reported as accessed via the internet by parents. However, online information sources are not always considered as reliable, and the variability in the quality, readability, and accuracy of contents has led to suggestions that online information sources may lead to greater confusion and distress to patients (Rising et al., 2017). Research in Israel revealed that parents who accessed vaccine information on social media and internet platforms were more likely to be vaccine hesitant (Ashkenazi et al., 2020).

Given the concerns over the reliability of some information sources practice nurses in the empirical studies stated that they guided parents to evidence-based sources of information, such as NHS websites. Practice nurses reported that they felt it was important to signpost parents to credible sources of information due to the exposure of misinformation to parents on social media, where the public may struggle to assess quality information and where misinformation can be popular and persuasive (Steffens et al., 2017). A qualitative investigation in Australia examined how organisations who promote vaccination respond to social media (Steffens et al., 2019). In order to mitigate against misinformation, these organisations developed a range of strategies, including communicating with openness in an evidence-informed way; encouraging audience dialogue; fostering community partnerships; and countering misinformation with care (Steffens et al., 2019). Similarly, while parents in the Netherlands reported increasing use of social media for health related reasons, they additionally raised concerns about the reliability of data from these sources (Antheunis et al., 2013). Practice nurses in the empirical studies consistently reported the need to explain the Wakefield et al (1998) research findings. This related to the perceived misinterpretation of parents with regard to the findings (i.e. the association of a link between MMR and autism) with this confusion perpetuated on social media. Many of the practice nurses discussed how they addressed questions from parents concerning this research and provided reassurance to parents regarding the safety and efficacy of the MMR vaccine. Despite the passage of time since the retraction of the research in 2010, safety concerns about the MMR vaccine and the alleged link to autism continued to

persist during these practice nurses consultations with parents. In a survey of parents of incompletely immunised children in north west England, the most common reasons provided for not vaccinating their child with the MMR vaccine were safety concerns, autism, the role of the media and the Wakefield research (McHale et al., 2016). Therefore, it was considered essential for these practice nurses to be knowledgeable about the Wakefield et al research, explain the research findings and other contemporary research supporting the safety of the MMR vaccine. This illustrates the leading role that practice nurses play in advocating for, and promoting the uptake of the MMR vaccine.

A key issue for these practice nurses in providing information was perceived to be reassuring parents in order to offset the impact of publicly shared information that lacked credibility Trust in online health information has recently been of concern due to perceived shortcomings in individuals' ability to judge the quality of this information (Boyer, 2013; Anderson & Rainie, 2017). Notably what may be considered a trustworthy fact depends on each individual's life-experience, which in turn shapes their perspective to the prevailing societal values (Hautamäki, 2020).

A review of 47 health web sites on Covid-19 to access their readability and credibility revealed that the readability of COVID-19 information on websites is more complex than the recommended level and is generally aimed at high school graduates or college students (Khazaal et al., 2021). In this context, the recommended level of reading for health information should be for an 11 year old, as recommended by organisations such as the American Medical Association and National Institutes of Health (Cotunga et al., 2005). In relation to the UK web sites that practice nurses in the empirical studies may have recommended to their clients, two UK websites were cited in the Khazaal et al, review namely: GOV.UK and NHS websites. The readability levels for the two UK websites revealed different results, with the GOV.UK website being assessed as "fairly difficult to read" and the NHS web site as "fairly easy to read" (Khazaal et al., 2021: 79). Further research is necessary to evaluate the effectiveness of specific websites relating to immunisation information and importantly views from participants on how these could be improved.

Many of the populations that practice nurses served in the empirical studies included black, Asian and minority ethnic groups (BAME). Practice nurses reported that some BAME groups, especially the Somali population were reluctant to vaccinate their children with the MMR vaccine. Nurses in Sweden reported vaccine hesitancy among Somali parents, including lack of confidence in the MMR vaccine and loss of confidence in other vaccines due to mistrust of the MMR vaccine (Jama et al., 2019). However, not all BAME groups are MMR vaccine hesitant. A study in North West London found that there was a significantly higher coverage of the first MMR vaccine (recommended when an infant is 12 months of age) in the Asian group compared with Afro-Caribbean and Caucasian groups (Mixer et al., 2007). Similarly, results from child health records of childhood vaccination coverage by ethnicity within London between 2006/2007 and 2010/2011 revealed that the highest ethnic groups to receive their pre-school vaccines were from Indian, White British, Bangladeshi and Pakistani ethnic groups (Wagner et al., 2014). A systematic review which examined immunisation decision-making among BAME groups in the UK revealed that factors such as: upbringing, migration and language affected parents' perceived importance of immunisation, whether immunisations were permitted or culturally acceptable (Forster et al., 2016). In both the empirical studies, practice nurses were cognisant of factors that could affect immunisation decisions such as how different cultural characteristics influenced parental immunisation decision making. Further exploration on the role of ethnicity in vaccine decision-making is warranted.

Research has shown that religion shapes how people perceive science (Peifer et al., 2016; Scheitle & Ecklund, 2017). Findings in the USA from the Religious Understanding of Science survey revealed that religiosity does not alienate people from science information sources when they have a question about science, but it might make them seek religious information sources with the same question (Scheitle et al., 2018). The importance of religion was also reported in the findings from a Moroccan study of vaccine acceptability among pregnant women where their decision making was strongly influenced by family, community, mass media, religious leaders and health providers (Lohiniva et al., 2014). These results suggest that broad communication efforts should also be used to advocate for vaccination. In the context of the phase 3 empirical study, practice nurses reported how communication from

religious leaders influenced some parents' immunisation decision-making, especially when religious leaders were approached by health professionals to recommend parents to immunise their children with the MMR vaccine.

5.3 Optimising service provision

A key finding of the empirical studies was that practice nurses considered they included various strategies in their consultations to increase uptake of the MMR vaccine. This approach is supported in the literature: general practices with a clear strategy to reach a higher uptake of MMR (i.e. >90%) were found to increase uptake of the MMR vaccine (Lamden & Gemmell, 2008). Results from a sample of primary care providers, which included practice nurses in Australia revealed a number of strategies they used to engage with parents during their immunisation consultations (Berry et al., 2017). These strategies included: exploring and informing, establishing rapport and adopting a general principle to do no harm to the therapeutic relationship between practitioner and parent (Berry et al., 2017). The findings of the empirical studies demonstrated how practice nurses described incorporating strategies to address parental immunisation concerns such as safety and side effects about the MMR vaccine into their consultations with parents.

Practice nurses in the empirical studies described engaging with parents during their consultations to discuss vaccine related issues about the MMR vaccine, addressed questions, provided reassurance and treated parents in a non-judgmental way. In relation to the latter point, practice nurses reported the importance of respecting parents' decisions, even if parents declined the MMR vaccine for their children. The NMC Code provides guidance for all nurses, midwives and nursing associates in the UK to act in the best interests of people at all times and in order to achieve this they must:

"balance the need to act in the best interests of people at all times with the requirement to respect a person's right to accept or refuse treatment" (NMC, 2018: 7).

Further guidance in The Green Book, which has the latest information on vaccines and vaccination procedures in the UK provides direction for practitioners involved in the delivery of national immunisation programmes on upholding the best interests of a

child. The consent of one person with parental responsibility for a child is usually sufficient (Department of Health, 2021). However, if one parent agrees to immunisation but the other disagrees, the immunisation should not be completed unless both parents can agree to immunisation or there is a specific court approval that the immunisation is in the best interests of the child (Department of Health, 2021). This raises the question what is in the best interests of a child? It is argued when a parent states what they would wish for as the best outcome for a child, that two possible interpretations are distinguished namely: an expression of a parental right to determine what happens to the child and secondly an expression of a view about what is best for the child based upon “the special knowledge that a parent has for their own charges” (Archard & Skivenes, 2010: 49). However, Avery asserts that “what constitutes a child’s best interests is enormously subjective” (Avery, 2017: 224). In an emergency situation where doctors believe that parental decisions are not in the best interests of the child, it may be necessary to seek a view from the courts (British Medical Association, 2008). It has been suggested that in the ethics of vaccination, there are two major conflicts: one is between respect for autonomy and best interests of an individual, the other is between respect for autonomy and the public good (Rus & Groselj, 2021). Practice nurses in the empirical studies discussed how they dealt with both conflicts by respecting parents’ decisions not to immunise their children with the MMR vaccine, while at the same time promoting the importance of herd immunity. Juxtaposed with these conflicts is the dilemma that an increasing number of unvaccinated children will increase the likelihood of vaccine preventable diseases (i.e. by not meeting herd immunity levels) leading some writers to propose mandatory childhood vaccination policies (Pierik, 2020). A systematic review examined attitudes towards mandatory vaccination programmes principally in studies from Europe and North America and revealed that the majority of the populations surveyed seemed to be in favour of mandatory vaccinations (Gualano et al., 2019). It has been debated that mandatory vaccination should add to, not replace, other strategies to reach and sustain high rates of immunisation (Salmon et al., 2006). Concurrently, others have recommended that mandatory vaccination can only be justified as extreme solutions in cases of epidemics (Vetrugno et al., 2019). There has been debate on whether measles vaccination should be mandatory in the UK (Draeger et al., 2019). This debate has elicited differing viewpoints from legislating for mandatory vaccination to

ensure herd immunity levels to dealing with infrastructural issues that hinder MMR vaccine uptake rather than advocating for mandatory vaccination (Draeger et al., 2019). A number of the latter infrastructural issues explored related to whether each general practice has a dedicated lead for immunisation with an adequate call-recall system and immunisation session times to deal with parental immunisation issues (Draeger et al., 2019). Similarly, practice nurses in the empirical studies raised a number of infrastructural issues that impeded MMR vaccine uptake such as constraints of immunisation consultation appointment times. However, to mitigate against this, practice nurses stated that they offered solutions to increase MMR vaccine uptake such as: having flexible appointment times, reminding parents when their childrens' vaccines were scheduled and having a dedicated information stand at the general practice concerning not only the MMR vaccine, but all vaccines.

Parental responsibility is a legal concept that consists of the rights, duties, powers, responsibilities and authority that most parents have in respect of their children (British Medical Association, 2008). The sequential order that the MMR vaccine is recommended in the national immunisation programme is at 12 months of age (MMR1) and approximately at 4 years of age (MMR2). At each consultation, practice nurses in the empirical studies require consent to immunise from either a parent or those individuals with parental responsibility. Obtaining consent is an essential part of an immunisation consultation (Department of Health, 2021). The Green Book makes recommendations on the process of obtaining consent during an immunisation consultation, including that consent should must be sought on the occasion of each immunisation visit, be given voluntarily, the individual must be informed about the process, benefits and risks of immunisation and be able to communicate their decision. Information given should be relevant to the individual patient, properly explained and questions should be answered fully (Department of Health, 2021).

Practice nurses reported methods to engage and build trust with parents in the empirical studies mirror those of a qualitative longitudinal study in the USA (Dang et al., 2017). This study's findings revealed actions providers of health services can undertake to reduce patients' anxiety and build trust namely: provide reassurance, encourage patients to ask questions, act in a non-judgemental way and ask patients what they wanted from the consultation (Dang et al., 2017). The strategies reportedly

used by practice nurses in the empirical studies illustrated a similar in-depth level of engagement with parents to promote the uptake of the MMR vaccine.

Practice nurses who participated in the empirical studies viewed that alerting parents to local outbreaks of measles as an important strategy to influence parents MMR decision-making. The effectiveness of this strategy is supported by research which has shown an increase in MMR vaccine uptake during a measles outbreak (Le Menach et al., 2014). Measles outbreaks in gypsy, roma and traveller communities (i.e. travellers) are common, which a number of practice nurses in the empirical studies served in London (Ellis et al., 2020). Immunisation rates amongst travellers have been reported as low, with one study describing the risk of measles as 100 times higher than the general population (Maduma-Butshe & McCarthy, 2012). However, the UNITING study found that travellers were largely supportive of immunisations, especially those in younger generations (Mytton et al, 2020). The risk of sustained measles outbreaks, and therefore the long term consequences of measles such as permanent brain damage and hearing loss, remains in the UK due to children who have not received the required two dose MMR schedule as recommended in the national immunisation programme (Keenan et al., 2017). This is important since disease severity was one of the key attributes in vaccination decision-making for adults making a decision for themselves and for parents who decide for their children (Hoogink et al., 2020). It was considered important for practice nurses in the empirical studies to alert parents to local outbreaks of measles and possible long term consequences to ensure children were up to date with the two-dose schedule of the MMR vaccine.

The value of using strategies, either single or a combination thereof, to optimise vaccination uptake is recognised (Sondagar et al., 2020; Altinoluk-Davis et al., 2020). In a Cochrane review of 75 studies, single and combination reminders improved vaccination rates across all age groups, including for childhood immunisations, by an average of eight percent (Jacobson Vann et al., 2018). Research has shown that parental reminders such as the use of telephone calls (Alemi et al., 1996), postcards (Abramson et al., 1995), postcards followed by telephone reminders (Alto et al., 1994), postcards/telephone calls/home visits (Rodewald et al., 1999), continuous postcard reminders (Irigoyen et al., 2000), letters (Lieu et al., 1997) and postal reminders

including out of hours immunisation clinics (Yokley & Glenwick, 1984) led to a statistically significant increase in immunisation rates. Strategies to promote the MMR vaccine identified by practice nurses in the empirical studies included sending birthday card reminders, letters**,** texts, emails and phoning parents to make appointments with the practice nurse while maintaining a flexible approach to multiple appointments. Similar to the interventions described by practice nurses in the empirical studies, having flexible and diverse systems for booking appointments was an intervention recommended to promote immunisation uptake in traveller communities (Dyson et al, 2020). A key finding of the empirical studies was that practice nurses' felt they took into consideration organisational factors that they considered could facilitate uptake of the MMR vaccine. This is consistent with findings from other studies where strategies and approaches undertaken by all members of the primary health care team (e.g. health visitors, general practitioners) to increase vaccine uptake in the national immunisation programme have been identified. Interviews with UK health visitors revealed the emphasis they placed on communication strategies to promote vaccine uptake (Redsell et al., 2010). These strategies consisted of: providing information about the immunisation schedule, checking parental knowledge, repeating and reinforcing vaccine specific information, addressing fears, challenging misinformation and providing reassurance Redsell et al., 2010). Additional strategies included discussing herd immunity and raising awareness about the potential threats of disease especially focusing on disease outbreaks (Redsell et al., 2010). Similarly, practice nurses in the empirical studies reported discussing herd immunity with parents as well as alerting them to local outbreaks of infectious disease, particularly measles. However, what has not been explored are the strategies used by health professionals that are the most effective in promoting uptake of vaccines in national immunisation programmes – this represents an important recommendation for future research in this area.

Health visitors also reported disclosing their own immunisation behaviours as a strategy to increase vaccine uptake (Redsell et al., 2010). Paediatric providers have reported that they disclose vaccinating their own children, especially to vaccine hesitant parents and that they perceived that their vaccine self-disclosure was a strategy to promote parental immunisation decision making (Kempe et al., 2015). A secondary analysis of videotaped health supervision visits in the USA found that

provider vaccine self-disclosure occurred in 26% of visits leaving the authors to contend that clinical experience of self-disclosure to be beneficial in vaccine discussions with first time parents (Lepere et al., 2019). However, limitations of this study related to being conducted in a single geographical area, a small sample size that limited generalisability and that the results were unable to determine whether provider use of self-disclosure to support vaccination was associated with increased parental acceptance of vaccines (Lepere et al., 2019).

Research has identified variability in knowledge relating to vaccinations amongst health professional groups. In a recent cross-sectional survey of practice nurses, midwives and health visitors in England examining knowledge of vaccinations, results revealed differences amongst these professional groups, with 92% of practice nurses indicating they vaccinated pregnant women compared to 9% of midwives and 1% of health visitors (Vishram et al., 2018). The authors reported that practice nurses played a key role in administering vaccines and were more likely to have received vaccination training unlike health visitors who “were less likely to have received vaccination training” (Vishram et al., 2018: 183). Lack of vaccination training might impact on a health professional’s ability to devise strategies to promote vaccines in the national immunisation programme. Findings from the empirical studies revealed the importance that practice nurses placed on immunisation training and updates; all practice nurses reported attendance at annual immunisation updates to inform their clinical practice.

Research has examined strategies and interventions identified to increase immunisation uptake to specific populations. In this instance, findings from the third stage of the UNITING study (i.e. Cross-community synthesis stage) identified five interventions to increase immunisation uptake in the Gypsy, Roma and Traveller (GRT) communities (Dyson et al., 2020). These interventions consisted of cultural competence training for health professionals and frontline staff; identifying GRTs in health records to record immunisation uptake and tailor support; having a named frontline person in GP practice to provide respectful and supportive service; flexible and diverse systems for booking appointment, recall and reminders and protected funding for health visitor specialising in GRT health including immunisation (Dyson et al., 2020). The authors concluded that these interventions acknowledged the key role

of general practices, frontline workers and wider NHS systems on improving immunisation uptake and while the interventions were targeted to the GRT communities have broader applicability to other communities (Dyson et al., 2020).

Examination of whether financial incentives (FI) or quasi-mandatory schemes (QMS) are an acceptable intervention to immunisation uptake of MMR vaccination in pre-school children has also been undertaken (McNaughton et al., 2016). Participants in this UK study consisted of parents, health care professionals (i.e. practice nurses, health visitors and general practitioners) and policy makers. Results revealed that parents and health professionals felt introducing FI was inappropriate, while QMS was viewed as positive and less likely to create inequality. However, there were concerns about the implementation and workability of such schemes by parents and health professionals (McNaughton et al., 2016). The role of financial incentives was not raised by the PN participants in the empirical studies in this thesis. Rather practice nurses emphasised the importance of individualised care (e.g. providing evidence-based information; exploring parental health beliefs) and dealing with organisational factors (e.g. reminding parents when their childrens's vaccines were due as recommended in the national immunisation programme; lengthening consultation times with the practice nurse). There is evidence on the effectiveness of sending parents reminders as the key strategy to improve childhood immunisation uptake as explored in a systematic review of immunisation strategies (Williams et al., 2011). Reminders in the findings of this systematic review consisted of telephone calls, postcards and letters (Williams et al., 2011) which were very similar to the reminder strategies practice nurses reported in the empirical studies

Many practice nurses in the empirical studies reported how the constraints of appointment times, as determined by the general practice appointment time schedule hindered their immunisation consultations in practice. This necessitated practice nurses having to recommend parents to return for further appointments. Practice nurses reported that they encouraged multiple appointments for parents to enhance their ability to deal with, and address parental queries concerning vaccines. The provision of flexible appointments was a strategy used to increase uptake for cervical screening in Sweden particularly in women who had not attended for cervical screening in over nine years (Darlin et al., 2013). While practice nurses in the empirical

studies recommended parents make additional appointments with them, signposting individuals to avail of MMR immunisation appointments in general practice was found to be statistically less significant compared to a school nurse MMR immunisation service (Altinoluk-Davis et al., 2020). While practices nurses in the empirical studies stated that they supported the need for flexible appointments, with emphasis on the provision of additional appointments for parents, further research should explore from the parents' perspective what type of appointments relating to timing, frequency and duration would meet their needs.

Although the role of practice nurses' involvement in national immunisation programmes is well documented, uncovering the strategies used to ensure client centred practice represents an important new contribution to our understanding of their influence on the uptake of the MMR vaccine. While practice nurses in the empirical studies were not aware whether their general practices were meeting herd immunity levels, the clear strategies they recommended were focused on increasing uptake of the MMR vaccine. A key recommendation for future research would be to evaluate these strategies to ascertain their effectiveness.

5.4 Summary of the main findings

There were three distinct phases to the PhD. Phase 1 was an integrative review and sought to explore the beliefs and perceptions of practice nurses influence on the uptake of the MMR vaccine. Four themes were identified: parental immunisation influencing factors; practice nurse characteristics; information and communication and personal views and concerns. A key recommendation of the integrative review related to the importance of immunisation training and annual updates as essential for practice nurses to keep abreast with the evidence base underpinning national immunisation programmes. Phase 2 sought to explore practice nurses' perceptions of their immunisation role and strategies used to promote measles, mumps and rubella vaccine uptake in 2014 and 2018. Analysis of data for Phase 2 identified aspects of their role practice nurses perceived to be most influential including: promoting vaccination, assisting parents' to make informed decisions and provided insight into how they used specific strategies to achieve these in practice. These themes were consistent between the data collection points in 2014 and 2018. Finally, the Phase 3 study sought to determine how practice nurses engage with parents during their

consultations about the MMR vaccine. Three themes were derived from the data; engaging with parents, the informed practice nurse and dealing with parental concerns: strategies to promote MMR uptake. During their consultations, practice nurses reported encountering parents who held strong opinions about the MMR vaccine and perceived this to be related to the parents' socio-demographic background. Practice nurses reported seeking to provide parents with accurate sources of information to inform their immunisation decision-making about the MMR vaccine.

Findings from the empirical studies illustrate how practice nurses address parental concerns and the strategies they employ to provide individualised care and recommendations for organisational factors to promote MMR uptake. While these findings reveal the extent to which practice nurses assist parents in their immunisation decision-making, they were not designed to determine if they influence, or to what extent they influence, parental immunisation decision-making. Further research is required to determine this and is described in section 5.4.5 - Implications for further research.

5.4.1 Strengths

Findings of the integrative review informed the development of the Phase 2 and Phase 3 empirical studies.

Data in the Phase 2 study were collected at two time points. Therefore, findings may be more robust and reliable.

Data in the Phase 3 study were collected by a different researcher to address any potential bias, due to the involvement of the principal researcher.

The principal researcher maintained a reflective diary, which enabled her to consider the influence of her epistemological, ontological and philosophical stand points on data collection and analysis.

The principal researcher is experienced in the field of immunisaiton and this contributed to developing the interview questions for the empirical studies.

The empirical studies had a multifaceted approach in terms of exploring perceptions, strategies and engagement.

The empirical studies originality has helped contribute to current research by focusing on which aspects of their role practice nurses perceived to be most influential and, strategies they employed to promote the MMR vaccine as well as their perceptions about how they engage with parents during MMR consultations. All practice nurses approached to participate in the empirical studies agreed to participate showing a strong level of commitment to be part of research on an area where limited research existed previously.

5.4.2 Limitations

A number of limitations need to be considered whilst interpreting and using findings from the empirical studies in this thesis. When considering demographic data, participants were overwhelmingly female (n = 29/30). Twenty-eight participants were recruited from London and therefore, this may limit the findings due to the geographical considerations and potential influence on how practice nurses undertake immunisation practice in the capital city. To address this, further research is needed to determine whether similar results exist across wider geographical areas in the UK.

The empirical studies are further limited by a lack of a wider advisory group or patient and public involvement (PPI). This is recommended for future research. Guidance is now available for researchers how they can, and should include patients and public views into the design and conduct of research (Hoddinott et al., 2018). There is guidance available how to include PPI at all stages of research. These processes should be followed in future research applications (Hoddinott et al., 2018).

The original research ethics application included other stakeholders involved in the national immunisation programme (i.e. heath visitors, general practitioners and parents). The decision to focus on practice nurses was determined by the lack of research concerning their influence on the uptake of the MMR vaccine. This became apparent following the preliminary results of the integrative review. While the empirical studies have addressed a gap in the literature leading to new knowledge, further research needs to be undertaken to explore other stakeholders' perspectives about the role and influence of the practice nurse particularly focusing on the MMR vaccine.

Exploration of effective engagement strategies, especially through conversations with parents, are likely to be of benefit in future research.

While the aim of the Phase 3 study was to gain a greater understanding of how practice nurses engaged with parents, the results reveal the perceptions of practice nurses, rather than how they specifically engage with parents during consultations concerning the MMR vaccine.

5.4.3 Implications for practice

Although not explored in the empirical studies, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has affected all aspects of life, including routine immunisation coverage. Decreases in immunisation coverage have been reported in England due to the impact of coronavirus disease (Covid-19) (McDonald et al., 2020). Effective risk communication, along with strong endorsement from government will be important to achieve MMR vaccine confidence to increase uptake. The current decrease in MMR coverage has implications for practice nurses considering their key role in the delivery of national immunisation programmes and how they can facilitate uptake of the MMR vaccine. Therefore, the strategies identified by practice nurses in the empirical studies to enhance individualised care and changes to organisational factors may be even more important in promoting and increasing uptake of the MMR vaccine.

A key recommendation from the empirical studies is for practice nurses to enhance parents' understanding of the importance of achieving herd immunity: the benefits to their child and to public health in future consultations.

5.4.4 Implications for education

Findings from the empirical studies reveal the complexity of the practice nurse - parental immunisation consultation relating to concerns about MMR benefits, safety, side effects, parental sources of information and misinformation. Practice nurses in the empirical studies reported attendance at annual immunisation updates, as well as recourse to other sources of literature and research to inform their practice. Educational programmes and updates need to address how health professionals' deal with misinformation, especially from social media sites in future immunisation training.

Parents are not a homogenous group and education programmes should take into consideration how practitioners need to address cultural and health beliefs of diverse communities, particularly those from a BAME background during their consultations.

5.4.5 Implications for further research

The exploratory descriptive nature of these empirical studies provides a strong base to build on for future research as it lays the foundation for exploring the key contribution of practice nurses and the strategies they employ for the delivery and promotion of the MMR vaccine

While practices nurses in the empirical studies supported the need for flexible appointments, with emphasis on the provision of additional appointments for parents, it is important to explore from parents' perspectives what type of appointments relating to timing, frequency and duration would meet their immunisation needs.

Practice nurses used a variety of different methods (i.e. phoning parents, sending letters or texts) to remind parents when their children were scheduled to have vaccines. It is important to explore which of these methods is most effective in increasing MMR uptake.

While practice nurses recommended greater engagement with minority groups to increase uptake of the MMR vaccine, further research is needed to explore from the perspectives of minority groups what information and reassurance they need about vaccines.

Practice nurses recommended strategies to increase uptake of the MMR vaccine relating to individualised care and enhancing organisational factors, a key recommendation for future research is to evaluate these strategies to ascertain their effectiveness.

Practice nurses in the empirical studies used a variety of learning opportunities to access evidence-based immunisation information. However, there is little evidence in the empirical studies of the impact of the CPD practice nurses undertook on immunisation outcomes. Therefore, it would seem further evidence is needed

regarding which practice nurse CPD activities lead to improved outcomes in terms of MMR uptake.

The influence of practice nurses in national immunisation programmes needs to be explored considering how uniquely positioned practice nurses are to influence a parent's decisions to have their child immunised (Williams et al., 2011). While the findings of the empirical studies reveal the extent to which practice nurses provide information to parents to inform their immunisation decision-making, these empirical studies were not designed to determine if they influence, or to what extent they influence, parental immunisation decision-making. Further research should explore the views of parents as well as other professional groups involved in the delivery of the national immunisaiton programme to determine the extent to which practice nurses influence their immunisation decision-making.

5.5 Conclusion

The multifaceted role of practice nurses in health care provision in primary care has being increasingly recognised. Practice nurses are in a unique position to influence parents' decisions to have their child immunised due to their involvement in the delivery of national immunisation programmes. While there are a myriad of factors that can influence parental immunisation decision-making concerning the MMR vaccine, one of which includes health professionals, the literature to date has not examined practice nurses influence concerning the uptake of the MMR vaccine. The empirical studies explored how new evidence was established particularly in relation to how practice nurses perceive their immunisation role and the strategies they reported using to promote the uptake of the MMR vaccine. There were three phases to this body of work each with their own primary aim. Phase 1 findings identified four themes: parental immunisation influencing factors, practice nurse characteristics, information and communication, and personal views and concerns. While the integrative review provided an excellent baseline to ascertain the beliefs and perceptions of practice nurses influence about the uptake of the MMR vaccine, a limitation of the integrative review was the majority of the 12 articles were 10 years and older and therefore, may not reflect current practice nurses views and perceptions. The empirical studies were designed to address this gap in understanding practice nurse perceptions.

The findings of the Phase 2 study provide an understanding of practice nurses perceptions of the most important aspects of their immunisation role and the strategies they implemented in practice to promote the MMR vaccine. The strategies were wide ranging and included the provision of contemporary immunisation information to parents and dispelling myths and misconceptions concerning the MMR vaccine. In addition, during their consultations with parents, practice nurses sought to explore parental health beliefs, seeking to understand the parents' perspective and alerted parents to local outbreaks of infectious diseases, especially measles. By effecting these strategies, practice nurses sought to inform parents and assist their MMR immunisation decision-making.

Finally, the Phase 3 study sought to explore how practice nurses engage with parents about the MMR vaccine. During their consultations, practice nurses encountered parents who held strong opinions about the MMR vaccine and perceived this to be related to the parents' socio-demographic background. Practice nurses described providing parents with accurate sources of information to apprise their immunisation decision-making about the MMR vaccine. Furthermore, practice nurses described the need for a strong evidence base concerning the MMR vaccine. They considered this enabled them to address parental questions relating to the vaccine content and side effects. Practice nurses reassured parents who had safety concerns about the MMR vaccine and in so doing promoted the MMR vaccine.

In conclusion, the empirical studies have illustrated how practice nurses engage with parents and described the strategies they employ to promote uptake of the MMR vaccine. The findings of the empirical studies provide rich data from practice nurses' perspective to illustrate the ways in which they engage with parents to promote the uptake of the MMR vaccine. This illustrates the leading role that practice nurses play in advocating for, and promoting the uptake of the MMR vaccine

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Appendix 1- CASP qualitative check lists

CASP – Qualitative checklist -

Kennedy et al, 2013. Just that little bit of doubt': Scottish parents', teenage girls' and health professionals' views of the MMR, H1N1 and HPV vaccines

Question	Yes/Unclear/ No	Notes = 8/10 Scoring: Yes = 1 Unclear = 0.5 No = 0
Method		
Was there a clear statement of the aims of the research?	Yes.	The aim of the research was to explore parents', teenage girls' and health professionals' views about three vaccines in Scotland. These vaccines were: the MMR, the H1N1 and HPV vaccines.
Is a qualitative methodology appropriate?	Yes.	This methodology was appropriate as it enabled the researchers to gain a deeper understanding of the views of parents, teenage girls and health professionals concerning the 3 vaccines.
Was the research design appropriate to address the aims of the research?	Yes.	The use of qualitative semi structured interviews and focus groups enabled the researchers to develop an in-depth understanding of the research topic by offering a flexible approach to enable participant engagement.
Was the recruitment strategy appropriate to the aims of the research?	Unclear.	The researchers explained how the participants were recruited in Scotland and how they sought to recruit the 3 groups. While it clear how the health professionals and parents were recruited, it is not clear how the high schools were recruited. How were the schools approached? It is unknown if any participants, including schools declined to participate in the study.

Was the data collected in a way that addressed the research issue?	No.	The researchers do not identify the setting of where the interviews or focus groups were conducted. The researchers discussed their use of the methods, which was to explore vaccination views concerning 3 vaccines. There is no specific detail how the interviews were conducted or whether a topic guide was used. It is unknown if methods were modified during the study. It is not explicitly stated that the interviews and focus groups were tape recorded or what method was used to collect the data. While there is discussion on how the researchers analysed the data, this is brief and there is no confirmation that data saturation occurred.
Has the relationship between researcher and participants been adequately considered?	Yes.	All interviews and focus groups were conducted by the same researcher who outlined her role in the research process and importantly identified that she was not a health professional and therefore, unable to address questions concerning immunisation queries.
Have ethical issues been taken into consideration?	Yes.	The study was granted ethical approval from the university ethics committee, local health research and development offices and the education department. Although the researchers do not cite the REC date and identifying number in the article. The researchers sent information packs to the homes of the parents of interested teenage girls. Confidentiality was assured through the researchers using individual participant numbers to hide a participant's identity.

Was the data analysis sufficiently rigorous?	Yes.	Thematic analysis was used with one author (CGB) initially coding. Agreement on the final 2 codes was reached through consensus with the other members of the research team. Quotes from participants are interspersed in the results section to support the 2 themes namely: Vaccine risks revisited and Vaccine responsibilities. The interviewer (CGB) was the same researcher who undertook all interviews and focus groups. She was unknown to all participants and identified herself as a social science researcher interested in individuals' views about vaccination, but not a health professional. Therefore, from the onset, she made it explicit that she could not advise on immunisation matters.
Results		
Is there a clear statement of findings?	Yes.	The findings section is critically discussed. The researchers discuss their findings in relation to the original aim of this study. The researchers discuss that their findings cannot be generalised to other settings. They discuss the credibility of findings and how triangulation was ensured with the use of multiple viewpoints (i.e. from interviews and focus groups of 3 distinct groups).
How valuable is the research?	Unclear.	The research is a novel piece of research and provides insight into the perceptions and views of health professionals, parents and teenage girls about 3 vaccines. While the original study was undertaken over 2008/2010, it can be contended that the themes

		vaccine risks revisited and vaccine responsibilities would still be factors that would need further exploration to ascertain if these still influence immunisation decision making.

CASP – Qualitative checklist -

Van-Bekkum and Hilton, 2013a. The challenges of communicating research evidence in practice: perspectives from UK health visitors and practice nurses

Question	Yes/Unclear/ No	Notes = 9/10 Scoring: Yes = 1 Unclear = 0.5 No = 0
Method		
Was there a clear statement of the aims of the research?	Yes.	The aim of the research was to explore how primary care nurses negotiate the challenges of communicating health information and research in the United Kingdom.
Is a qualitative methodology appropriate?	Yes.	The use of semi structured telephone interviews was appropriate as it enabled the researchers to gain a deeper understanding of primary care nurses (e.g. practice nurses and health visitors) perspectives and experiences on they communicate research into their practice.
Was the research design appropriate to address the aims of the research?	Yes.	The cross sectional semi structured telephone interview was chosen as an appropriate data collection method, allowing for flexibility in the interview and enabling the researchers to develop an in-depth understanding of the research topic.
Was the recruitment strategy appropriate to the aims of the research?	Yes.	The researchers explained how the primary care nurses were recruited in the UK. They used a number of different ways to recruit, namely through the Community Practitioners and Health Visitors Annual Conference, adverts on the Royal College of Nursing website and through snowballing. The researchers justify their use of convenience sampling in order to obtain a diverse range of practitioners in terms of age:

		(32 – 63 years); length of experience in the health service: (2.5 – 36 years); type of caseload: (i.e. deprived city; high ethnic population, high alternative types population, affluent city; mixed city; mixed rural; deprived rural) and geographical location within the UK. Regarding the latter, participants' were recruited from 8 different regions across England and Scotland. The researchers articulated why they were selecting both practice nurses and health visitors as the sample group. It is unknown if any participants declined to participate in the study.
Was the data collected in a way that addressed the research issue?	Yes.	The researchers provided choice to the participants on where they wished the telephone interviews to be conducted (i.e. at their home or workplace) and that all interviews were tape recorded. In addition, the researchers justified their decision on using telephone interviews to consider how this method of data collection suited the busy schedules of these primary care nurses. The researchers provided detail on the average length of the telephone interviews and how this method provided flexibility to the interview process. There is no indication that methods were modified during the study. Although the researchers do not identify whether saturation of data occurred, they provide an account of how the themes were identified (i.e. using the constant comparative method and the 'in depth perception' exercise). Although, this

		is not an in-depth account of how the themes emerged. This was enabled by 2 of the researchers checking the research material to reach consensus.
Has the relationship between researcher and participants been adequately considered?	No.	This has not been considered or how this may have influenced the results of the health visitor and practice nurse participants.
Have ethical issues been taken into consideration?	Yes.	The study was granted ethical approval form the NHS National Research Ethics Committee (REC). Although the researchers do not cite the REC date and identifying number in the article. Anonymity was assured, as each participant was assigned an individual code, with the participants names removed from the transcripts.
Was the data analysis sufficiently rigorous?	Yes.	The researchers provide a summary of how from reading and re-reading the transcripts the process of analysis began to the final identification of the 3 themes and how the use of the constant comparative method and a depth perception exercise facilitated a more in depth critical analysis of the data. The researchers explore the strengths and limitations of the study. However, they do not examine how their own roles may have influenced the analysis and selection of data for presentation. Although the data was originally collected from 2008/2009, it can be contended that the identified 3 themes of: media influence on parents'; mass media influence on nurses'; and developing media literacy skills would still apply.
Results		

Is there a clear statement of findings?	Yes.	The findings section is critically discussed in depth. The researchers described how they reached consensus on how they identified the final 3 themes. The researchers discuss their findings in relation to the original aim of this study.
How valuable is the research?	Yes.	The research is a novel piece of research. A flaw in this publication is the length of time that has elapsed since the original telephone interviews (i.e. 2008/2009) to the time of publication (i.e. 2013). However, this research does question how health professionals need to engage with and interact with a strong evidence base to justify their practice and importantly how this is communicated with to clients.

CASP – Qualitative checklist -

Van-Bekkum and Hilton, 2013b. Primary care nurses' experiences of how the mass media influence frontline health care in the UK

Question	Yes/Unclear/ No	Notes =9 /10 Scoring: Yes = 1 Unclear = 0.5 No = 0
Method		
Was there a clear statement of the aims of the research?	Yes.	The aim of the research was clearly stated, which was to explore primary care nurses' experiences of how mass media influences their daily work.
Is a qualitative methodology appropriate?	Yes.	This methodology (i.e. in depth semi structured interviews) was appropriate as it enabled the researchers to gain a deeper understanding of primary care nurses (e.g. practice nurses and health visitors) perspectives and experiences on how the mass media influences front line healthcare.
Was the research design appropriate to address the aims of the research?	Yes.	The cross sectional interview study was chosen as an appropriate data collection method, allowing for flexibility in the interview and enabling the researchers to develop an in-depth understanding of the research topic.
Was the recruitment strategy appropriate to the aims of the research?	Yes.	The researchers explained how the primary care nurses were recruited in England and Scotland. They used a number of different ways to recruit, namely through the Community Practitioners and Health Visitors Annual Conferences, adverts on the Royal College of Nursing website and through snowballing. The researchers justified their use of convenience sampling in order to recruit a broad spread of participants in relation to the following

		characteristics: namely age; sex; length of experience in the health service; patient caseload characteristics and geographical location. The researchers articulated why they were selecting both practice nurses and health visitors as the sample group. It is unknown if any participants declined to participate in the study.
Was the data collected in a way that addressed the research issue?	Yes.	The researchers provided choice to the participants on where they wished the telephone interviews to be conducted (i.e. at their home or workplace) and that all interviews were tape recorded. The researchers provided detail on the average length of the telephone interviews and how this method provided flexibility to the interview process and how it gave practitioners a platform where they were "able to speak openly about the challenges they faced". There is no indication that methods were modified during the study. Although the researchers do not identify whether saturation of data occurred, they provide an account of how the themes were identified. Although, this is not an in-depth account of how the themes emerged. This was enabled by 2 of the researchers checking the research material to reach consensus.
Has the relationship between researcher and participants been adequately considered?	No.	This has not been considered or how this may have influenced the results.
Have ethical issues been taken into consideration?	Yes.	The study was granted ethical approval form the NHS National Research Ethics Committee (REC).

		Although the researchers do not cite the REC date and identifying number in the article. Informed consent was obtained by the researchers from each participant. Primary care nurses anonymity was ensured by using individual codes to hide the identity of each participant.
Was the data analysis sufficiently rigorous?	Yes.	The researchers identify how tentative themes were developed through the process of reading and re-reading each transcript. The use of NVivo 9 software then enabled them to use the principles of constant comparative analysis to refine the themes. Furthermore, 2 of the researchers (not identified in the article) collaborated to develop a greater critical analysis and understanding of participants accounts in their narratives by ask the "why" question about the content and discussing theoretical links to the data. The researchers as a result of this process made small changes (not identified in the article) to the themes. Three themes were identified from the data. There are quotes from both practice nurses and health visitors interspersed in the results section to support the 3 themes. The researchers explore the strengths and limitations of the study. However, they do not examine how their own roles may have influenced the analysis and selection of data for presentation.
Results		

Is there a clear statement of findings?	Yes.	The findings section is critically discussed. The researchers described how they reached consensus on how they identified the final themes. Further elaboration on how this occurred needed to be made more explicit. The researchers discuss their findings in relation to the original aim of this study.
How valuable is the research?	Yes.	The research is a novel piece of research. While the original data was collected between September 2008 and May 2009, it can be contended that the themes of: mass media influence on patients; mass medial influence on nurses and developing medial literacy skills would still be appropriate and applicable today.

Appendix 2 – Extract from reflexive diary dated 27 December 2018

My last supervisors meeting (LA and JC in attendance. DS on leave) occurred on Thursday 20 December. I discussed my progress to date; in particular, how I had completed the coding for the last two PN interviews (i.e. PN 5 and 6). All supervisors had received these coded interviews, including the draft category development for the six PN interviews prior to the December meeting. In preparation for the December supervisors meeting, I started reading about qualitative content analysis (QCA), as I was unfamiliar with this method. This was the method recommended at the November supervisors meeting to analyse my six PN interviews. I started reading a book by Schreier (2012) Quality Content Analysis in Practice to familiarise myself with QCA. The author provided a systematic account of QCA and I was struck by the amount of categories that could be developed (i.e. up to 40), which contrasted to my seven categories to date.

At the December supervisors meeting, LA discussed my coding and category development for the PN 5 and 6 interviews. In addition, she had annotated parts of both transcripts to highlight specific parts of the text and my discussion on the hard copy word documents. LA stated it was important to draw the codes directly from the interviews and not be influenced by my prior immunisation knowledge. I acknowledged that this was a factor I was becoming very aware of and certainly, I needed to keep in check. When I examined LA's comments on these two interviews after the supervisors meeting, I realised I had used my prior immunisation knowledge to cite Wakefield in my discussion section for PN 6. While PN 6 did not identify Wakefield in her interview, she stated: "*that the doctor who originally brought out the research against it, erm, and the findings he said he had, has been struck off".* I then referred directly to Wakefield in my discussion section. This is one example of how I need to be guided by the codes and careful in my discussion section as pointed out by LA and not making any assumptions. Again, in relation to the PN 6 interview, I made a note in the discussion section that I should have followed up questioning PN 6 about her comment: "*she* [other PN at the general practice] *does a great job on that*". I did not realise that I should have followed this up at the actual interview, but on listening to and reading the transcript, I noted that I should have. I have to acknowledge that I am going through a learning process with not only interviewing but also coding. I do get "annoyed" with myself, as I perceive I should know the process now. However, as pointed out by JC, I am going through a learning process. I need to be more patient with myself.

In relation to category development, it was useful during the December supervisors meeting when LA read out sections from the two PN transcripts (i.e. PN 5 and 6) and she questioned some of my draft category development. There was particular reference to one developing category – <u>Knowing the population</u>. I stated how this category was identified and related to how the PN described their practice population, particularly in terms of the ethnic make-up of their population. Although, as recommended by both supervisors, this category (if used) would need to demonstrate more in depth evidence of how the category was identified. As pointed out by LA and reference to the composition of the practice population would be relatively description and not illustrate specific traits of the population (i.e. how they thought about a specific aspect of immunisation for example). The latter would be expected for PhD level work.

Overall, I need to re think how I proceed. Time is a factor and I must be very careful how I use my time to recode and develop categories, starting from the initial PN interviews (i.e. PN 1 – 9, 2014). Fortunately, I can send my first PN 1 interview (2014), which I will code and begin to develop categories to my supervisors by no later than Monday 7 January. This will be very helpful to get their perspectives on this work to date. For me, I need to ensure that my codes and category development can be justified and defended. Therefore, to code correctly, I need to take my time. I realise I am very keen to complete work and this relates to my desire to complete the PhD. However, I must give time to code these interviews and have now set a target of one – two per week.

Appendix 3 – Phase 2: Patient information sheet

Study title

Practice nurse Influence on the uptake of the Measles, Mumps and Rubella (MMR) vaccine.

Invitation to the study.

You are invited to take part in a research study. Before you, make a decision as to whether it is something you would like to do, please take some time to read this information sheet to find out what it involves and ask any questions about the study.

This study aims to explore the role of the practice nurse in influencing uptake of the MMR vaccine.

Please feel free to ask any questions and clarify anything you do not understand, and take some time to decide as to whether you would like to take part.

The researcher who will be conducting this research study is Marie C. Hill, who is a Senior Lecturer (Practice Nursing) at City University London. Marie has been involved in the field of practice nursing since 1991 and has experience of working as a Practice nurse in East London. Marie's contact details are as follows and she would be happy to discuss any questions you may have.

Marie C. Hill.
Divisional Lead *Early Years* and Senior Lecturer in Practice Nursing,
School of Health Sciences,
City University London,
20 Bartholomew Close,
London, EC1A 7QN.
Tel No: 020 7040 5803 (Direct line).
Mobile: 077 033 58886.
Email: M.Hill-1@city.ac.uk

What is the purpose of the study?

A number of health professionals mainly practice nurses, health visitors and general practitioners administer many vaccines as part of the Childhood Immunisation Programme (from the age of 2 months - adolescence). It is important for childrens' health that immunisation uptake is as high as possible and that health care professionals are well equipped to offer good quality advice to parents. The purpose of this study is to seek your opinions and views about the role of the Practice nurse in influencing uptake of the MMR vaccine.

Why have you been chosen?

You have been approached by the researcher at City University, to participate in this study. The reason you have been selected in this study is because you are a practice nurse involved in either the administration or health promotion of the Childhood Immunisaiton Programme.

Do I have to take part?

No. This study is completely based on you volunteering your time and therefore, you decide if you want to take part. If you do, then a consent form will be signed seeking your agreement. However, you are free to withdraw from the study at any time with no explanation needed.

What will happen if you do take part in the study?

If you decide to take part then the following will take place:

1. You will be asked to sign a consent form.
2. The interview will be undertaken in a venue of your choice, with three options open to you in how you wish to be interviewed namely:

Face to Face interviews: These will be arranged at a time and venue of mutual convenience. Interviews will be tape-recorded with your consent. If you do not wish to be tape-recorded, then written notes will be taken by the interviewer. All interviews will be undertaken by the researcher - Marie C. Hill.

Interviews will last between 30 minutes and one hour. You can decline to answer specific questions during the course of the interview. Interview data will be transcribed verbatim and a copy of the transcript will be sent to you for verification by the interviewer.

Telephone Interviews: If you request a telephone interview, then the researcher will arrange a time that is mutually convenient to ring you. Telephone interviews will be tape-recorded with your consent. You can decline to answer specific questions during the course of the telephone interview. If you do not wish to be tape-recorded, then written notes will be taken by the interviewer. Interview data will be transcribed verbatim and a copy of the transcript will be sent to you for verification by the researcher.

Email: If you wish to respond by email, you will be sent a list of questions and a consent form. You will be asked to complete the consent form and return it by email. Receipt of the completed consent form by email from your personal email address will be taken

as the equivalent of a signature. You will be made aware of this. On receipt of emailed responses a follow up email will be sent thanking you for your contribution.

All email participants will be given a deadline to return their responses to the questions. Participants who do not respond within the deadline will be sent up to two further reminder emails.

What do I have to do?

Once you have read this information leaflet, take time to consider whether you wish to be involved in this study.

You may wish to contact the researcher directly to discuss further details.

If you are happy with the information leaflet and wish to participate, please contact the researcher directly within two weeks of receiving the invitation to participate in this study.

What are the disadvantages of taking part in the study?

There are no costs, risk of harm or significant disadvantages for taking part in this study. However, all it requires is your time, experience and verbal contribution in the interview.

What are the possible benefits in taking part?

The benefits of taking part in such a study include having a clearer understanding on the role of the practice nurse on influencing uptake of the MMR vaccine and how this role could be promoted to enhance vaccine uptake.

Will my taking part in this study be kept confidential?

Yes. Your interview will be transcribed by the researcher as part of her research. Your identity will not be made known in the written transcript or any other written format and you will be given a code. For example, if you are the first Practice nurse that is interviewed, you will be identified as “PN1”.

The tape recording and any notes of your interview will be in a locked press that is only known to the researcher. No other individual will have access to this information. Therefore, the information that you provide in the tape-recorded interview will be treated with the utmost respect and your confidentiality guaranteed by the researcher.

What happens to that information after the group study?

Your interview will be transcribed by the researcher. This written format of your interview will then be prepared for analysis by the researcher. The researcher will undertake at least 20 other interviews of practice nurses in London. The aim is to identify your views into themes, which will take into account the other practice nurse interviews.

A summary of the researcher's final report will be mailed to you by December 2014, when she will have completed this research.

Who is organising this research?

This study is being undertaken by the researcher as part of her doctorate in philosophy, which she is studying at City University London.

Who has reviewed the study?

Ethical approval to undertake the study - *Practice nurse influence on the uptake of the MMR vaccine* has been granted by the Proportionate Review Sum-committee of the National Research Ethics Service Committee South Central Berkshire on (14/11/2012).

Appendix 4 – Phase 2: Consent form

CONSENT FORM

Title of Project: **Practice Nurse influence on the uptake of the MMR vaccine**

Name of Researcher: **Marie C. Hill**

Please initial all boxes

1. I confirm that I have read and understand the information sheet dated 04/09/2012 (version 1) for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily. ☐

2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, without my medical care or legal rights being affected. ☐

3. I agree to take part in the above study. ☐

4. I agree to be tape recorded for the above study. ☐

5. I understand that no information obtained as part of my interview will identify me and that my personal details (e.g. my name) will be anonymised in the transcript of the interview and any documentation relating to the interview. ☐

6. I acknowledge that I will receive a summary of the study on its completion. ☐

Name of Participant	Date	Signature

Name of Person taking consent.	Date	Signature

Version 4 – 02/11/2012.

Appendix 5 – Phase 2: List of questions used in the 2014 and 2018 practice nurse interviews

i). Can you describe your role in the Childhood Immunisation Programme?

ii). How often do you have training on immunisation, particularly in relation to the Childhood Immunisation Programme?

iii). Can you explain what you consider to be the barriers to the uptake of the MMR vaccine?

iv). What do you consider would promote the uptake of the MMR vaccine?

v). When you are with a parent discussing immunisation issues and/or concerns, what decision-making models do you use to assist you in these consultations?

vi). How many times a week would parents consult you for immunisation advice? Can you give me an example of one of your last consultations?

vii). Who would you consider is the health professional that can best advise parents on immunisation issues?

viii). How can you influence the uptake of the MMR vaccine?

Appendix 6 – PN 3, 2018 coding template examples

Transcript extracts from PN 3 (2018) interview	Codes	Sub categories	Categories	Themes
PN 3:I tell them that the research was, erm,… debunked completely; that the, erm, that the doctor who wrote it was struck off. Erm,… I tell them that he's a friend of Trump, 'cos that sometimes helps laughs],…	Research debunked Doctor struck off In vivo code "*I tell them that he's a friend of Trump, 'cos that sometimes helps*"	Exploring the literature and evidence	Aspects of the practice nurse consultation	**Promoting vaccination**
PN 3: Erm… I would say that… erm, yeah [half laugh]. So I think the, the Bengalis are very accepting, certainly, of, of those, erm, you know, the one-year imms, erm, and don't tend to-, they're more concerned about whether it's got gelatine in it or not, rather than, you know, whether it's-, they don't seem as conne-, you know, as concerned about, erm, any link with, erm, autism. Erm,… where… people…- So it's people who…, and I don't know their, erm, kind of economic background [half laugh], and we don't know what their, er, circumstances are, so…-, but it tends to be… erm, not the majority population. It would be more kind of European or African populations that would question it, and then… I would… [pause]- I haven't had many that have required an in-, a more in-depth… explanation of it… recently	Bengalis accepting Concerned about gelatine Not concerned about a link to Autism In vivo code "It would be more kind of European or African populations that would question it" No recent in depth explanations	Migrant perceptions Migrant perceptions	Socio demographics Socio demographics	**Assisting parents to make informed decisions** **Assisting parents to make informed decisions**

PN 3: I find-, I say to them, erm, they're gonna have-, this-, they're scheduled to have four vaccines. By the end of it the child is quite distressed, by the end of the fourth one. It's-, I find it quite unpleasant to do. Erm,… so… if… when I say there are four vaccines to be given, and the parent goes, 'Four [shocked]?' I say, 'If you want, we can give two today, and I can rebook you for next week, and we can do two next week,' something like that, and see how they respond to that. I think it <u>is</u> a lot of vaccines, and the child is super distressed, often, by the end of it, and I think it's-, yeah, it hurts [unsurprisingly]. **[0:23:57]**.	Four vaccines Distressed child In vivo code: "*I find it quite unpleasant to do*." Four injections Two today Rebook Next week Awaiting a response A lot of vaccines In vivo code "*and the child is super distressed* Hurting	Concerns about the number of vaccines Commun-ication and Information Giving	*Parental concerns and barriers to MMR uptake* *Aspects of the practice nurse consultation*	**Assisting parents to make informed decisions** **Promoting vaccination**
So, erm, when I do that, and they say, 'Yes, I'll have two today and two next week,' then I always give the MMR first [half laugh], and, erm, and Mentorix **[0:24:09]**.	Agreeing MMR first	Promoting MMR	*Strategies to promote and improve MMR uptake*	**Strategies and factors that promote the uptake of the MMR vaccine**

Appendix 7 – Phase 3: Patient Information sheet

Study title

Practice Nurse Influence on the uptake of the Measles, Mumps and Rubella vaccine.

Name of Principal Investigator

The name of the Principal Investigator is Marie Hill. The supervisors of the Principal Investigator are Professor Leanne Aitken, Professor Debra Salmon and Dr. Jane Chudleigh.

Invitation to the study.

We would like to invite you to take part in a research study, which is part of the Principal Investigator's research for her Doctorate in Philosophy at City, University of London.

As the Principal Investigator is well known as an expert lecturer in the field of immunisation, the interviews will be undertaken by a research assistant (i.e. Dr. Gabriella Romano), who has expertise in conducting interviews.

Before you decide whether you would like to take part, it is important that you understand why the research is being done and what it would involve for you. Please take time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or if you would like further information.

What is the purpose of the study?

A number of health professionals mainly practice nurses, health visitors and general practitioners administer vaccines that are part of the national immunisation programme in the United Kingdom. It is important for childrens' health that immunisation uptake is as high as possible and that health care professionals involved are well equipped to offer good quality advice to parents. The purpose of this study is to seek your opinions and views about the role of the practice nurse concerning MMR vaccination. The questions asked in the interview by the research assistant will examine factors that influence your role in MMR vaccination, the strategies you use in your consultations with parents, the information that guides these consultations and what your education needs are concerning the MMR vaccine.

City, University of London is the sponsor for this study based in England. We will be using information from you in order to undertake this study and will act as the data controller for this study. This means we are responsible for looking after your information and using it properly. City, University of London will keep identifiable information about you for 10 years after the study has finished until 2030. Your rights to access, change or move your information are limited, as we need to manage your information in specific ways in order for the research to be reliable and accurate. If you withdraw from the study, we will keep the information about you that we have already obtained. To safeguard your rights, we will use the minimum personally-identifiable information possible.

City, University of London is the data controller for the personal data collected for this research project. If you have any data protection concerns about this research project, please contact City's Information Compliance Team at dataprotection@city.ac.uk

The research assistant will use your name and contact details (i.e. your email and/or telephone details) to contact you to arrange your interview at a time and date of your convenience. The research assistant will ensure that relevant information about the study is recorded for your care, and to oversee the quality of the study.

The Principal Investigators' supervisors (i.e. Professor Leanne Aitken, Professor Debra Salmon and Dr. Jane Chudleigh) may look at your research records to check the accuracy of the research study. The only person in City, University of London who will have access to information that identifies you and who needs to contact you (i.e. to send you a complete transcript of your audio recorded interview) or audit the data collection process will be the research assistant who undertakes your interview. No other individual will be able to identify you and find out your name.

At the end of your interview, the following demographic and practice characteristics will be collected (i.e. racial or ethnic origin, gender, qualifications, continuing professional and personal development in relation to immunisation, length of time working as a nurse, length of time working as a practice nurse and whether in full or part time employment).

Why have I been invited?

You have been approached to participate in this study because you are a practice nurse involved in the administration of the national immunisation programme

Do I have to take part?

It is up to you to decide whether or not to take part. If you do decide to take part you will be asked to sign a consent form. If you decide to take part you are still free to withdraw at any time and without giving a reason.

What will happen if you do take part in the study?

You will be interviewed once at a venue and location of your choice. If you wish, the interview can be conducted via telephone. The face to face audio recorded interview or the telephone interview will last between 40 minutes to 1 hour. You will be asked a number of questions. You can decline to answer specific questions during the course of the interview. Interview data will be transcribed in full and a copy of the transcript will be sent for you to check the accuracy of the data by the interviewer.

What do I have to do?

Once you have read this participant information sheet, take time to consider whether you wish to be involved in this study.

You may wish to contact the research assistant directly to discuss further details. If you are happy with this information and wish to participate.

What are the possible disadvantages and risks of taking part?

There are no costs, risk of harm or significant disadvantages for taking part in this study. However, all it requires is your time, experience and verbal contribution in the interview.

What are the possible benefits of taking part?

The benefits of taking part in such a study include having a clearer understanding of the practice nurse's role concerning MMR vaccination and how this role could be promoted to enhance vaccine uptake. This study will help build new knowledge for practice nurses about their role in MMR vaccination.

What will happen when the research study stops?

The Principal Investigator will complete the writing up of her dissertation for her Doctorate in Philosophy. During which time, she will publish her research in an academic journal.

Will my taking part in the study be kept confidential?

Your interview will be transcribed in full. The information collected from your interview will not identify you and will not be combined with other information in a way that could identify you. The information will only be used for the purpose of health and care research, and cannot be used to contact you or to affect your care. It will not be used to make decisions about future services available to you.

Your identity will not be made known in the written transcript or any other written format, such as a publication and you will be given a code. For example, if you are the first practice nurse that is interviewed, you will be identified as "PN1".

The audio recording and any notes of your interview will be in a locked press for a maximum period of 10 years. No other individual, including the Principal Investigators supervisors will have access to this information.

Therefore, the information that you provide in the audio-recorded interview will be treated with the utmost respect and your confidentiality guaranteed.

What should I do if I want to take part?

You can contact Dr. Gabriella Romano, whose contact details are as follows:

Dr. Gabriella Romano
Research Assistant
City, University of London
Northampton Square
London, EC1V 0HB.
Email address: Gabriella.Romano@city.ac.uk

What will happen to results of the research study?
The results of the research study will form part of the Principal Investigator's final dissertation for her Doctorate in Philosophy. As well as this dissertation, there will be at least one publication arising from the research study. Anonymity of all participants will be maintained throughout. All participants will automatically receive a copy of the publication from the Principal Investigator.

Who has reviewed the study?

Ethical approval was granted by the Proportionate Review Sub-committee of the National Research Ethics Service Committee South Central Berkshire on 14 November 2012.

Thank you for taking the time to read this information sheet.

15 November 2018
Version 3 in line with GDPR guidance 25 May 2018

Appendix 8 - Phase 3: Consent Form

Title of Study: Practice Nurse Influence on the uptake of the Measles, Mumps and Rubella vaccine.

Please initial box

1	I confirm that I have had the project explained to me, and I have read the participant information sheet, which I may keep for my records.	
	I understand this will involve	
	• be interviewed by the researcher	
	• allow the interview to be audio recorded	
2	This information will be held by City as data controller and processed for the following purposes: Public Task: The legal basis for processing your personal data will be that this research is a task in the public interest, that is City, University of London considers the lawful basis for processing personal data to fall under Article 6(1)(e) of GDPR (public task) as the processing of research participant data is necessary for learning and teaching purposes and all research with human participants by staff and students has to be scrutinised and approved by one of City's Research Ethics Committees. I understand that the following special category data will be collected and retained as part of this research study: (i.e. racial or ethnic origin, gender, qualifications, continuing professional and personal development in relation to immunisation, length of time working as a nurse, length of time working as a practice nurse and whether in full or part time employment). City considers the processing of special category personal data will fall under: Article 9(2)(g) of the GDPR as the processing of special category data has to be for the public interest in order to receive research ethics approval and occurs on the basis of law that is, inter alia, proportionate to the aim pursued and protects the rights of data subjects and also under Article 9(2)(a) of the GDPR as the provision of these personal data is completely voluntary.	
3	I understand that any information I provide is confidential, and that no information that could lead to the identification of any individual will be disclosed in any reports on the project, or to any other party. No identifiable personal data will be published. The identifiable data will not be shared with any other organisation.	

4	I understand that my participation is voluntary, that I can choose not to participate in part or all of the project, and that I can withdraw at any stage of the project without being penalised or disadvantaged in any way.	
5	I agree to City recording and processing this information about me. I understand that this information will be used only for the purpose(s) set out in this statement and my consent is conditional on City complying with its duties and obligations under the General Data Protection Regulation (GDPR).	
6.	I agree to the arrangements for data storage, archiving, sharing.	
7	I agree to the use of anonymised quotes in publication.	
8	I agree to take part in the above study.	

_____	_____	_____
Name of Participant	Signature	Date

Email address:

Phone No:

_____	_____	_____
Name of Researcher	Signature	Date

When completed, 1 copy for participant; 1 copy for researcher file.

Version 2 - 03/08/2018 in line with GDPR guidance 25/05/2018.

Appendix 9 – Phase 3: List of questions used in the 2019 practice nurse interviews

Research objectives:

- To examine factors that influence practice nurses' role in MMR vaccination
- To determine what strategies and initiatives practice nurses use to inform their consultations with parents concerning the MMR vaccine
- To explore the information practice nurses use to inform their consultations in relation to the MMR vaccine
- To identify from the perspective of practice nurses their education needs connected to the MMR vaccine.

Questions:

- Can you tell me about a typical working week as a practice nurse?
- Can you tell me about the size and population of your general practice?
- What are the challenges in your practice area relating to immunisation?
- How do you communicate to parents concerning the MMR vaccine?
- What are the challenges facing your consultations in relation to the MMR vaccine?
- When a parent attends for the MMR vaccine, tell me what you would say to them?
- How do you deal with parents who are uncertain about vaccinating with the MMR vaccine?
- How informed are parents before coming to see you concerning the MMR vaccine?
- Where do parents get their information concerning the MMR vaccine?
- Where do you recommend parents to get information?
- How do you keep up to date with changes to the national immunisation programme, particularly the MMR vaccine?
  [If the practice nurse states that they have difficulty in keeping up to date, then ask them a probing question.
  "Can you tell me why you have difficulties' in keeping up to date? (i.e. paraphrase what they have said)]
- What specific information do you need about the MMR vaccine when either attending immunisation updates or accessing online information?
- Has the process and requirements around revalidation influenced these opportunities?
- What is your general practice's uptake for MMR at 12 months and at school age?

<u>At the end of the interview, elicit the special category data</u>

- How would you describe your own racial or ethnic origin?
- Can you describe your gender?
- What are your formal qualifications?
- In relation to your continuing professional and personal development and immunisation, can you discuss what this is to date?
- Can you tell me how long you have been working as a Registered Nurse?
- Can you tell me how long you have been working as a Registered Nurse and then as a Practice Nurse?

- Are you working as a Practice Nurse on a full or part time capacity and how many hours per week?

Appendix 10 – PN 2019 coding template examples

PN 10 (2019) TEXT	CODE	CATEGORY	THEME
We also have a television screen in all our waiting rooms where we put up quite a lot of information about measles, mumps and rubella vaccination, trying to discount the myths about it, erm, and, you know, really encouraging people to come forward	Sources of information	Practice nurses role and perceptions	*Engaging with parents*
and to counter some of the arguments that are coming through from social media, because there's so much, and the parents are just frightened and just won't discuss it, and say, 'No! No!	Sources of information	Practice nurses role and perceptions	*Engaging with parents*
again, about autism and about Andrew Wakefield's research. Er, that still keeps coming back, even though it's been disputed and, and thrown out. And it, it doesn't seem to matter how often we say, 'The Autism Society actually recommends that you have it. There's no proof,'… it's still coming through, even after all these years.	Dealing with Wakefield	Influencing factors affecting immunisation uptake	*Dealing with parental concerns: strategies to promote MMR uptake*
we've tried to reassure them [parents] that, you know, that's quite rare	**Providing reassurance**	**Practice nurses role and perceptions**	***Engaging with parents***
Well, in actual fact, in a small group of children it can cause very nasty complications and, in the future,' and that's why we	**Promoting immunisation**	**The national immunisation programme**	***The informed practice nurse***

give the measles, mumps and rubella together			
… you know, that, in actual fact, the risk of not having it, especially-, I think…it's been easier of recently because we have had an outbreak of, measles and mumps in this area	**Disease outbreaks**	**Influencing factors affecting immunisation uptake**	***Dealing with parental concerns: strategies to promote MMR uptake***
and we, we can actually say, 'Look, these diseases are coming back	**Disease outbreaks**	**Influencing factors affecting immunisation uptake**	***Dealing with parental concerns: strategies to promote MMR uptake***
It's only because we're getting a good coverage, good herd immunity that, that will actually protect	**Herd immunity**	**The national immunisation programme**	***The informed practice nurse***
and also I say, 'We're also protecting the more vulnerable children; the ones who can't have it for whatever medical condition that they may have	**Herd immunity**	**That national immunisation programme**	***The informed practice nurse***
I try not to be… too… judgemental, because, at the end of the day, it is their decision	**Respecting**	**Practice nurses role and perceptions**	***Engaging with parents***
if they really don't want to have their children vaccinated, then I've got to do everything I can do to protect that child by sort of explaining things to the parents	**Communicating and information giving**	**Practice nurses role and perceptions**	***Engaging with parents***

I will send them [parents] to NHS Choices,…to the immunisation page on there. I will print off the leaflet from Public Health England… and I will advise them to chat to the health visitor.	**Sources of information**	**Practice nurses roles and perceptions**	***Engaging with parents***
I think for, for MMR vaccination, we are doing quite a big campaign here to try and get the adults vaccinated,… To make sure that they've had two doses of MMR.	**Strategies to promote and improve uptake of the MMR vaccine**	**Strategies to promote MMR uptake**	***Dealing with parental concerns: strategies to promote MMR uptake***
some of it is travel – people are going abroad and …the girls are very good at travel immunisations in the surgery and they say, 'Well, you need to have your two doses of measles, mumps and rubella because Italy has had an outbreak	**Following up**	**Strategies to promote MMR uptake**	***Dealing with parental concerns: strategies to promote MMR uptake***

Appendix 11 – Ethical approval from the Proportionate Review Sub-committee of the NRES Committee South Central Berkshire granted on (14/11/2012; REC reference number: 12/SC/0653).

NHS
Health Research Authority

NRES Committee South Central - Berkshire

Bristol REC Centre

Whitefriars

Level 3, Block B

Lewins Mead

Bristol

BS1 2NT

Telephone: 0117 3421389

Facsimile: 0117 3420445

14 November 2012

Mrs Marie Hill
Divisional Lead Early Years
City University London
School of Health Sciences
City University London
20 Bartholomew Close, London
E16 2SD

Dear Mrs Hill,

Study title: **Practice Nurse influence on the uptake of the Measles, Mumps and Rubella (MMR) vaccine.**
REC reference: **12/SC/0653**

The Proportionate Review Sub-committee of the NRES Committee South Central - Berkshire reviewed the above application on 01 November 2012.

Ethical opinion

On behalf of the Committee, the sub-committee gave a favourable ethical opinion of the above research on the basis described in the application form, protocol and supporting documentation, subject to the conditions specified below.

Ethical review of research sites

The favourable opinion applies to all NHS sites taking part in the study, subject to management permission being obtained from the NHS/HSC R&D office prior to the start of

the study (see “Conditions of the favourable opinion” below).

Conditions of the favourable opinion

The favourable opinion is subject to the following conditions being met prior to the start of the study:

1. Please add a clause to the consent form seeking explicit consent for audio-recording.

Management permission or approval must be obtained from each host organisation prior to the start of the study at the site concerned.

Management permission (“R&D approval”) should be sought from all NHS organisations involved in the study in accordance with NHS research governance arrangements.

Guidance on applying for NHS permission for research is available in the Integrated Research Application System or at http://www.rdforum.nhs.uk.

Where a NHS organisation's role in the study is limited to identifying and referring potential participants to research sites ("participant identification centre"), guidance should be sought from the R&D office on the information it requires to give permission for this activity.

For non-NHS sites, site management permission should be obtained in accordance with the procedures of the relevant host organisation.

Sponsors are not required to notify the Committee of approvals from host organisations.

It is the responsibility of the sponsor to ensure that all the conditions are complied with before the start of the study or its initiation at a particular site (as applicable).

You should notify the REC in writing once all conditions have been met (except for site approvals from host organisations) and provide copies of any revised documentation with updated version numbers.

Confirmation should also be provided to host organisations together with relevant documentation.

Approved documents

The documents reviewed and approved were:

Document	*Version*	*Date*
Interview Schedules/Topic Guides	Questions for Parents (Immunised): Version 1.0	27 October 2012
Interview Schedules/Topic Guides	Questions for Health Visitors: Version 1.0	27 October 2012
Interview Schedules/Topic Guides	Questions for Parents (Not immunised): Version 1	27 October 2012
Interview Schedules/Topic Guides	Questions for General Practitioners: Version 1	27 October 2012
Investigator CV	Mrs Hill	
Investigator CV	Carol Lynn Cox	
Investigator CV	Victoria L. Joffe	
Letter of invitation to participant	Practise Nurses: Version 4.0	02 November 2012
Letter of invitation to participant	Health Visitors: Version 4.0	02 November 2012
Letter of invitation to participant	Parents: Version 4.0	02 November 2012
Letter of invitation to participant	General Practitioners: Version 4.0	02 November 2012
Participant Consent Form: Parents	4.0	01 November 2012
Participant Consent Form: Practise Nurses	4.0	01 November 2012
Participant Consent Form: General Practitioners	4.0	01 November 2012

Participant Consent Form: Health Visitors	4.0	01 November 2012
Participant Information Sheet: Practise Nurses	1.0	04 September 2012
Participant Information Sheet: Health Visitors	1.0	04 September 2012
Participant Information Sheet: Parents	1.0	04 September 2012
Participant Information Sheet: General Practitioners	1.0	04 September 2012
Protocol	2.0	01 November 2012
REC application		01 November 2012

Membership of the Proportionate Review Sub-Committee

The members of the Sub-Committee who took part in the review are listed on the attached sheet.

Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

After ethical review

Reporting requirements

The attached document "After ethical review – guidance for researchers" gives detailed guidance on reporting requirements for studies with a favourable opinion, including:

- Notifying substantial amendments
- Adding new sites and investigators
- Notification of serious breaches of the protocol
- Progress and safety reports
- Notifying the end of the study

The NRES website also provides guidance on these topics, which is updated in the light of changes in reporting requirements or procedures.

Feedback

You are invited to give your view of the service that you have received from the National Research Ethics Service and the application procedure. If you wish to make your views known please use the feedback form available on the website.

Further information is available at National Research Ethics Service website > After Review

12/SC/0653	**Please quote this number on all correspondence**

With the Committee's best wishes for the success of this project

Yours sincerely

[redacted]

Chair

Email: nrescommittee.southcentral-berkshire@nhs.net

Enclosures: *List of names and professions of members who took part in the review*

After ethical review – guidance for researchers

Copy to: [redacted]

NRES Committee South Central - Berkshire

Attendance at PRS Sub-Committee of the REC meeting on 01 November 2012 Committee

Members:

Name	*Profession*	*Present*	*Notes*
[redacted]	Social Scientist	Yes	
	Director	Yes	
	Co-ordinator for QA in Research	Yes	

Appendix 12 – Favourable result for REC reference: 12/SC/0653, Amendment number 1 (05/06/2017). IRAS project ID: 106636.

NHS
Health Research Authority

South Central - Berkshire Research Ethics Committee

Bristol REC Centre

Whitefriars
Level 3, Block B
Lewins Mead

Bristol
BS1 2NT

17 August 2017

Mrs Marie Hill
Senior Lecturer
City, University of London
School of Health Sciences
City, University of London
London
EC1V 0HB

Dear Mrs Hill

Study title:	**Practice Nurse influence on the uptake of the Measles, Mumps and Rubella (MMR) vaccine.**
REC reference:	**12/SC/0653**
Amendment number:	**1**
Amendment date:	**05 June 2017**
IRAS project ID:	**106636**

The above amendment was reviewed the Sub-Committee in correspondence.

Ethical opinion

The members of the Committee taking part in the review gave a favourable ethical opinion of the amendment on the basis described in the notice of amendment form and supporting documentation.

Approved documents

The documents reviewed and approved at the meeting were:

Document	*Version*	*Date*
Notice of Substantial Amendment (non-CTIMP) [AmendmentForm_ReadyForSubmission.pdf]	1	05 June 2017
Other [CV_LAitken_May2017_short.docx]		01 May 2017
Other [Prof Debra Salmon - CV.pdf]		
Other [REC_IRAS Form_16082017-1.pdf]		15 August 2017

Membership of the Committee

The members of the Committee who took part in the review are listed on the attached sheet.

Working with NHS Care Organisations

Sponsors should ensure that they notify the R&D office for the relevant NHS care organisation of this amendment in line with the terms detailed in the categorisation email issued by the lead nation for the study.

Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

We are pleased to welcome researchers and R & D staff at our Research Ethics Committee members' training days – see details at http://www.hra.nhs.uk/hra-training/

12/SC/0653:	**Please quote this number on all correspondence**

Yours sincerely

[redacted]

pp

[redacted]

E-mail: nrescommittee.southcentral-berkshire@nhs.net

Enclosures: *List of names and professions of members who took part in the review*

Copy to: [redacted]

South Central - Berkshire Research Ethics Committee Attendance at Sub-Committee of the REC held in correspondence

Committee Members:

Name	*Profession*	*Present*	*Notes*
[redacted]	Social Scientist	Yes	
[redacted]	Coordinator for QA in Research	Yes	

Also in attendance:

Name	*Position (or reason for attending)*
[redacted]	REC assistant

Appendix 13 - Notification of Non-Substantial/Minor Amendments(s) for NHS Studies' (Dated 19 and 20 March 2019 respectively) and 'Favourable result for REC reference: 12/SC/0653, NSA 2 - changes to CI research team, minor changes to study documents and extension of study end date until 31st Dec 2019 (Email received 02 April 2019 10:37hrs).

Notification of Non-Substantial/Minor Amendments(s) for NHS Studies

This template **must only** be used to notify NHS/HSC R&D office(s) of amendments, which are **NOT** categorised as Substantial Amendments.
If you need to notify a Substantial Amendment to your study then you MUST use the appropriate Substantial Amendment form in IRAS.

Instructions for using this template

- For guidance on amendments refer to http://www.hra.nhs.uk/research-community/during-your-research-project/amendments/
- This template should be completed by the CI and optionally authorised by Sponsor, if required by sponsor guidelines.
- This form should be submitted according to the instructions provided for NHS/HSC R&D at http://www.hra.nhs.uk/research-community/during-your-research-project/amendments/which-review-bodies-need-to-approve-or-be-notified-of-which-types-of-amendments/ . If you do not submit your notification in accordance with these instructions then processing of your submission may be significantly delayed.

1. Study Information

Full title of study:	Practice Nurse influence on the uptake of the Measles, Mumps and Rubella (MMR) vaccine.
IRAS Project ID:	106636
Sponsor Amendment Notification number:	REC reference: 12/SC/0653. 14 November 2012.
Sponsor Amendment Notification date:	28 February 2019
Details of Chief Investigator:	
Name [first name and surname]	Marie C Hill
Address:	City, University of London Northampton Square London
Postcode:	EC1V 0HB
Contact telephone number:	(0)20 7040 5803

Email address:	M.Hill-1@city.ac.uk
Details of Lead Sponsor:	
Name:	Professor Chris Hull
Contact email address:	C.C.Hull@city.ac.uk
Details of Lead Nation:	
Name of lead nation	England
If England led is the study going through CSP?	No
Name of lead R&D office:	Barts Health NHS Trust

This template **must only** be used to notify NHS/HSC R&D office(s) of amendments, which are **NOT** categorised as Substantial Amendments.
If you need to notify a Substantial Amendment to your study then you MUST use the appropriate Substantial Amendment form in IRAS.

No.	**Brief description of amendment** *(please enter each separate amendment in a new row)*	**Amendment applies to** *(delete/ list as appropriate)*		**List relevant supporting document(s), including version numbers** *(please ensure all referenced supporting documents are submitted with this form)*		**R&D category of amendment** *(category A, B, C)* *For office use only*
		Nation	**Sites**	**Document**	**Version**	
1	Changes to the chief investigator's (CI) research team. There are two changes to the CI research team including: i. The rationale for the addition of a research assistant is to have an independent person conducting the interviews to ensure high quality data. The research team have noted to date that participants can be hesitant in their responses to the CI, particularly in relation to sharing their knowledge and/or potential challenges to their practice. This is because the CI has been an academic and leader in the field of	England	All sites	The research assistant's CV is included in this application (i.e. Gabriella Romano) The additional supervisor's CV as described in section ii is included in this application (i.e. Dr. Jane Chudleigh)	1 1	

	practice nursing, which is influencing data collection quality. Therefore, the research team endorse and recommend the recruitment of an independent research assistant to enable participants to be able to express their views openly. These interviews will be in person or via telephone based on what is preferred by the participant. ii. The research assistant – Dr. Gabriella Romano has expertise in conducting interviews. iii. The addition of a third supervisor is an experienced qualitative researcher, with child nursing expertise. The additional supervisor's CV is included in this application (i.e. Dr. Jane Chudleigh).					
2	Minor changes to the protocol or other study documentation, e.g. correcting errors, updating contact points, minor clarifications i. The CI will edit and amend the IRAS Project ID 106636 (*Practice Nurse influence on the uptake of the MMR*	England	All sites	The IRAS Project ID 106636 – *Practice Nurse Influence on the uptake of the MMR vaccine*		

	vaccine) to include reference to the research assistant and their contribution to recruiting and interviewing practice nurse participants. The CI will include the details of the additional supervisor. ii. Revision of the Participant Information Sheet to include the research assistant's details. iii. Revision of the Consent form. iv. Recruitment flyer to include the research assistant's details.			13 March 2019 Version 4 in line with GDPR guidance 25 May 2018 13 March 2019 Version 3 – in line with GDPR guidance 25 May 2018.	

				13 March 2019. Version 1.	
3	Extension of the study beyond the period specified in the application form The completion date was 31/12/2018. The request is to extend this date to 31/12/2019	England Sites	The IRAS Project ID 106636 – *Practice Nurse Influence on the uptake of the MMR vaccine* Section – A69 - 1		

2. Declaration(s)

Declaration by Chief Investigator

- I confirm that the information in this form is accurate to the best of my knowledge and I take full responsibility for it.
- I consider that it would be reasonable for the proposed amendment(s) to be implemented.

Signature of Chief Investigator:

Print name: Marie C. Hill

Date: 19 March 2019

Optional Declaration by the Sponsor's Representative (as per Sponsor Guidelines)

The sponsor of an approved study is responsible for all amendments made during its conduct.

The person authorising the declaration should be authorised to do so. There is no requirement for a particular level of seniority; the sponsor's rules on delegated authority should be adhered to.

- I confirm the sponsor's support for the amendment(s) in this notification.

Signature of sponsor's representative: 

Print name: Professor Chris Hull

Post: Associate Dean for Research and Enterprise, School of Health Sciences

Organisation: City, University of London

Date: 20-3-19

Amendment Categorisation and Implementation Information

Dear Mrs Hill,

IRAS Project ID:	106636
Short Study Title:	Practice Nurse influence on the uptake of the MMR vaccine
Date complete amendment submission received:	21/03/2019
Amendment No./ Sponsor Ref:	NSA 2 - changes to CI research team, minor changes to study documents and extension of study end date until 31st Dec 2019
Amendment Date:	21 March 2019
Amendment Type:	Non-substantial
Outcome of HRA and HCRW Assessment	**This email also constitutes HRA and HCRW Approval for the amendment,** and you should not expect anything further.
Implementation date in NHS organisations in England and Wales	35 days from date amendment information together with this email, is supplied to participating organisations **(providing conditions are met)**
For NHS/HSC R&D Office information	
Amendment Category	**A**

Thank you for submitting an amendment to your project. We have now categorised your amendment and please find this, as well as other relevant information, in the table above.

What should I do next?

Please read the information in IRAS, which provides you with information on how and when you can implement your amendment at NHS/HSC sites in each nation, and what actions you should take now.

If you have participating NHS/HSC organisations in any other UK nations please note that **we will** forward the amendment submission to the relevant national coordinating function(s).

If not already provided, please email to us any regulatory approvals (where applicable) once available.

When can I implement this amendment?

You may implement this amendment in line with the information in IRAS. Please note that you may only implement changes described in the amendment notice.

Who should I contact if I have further questions about this amendment?

If you have any questions about this amendment please contact the relevant national coordinating centre for advice:

- England – hra.amendments@nhs.net
- Northern Ireland – research.gateway@hscni.net
- Scotland – nhsg.NRSPCC@nhs.net
- Wales – research-permissions@wales.nhs.uk

Additional information on the management of amendments can be found in the IRAS guidance.

User Feedback

The Health Research Authority is continually striving to provide a high quality service to all applicants and sponsors. You are invited to give your view of the service you have received and the application procedure. If you wish to make your views known please use the feedback form available on the HRA website: http://www.hra.nhs.uk/about-the-hra/governance/quality-assurance/.

Please do not hesitate to contact me if you require further information.

Kind regards

[redacted]

Amendments Coordinator
Health Research Authority
Ground Floor | Skipton House | 80 London Road | London | SE1 6LH
E.hra.amendments@nhs.net
W. www.hra.nhs.uk