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The associations between medical, allied and complementary medicine practitioner visits and childhood vaccine uptake

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ABSTRACT

Background: Vaccination rates have remained steady for a number of years in Australia, however geographical areas of lower vaccine coverage remains a day-to-day challenge. The study explores parental attitudes, beliefs and intentions in relation to vaccination and examines the early effects of recent No Jab No Pay legislation.

Methods: A national survey of was conducted, using an online questionnaire. Parents from all states in Australia with at least one child aged <6 years were invited to participate.

Results: A total of 429 parents participated in the study. The substantial majority of participants reported having their youngest child's vaccination status up to date ($n = 401$, 93.5%). A child's vaccinations were more likely to be up to date if they had consulted a paediatrician in the previous 12-months (OR 5.01; 95%CI 1.05, 23.92; $p = .043$). Conversely they were less likely to be vaccinated if they were influenced by information from a complementary medicine (CM) practitioner (OR 0.03; 95%CI 0.01, 0.15; $p < .001$) or had visited a CM-practitioner (OR 0.09; 95%CI 0.02, 0.33; $p < .001$) in the previous 12-months. A total of 2.6% of parents had immunised their child as a result of the No Jab No Pay legislation, while 3.9% stated the legislation had no effect, and 1.2% said it had made them less likely to vaccinate. A further 1.2% of parents stated they are considering vaccination as a result of the legislative changes.

Conclusion: Parents who have not vaccinated their children appear to trust non-mainstream sources of information such as CM-practitioners. Further research is required to determine how to manage the challenges and opportunities of CM-practitioners as a source of vaccine information.

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1. Introduction

Vaccination has drastically reduced incidence of mortality and morbidity from infectious diseases worldwide, particularly through paediatric immunisation. Childhood vaccine uptake in Australia is high with full coverage recently reaching 92.9% for 5-year-olds [1]. Despite this overall success, areas of lower vaccine coverage remain, often clustering in geographical locations creating practice and policy concerns for public health officials. Beliefs about vaccination are not binary, falling anywhere in a broad-spectrum of intention. While some parents forgo immunisation altogether or selectively vaccinate, others cautiously follow the vaccination schedule or unreservedly vaccinate. Research high-

lighting the differences and reflexivity between these groups is crucial to understanding vaccine-hesitancy and rejection.

Recent legislative changes in Australia termed 'No Jab No Pay' have attempted to promote paediatric vaccination by withholding government benefits and rebates such as the Family Tax Benefit A, Child Care Benefit, and Child Care Rebate if children's vaccinations are not up-to-date [2]. With these measures, the Australian Government has removed previously allowable exemptions from vaccination requirements on grounds of religious or conscientious objection. While it is too early to understand the full impact of No Jab No Pay, recent data from the Australian Institute of Health and Welfare (AIHW) shows many geographical areas with sub-optimal vaccine coverage remain [1]. Vaccine-hesitancy traverses all communities from higher socioeconomic areas, where vaccine rejection is often thought to be more common, to lower socioeconomic areas where failure to keep up-to-date with the vaccination schedule may relate to obstacles in accessing health services [3]. Consequently, punitive financial measures may not

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impact all communities equally. Additionally, parents with philosophical objections may be less likely to consent to vaccination under financial pressure.

Health service use in Australia is often pluralistic with many Australians seeking care from multiple sources, including medical, allied health, and complementary medicine (CM) practitioners. CM covers a substantial broad-church of health-related practices and paradigms not found within conventional medicine [4]. Commonly accessed CM in Australia includes chiropractic, massage, naturopathy and traditional Chinese medicine [4]. Although estimates vary widely according to subpopulation and locality [4], a study found almost half of the Australian population had consulted a CM-practitioner in the previous 12-months [5].

Data from international studies have shown parents with concerns about vaccination are more likely to trust advice from CM-practitioners when seeking information about childhood immunisation [6]. Similarly, a recent Australian pilot study found children were less likely to be vaccinated if they had visited a CM-practitioner in the past 12-months [7]. Despite this finding and assertions by some that advice given by CM-practitioners may be contributing to vaccine rejection amongst parents [8], the nature of these conversations remains elusive.

While some international research exploring parental attitudes to vaccination has occurred, there is a dearth of published literature examining the attitudes, concerns, information-seeking and decision-making behaviours of Australian parents regarding vaccination, as noted recently in the *Medical Journal of Australia* [3]. It is, therefore, crucial to explore enablers and barriers to paediatric vaccination in Australia to assist development of appropriate communication strategies for effective parental decision-making. In direct response, the current study aims to determine: the attitudes and beliefs of parents towards childhood vaccination, the information sources parents are influenced by when making decisions about vaccination, and the effect of recent Australian legislative changes on parents' intentions to immunise their children.

2. Methods

2.1. Study design and participants

A quantitative, cross-sectional survey was piloted amongst 60 individual parents, representing 60 households from an area with low vaccine coverage in New South Wales. Subsequently, Australian parents were recruited nationwide via an online platform. The inclusion criteria for this study were Australian parents whose youngest child was aged up to 6 years. Exclusion criteria included non-Australian residents, adults without children and parents with children older than 6 years. A total of 785 parents completed the survey (response rate 12.5%), of which 429 met the inclusion criteria. Ethics approval was gained from University of Technology Sydney (ETH16-0666).

2.2. Materials

A questionnaire was adapted from previous instruments used in international research to examine parental attitudes to vaccination [9,10]. Items collected sociodemographic data alongside parental health service use and information seeking practices concerning vaccination for their youngest child. Beliefs about vaccination were measured using 13 items (Table 4) that were rated on a five-point Likert Scale (1 = strongly disagree to 5 = strongly agree). Item one was presented in a negative direction, requiring reverse coding. Tests of internal consistency found the combination of these items to be an excellent measure of beliefs about vaccination ($M = 2.02$, $SD = 0.753$, Cronbach's $\alpha = 0.91$, McDonald's $\omega = 0.92$).

An external research company (Stable Research) recruited parents across all states and territories of Australia in accordance with Australian Bureau of Statistics population data, attempting to represent each state/territory. Stable Research is an online platform that invites all adult members of the Australian public to participate in research. They are sent an email invitation to participate in a project when their profile is matched to the researcher's recruitment criteria. Participants earn points for every survey they complete and the amount of points attained are determined by the time it takes to complete the survey and the depth of knowledge required. Each survey invite tells participants how many points they will earn, and once a certain amount of points accumulate, they are redeemable as a gift voucher. Stable Research sent unique invitation emails to 6255 parents with at least one child in their care aged up to 6-years.

2.2.1. Participant sociodemographics

Sociodemographic items included parent's gender, age, state of residence, marital status and education. Parents were also asked whether they held a Health Care Card (entitles the family to government subsidies for health care, prescription medicines and other public services such as transport).

2.2.2. Vaccination status

Vaccination status of the child was recorded alongside reasons for not vaccinating (if applicable) and whether or not recent changes to legislation (regarding tax rebates, Child Care Benefit and Child Care Rebate (No Jab No Pay)) have influenced vaccination decisions. Vaccination status was recorded as either up-to-date or not up-to-date according to the current Australian Childhood Vaccination Schedule.

2.2.3. Parental attitudes toward vaccination

Likert scales using five-point measures from "strongly disagree" to "strongly agree" rated parental attitudes and beliefs about vaccination. Items covered issues such as the perceived value of vaccines (e.g. *Vaccines are important for my child*), perceived vaccine safety (e.g. *Vaccines contain ingredients that can cause harm*) and perceived vaccine efficacy (e.g. *There are better ways to protect children than vaccines*).

2.2.4. Health service utilisation

Respondents were asked to identify which information sources were influential in their decisions about vaccination for their youngest child. Visits to medical, allied health and CM-practitioners were recorded to explore health service use.

2.3. Data analysis

Raw data were extracted in an electronic spreadsheet and imported into statistical analysis software. Frequencies and proportions were calculated to describe sample sociodemographics, health service use, influence from information sources, and parental concerns and attitudes toward vaccination. Chi-square tests of association were conducted to assess relationships between socioeconomic and health-seeking factors, and vaccine uptake for the family's youngest child. Cramer's V was used to determine effect size.

Stepwise logistic regression was applied to produce the most parsimonious model predicting vaccination status. Demographic and health service use variables were entered into a model, with a stepwise backwards elimination process employed, using a likelihood ratio test. Statistical significance was set at $p < .05$ for all analyses. Analyses were conducted using STATA 14.1 software (StataCorp LP, College Station, TX, USA).

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