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Quality Improvement Project to Reduce Pain and Distress Associated With Immunization Visits in Pediatric Primary Care[1,2]

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This quality improvement project implemented an evidence-based immunization protocol aimed at decreasing pain and distress associated with immunizations for children ages 4 to 6 by utilizing distraction and a benzocaine-based anesthetic spray. The original protocol is used at a large, university-based pediatric primary care hospital. A convenience sample of 30 children from a community-based healthcare center was utilized to assess effectiveness in alternate settings. This quasi-experimental project collected survey information from child participants and consenting caregivers. Statistical analysis by paired t-test indicated a statistically significant decrease in reported distress by both the child and the caregiver utilizing the immunization protocol.

Background

Under immunization of children has become more prominent in the United States as more parents are following alternative vaccination schedules or refusing vaccinations all together. Evidence has linked vaccine refusal with outbreaks of vaccine preventable diseases (Omer, Salmon, Orenstein, deHart, & Halsey, 2009). A study by Atwell et al. (2013), further suggests clusters of unvaccinated individuals "may have been 1 of several factors in the 2010 California pertussis resurgence" (p. 624). The Centers for Disease Control and Prevention currently recommends children to be vaccinated against sixteen different illnesses. Most vaccinations are given as multi-dose series resulting in as many as 33 injections by age 6 years (CDC, 2014). The immunization protocol utilized by a primary care office can greatly impact the overall immunization experience. Stockwell, Irigoyen, Martinez, and Findley (2011) discovered an association between previous negative immunization experiences and under immunization in children. These findings imply that childhood experiences with immunizations have the potential to impact the incidence of vaccine preventable diseases. Therefore, steps should be taken to decrease painful and distressing immunization experiences to increase on-time vaccination. Furthermore, a "reduction in perceived pain or anxiety by the parent may promote timely return for future vaccinations" (Luthy, Beckstrand, & Pulsipher, 2013, p. 352).

Stress reduction is a common technique utilized during painful and distressing situations. In existing studies comparing stress reduction techniques, distraction appears to be a method of choice for pediatric patients. Providing appropriate distraction creates the potential to reduce the

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overall distress exhibited by the patients as well as their caregiver (Manne, Redd, Jacobsen, Gorfinkle, & Schorr, 1990). Manne et al. (1990) used party blowers as a means of distraction in children aged 3 to 9 years undergoing venipuncture while other studies have used touch screen electronic toys and virtual reality glasses. Reis and Holubkov (1997) studied the utilization of a.) distraction alone versus b.) distraction combined with a vapocoolant spray and c.) distraction combined with an eutectic mixture of local anesthetics (EMLA) cream during immunization procedures. Their findings indicate that using a method of distraction combined with the use of a vapocoolant spray is an effective, fast and inexpensive way to reduce the pain and distress associated with immunizations.

Immunizations are a recommended and beneficial procedure. Rarely are steps taken to decrease the associated pain and distress despite available evidence-based protocols due to time constraints (Weissenstein, Straeter, Villalon, Luchter, & Bittmann, 2013). Pain and distress are known barriers to meeting recommended immunization rates. The health care center where this project was implemented had not been using a standard protocol for immunizations aimed at decreasing pain and distress. To help lessen those aforementioned barriers to meeting recommended immunization rates, an evidence-based immunization protocol developed for and still in use at a large, university based pediatric primary care hospital was utilized. The goal of this project was to decrease pain and distress for both the patient and the accompanying caregiver by implementing an immunization protocol utilizing an active physical distracter and a benzocaine-based anesthetic spray with immunizations visits in an urban, community-based, primary care center.

Methods

Setting

This quality improvement project, guided by the Reis and Holubkov (1997) study findings, was completed in a small, urban, community-based health care center situated in a medically underserved neighborhood. The majority of patients have government funded insurance and benefit from the Vaccines for Children program where they receive vaccines at no cost. The pediatrician in the center has been serving this community for nearly 25 years, the nurse practitioner and medical assistant have been there 1 year and the registered nurses have each provided 2 years of service.

Human Subject Protection

The University of Pittsburgh Institutional Review Board considered this project to be exempt. Written consent was obtained from the caregivers of the participating patients.

Staff Education

To educate the staff in preparation for participating in this project, a lecture focusing on the importance of pain and distress reduction to aid immunization compliance and timeliness was provided to the two registered nurses, a nurse practitioner and a medical assistant. The project protocol was described, and the staff's role and participation was discussed. They were allowed to practice with the materials, and their questions were addressed.

Intervention

All children aged 4 to 6 years, receiving at least one immunization were eligible to participate unless there was a known sensitivity to benzocaine. Once a patient in the appropriate age range was identified on the schedule, a chart review was completed, prior to their scheduled appointment, to identify any known allergy or sensitivity to benzocaine. The patient/caregiver dyads were approached in their exam room after their immunizations were ordered by the MD or NP to assess their willingness and ability to participate in the project. A script was utilized to explain the project to the dyad. If they agreed to participate, a consent form, written at a fifth grade reading level, was signed and kept on file. A copy was provided to the signer.

After consent was gained, the dyad was instructed on how to fill out the short pre-immunization survey consisting of three questions which were read to the caregiver by the first author (see Box A). Before immunization, all children, were provided with a party blower as a distraction and instructed to blow it at the RN's, MA's or caregiver's moving hand, as if it were a target, during the procedure. Practice blowing was encouraged prior to the immunization.

The staff administering the injection sprayed the injection site with the benzocaine-based cooling spray for 5 to 10 seconds at least 3 inches away from the skin, waited 20 to 30 seconds, cleaned the site with alcohol and administered the injection per manufacturer's recommended route while facilitating the party blower use.

Following immunization, the caregiver completed the post-immunization survey consisting of three questions, nearly identical to the pretest, which were also read to the caregiver (see Box B). A cover sheet identifying the child's age, sex, reason for visit, accompanying caregiver, additional members in the room, immunization(s) received and who administered the immunization was completed, and all data forms were placed in a manila envelope to promote organization and confidentiality and were kept in a locked file box to await analysis.

Data Collection

Prior to immunization, the first author collected historical data from the accompanying caregiver utilizing Visual Analog Scales (VASs). These scales have been found to be