Motivational interviewing session at birth increases vaccination acceptance and uptake

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Significant gaps in coverage in both infant and adult immunization programs across the world mean that hundreds of millions of people are not being protected against serious infectious diseases. There are myriad reasons for low vaccine uptake including challenges to access, affordability, awareness, acceptance and simple activation of people to act.

This meeting will focus primarily on vaccine hesitancy, understanding the drivers and barriers to awareness, acceptance and activation, with a view to informing the development of effective strategies to close immunization gaps.

Information and education alone do not change behavior. So what might work?
Plan

- Promovac concept
- Motivational Interviewing of Miller and Rollnick and trans-theoretical model of Prochaska
- PROMOVAC studies
- Discussion
- Future prospects
The PROMOVAC concept

Need for an early strategy of promoting vaccination to avoid delays in first vaccines

- First vaccines at 2 months of age
- Delays in first vaccines were associated with delayed or incomplete vaccination schedule in childhood
- Nurseries should be a place for an early strategy of promoting vaccination

Failure of traditional educational or information's strategies

Motivational Interviewing of Miller and Rollnick and trans-theoretical model of Prochaska should be adapted to vaccination promotion
Motivational interviewing is ...

- a collaborative, goal-oriented style of communication
- with particular attention to the language of change.
- It is designed to strengthen personal motivation for and commitment to a specific goal
- by eliciting and exploring the person’s own reasons for change (solving their own ambivalence)
- within an atmosphere of acceptance and compassion.
- has been described as a promising tool for the health promotion strategy

Appiah-Brempong E. Am J Health Promot 2014;29:e32–4
The spirit of motivational Interviewing

The MI spirit emerges at the intersection of these four components:

- Collaboration
- Compassion
- Acceptance
- Evocation

*Motivational Interviewing*- Helping People Change. William R Miller, Stephen Rollnick, 3rd edition
The method of Motivational Interviewing

- Four key processes
  - **Engaging** is the process of establishing a helpful connection and working relationship.
  - **Focusing** is the process by which you develop and maintain a specific direction in the conversation about change.
  - The process of **evoking** involves eliciting the client’s own motivations for change and lies at the heart of MI.
  - The **planning** process encompasses both developing commitment to change and formulating a concrete plan of action.

- Core skills of MI (key communication skills)
  - asking open questions,
  - affirming,
  - reflecting,
  - summarizing,
  - providing information and advice with permission.

*Motivational Interviewing - Helping People Change. William R Miller, Stephen Rollnick, 3rd edition*
# Prochaska’s transtheoretical model

<table>
<thead>
<tr>
<th>PROCHASKA STAGES</th>
<th>PRE-COMTEMPLATION</th>
<th>CONTEMPLATION</th>
<th>PREPARATION</th>
<th>ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>VACCINATION INTENTION</td>
<td>NOT READY</td>
<td>GETTING READY</td>
<td>READY</td>
<td></td>
</tr>
<tr>
<td>Patient should not get vaccines</td>
<td>Ambivalence Patient don’t know if he wants to get vaccines. Lots of fears</td>
<td>Still ambivalence Patient wants to get vaccines but still some fears</td>
<td>Patient wants to get vaccines Patient know how to proceed</td>
<td></td>
</tr>
<tr>
<td>Possibilities of intervention</td>
<td>What disadvantages? What fears? Could he see some advantages to vaccination?</td>
<td>What fears? What advantages does he see to vaccination?</td>
<td>Does he have any fears? Could there be barriers to vaccination?</td>
<td>Does he have any fears? What vaccination schedule?</td>
</tr>
</tbody>
</table>
PROMOVAC studies

“PROMOVAC”
Aims of the study

Assess the effectiveness of an information session targeting immunization based on motivational interviewing techniques in nurseries on vaccination intention and vaccination coverage on infants

Specific goals:
1. Evaluation of the feasibility and acceptability of the program
2. Parents’ knowledge, attitudes, beliefs and vaccination intention analysis
3. Determinants of parents’ vaccination intention analysis
4. Impact of the information session on parents’ vaccination intention
5. Impact of the information session on infants’ vaccination coverage
6. To assess parents’ satisfaction to receive the intervention
Methods

- Study design and population
  - Cohort study
  - Sherbrooke University hospital nursery.

- Standardized information session
  - Five-point standardized information plan
  - Based on the Quebec Immunization protocol
  - Motivational Interviewing of Miller and Rollnick and trans-theoretical model of Prochaska

- Parents' knowledge, attitudes, beliefs and vaccination intention
  - Questionnaire based on the Health Belief Model was administered to all participants before and after the session

- Vaccination coverage
  - Immunization data from by the Eastern Townships Public Health register
Elaboration of a Five-point standardized information plan on vaccination easily understandable for parents

STEP 1  Presentation of the vaccine preventable Diseases
STEP 2  Vaccines and vaccines efficacy
STEP 3  Importance of the immunization schedule
STEP 4  Fears and reluctance about vaccination
STEP 5  Logistic organization of the vaccination in the Eastern townships
## Educational information session

### PROCHASKA STAGES

<table>
<thead>
<tr>
<th>PRE-COMTEMPLATION</th>
<th>CONTEMPLATION</th>
<th>PREPARATION</th>
<th>ACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOT READY</td>
<td>GETTING READY</td>
<td>READY</td>
<td>CONGRATULATE CONGRATULATE</td>
</tr>
<tr>
<td>Fears ?</td>
<td>Fears ?</td>
<td>Could there be barriers to vaccination ?</td>
<td>Could there be barriers to vaccination ?</td>
</tr>
<tr>
<td>Step 4 +++</td>
<td>Step 4 +++</td>
<td>Step 4 if needed</td>
<td>Step 4 if needed</td>
</tr>
<tr>
<td>Could you see some advantages to vaccination ?</td>
<td>Could you see some advantages to vaccination ?</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### INFORMATION

<table>
<thead>
<tr>
<th>INFORMATION</th>
<th>INFORMATION</th>
<th>ORGANISATION</th>
<th>ORGANISATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 1 et 2 ++</td>
<td>Step 1 et 2 ++</td>
<td>Step 5 +++</td>
<td>Step 5 +++</td>
</tr>
<tr>
<td>Step 3 +</td>
<td>Step 3 +</td>
<td>INFORMATION</td>
<td>INFORMATION</td>
</tr>
<tr>
<td>If you take decisions towards vaccination</td>
<td>If you take decisions towards vaccination</td>
<td>Step 1 ++ and 3 +++</td>
<td>Step 1 ++ and 3 +++</td>
</tr>
<tr>
<td>Step 5 ±</td>
<td>Step 5 ±</td>
<td>Step 2 +</td>
<td>Step 2 +</td>
</tr>
</tbody>
</table>
Flow chart - Feasibility and acceptability

2717 deliveries (adult living in Eastern Townships) → 1225 families not contacted i.e. 1249 children (Control group)

1492 families contacted → 163 primary refusals

1329 families agreed to participate (89%) → 201 families unavailable

1128 families received educational information i.e. 1140 children (Experimental group) (85%)

Feasibility 90% Acceptability 85%

97% parents recommended to offer the intervention to others parents
Impact on parents’ vaccination intention

Pre and post intervention parents’ vaccination intention

## Impact on infants’ vaccination coverage

<table>
<thead>
<tr>
<th>Vaccination coverage (VC)</th>
<th>Expérimental Group</th>
<th>Control Group</th>
<th>Increase of VC (%)</th>
<th>p</th>
<th>RR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n = 1140</td>
<td>n = 1249</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 m</td>
<td>1041 (91,3)</td>
<td>1101 (88,1)</td>
<td>+3,2</td>
<td>0,01</td>
<td>1,04 (1,01-1,06)</td>
</tr>
<tr>
<td>5 m</td>
<td>948 (83,2)</td>
<td>978 (78,3)</td>
<td>+4,9</td>
<td>&lt; 0,01</td>
<td>1,06 (1,02-1,10)</td>
</tr>
<tr>
<td>7 m</td>
<td>865 (75,9)</td>
<td>857 (68,6)</td>
<td>+7,3</td>
<td>&lt; 0,001</td>
<td>1,11 (1,05-1,16)</td>
</tr>
</tbody>
</table>
Impact on 0-2 years infants’ vaccination coverage

<table>
<thead>
<tr>
<th>Time (months)</th>
<th>Percentage of children with a complete vaccine status</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>91.3</td>
</tr>
<tr>
<td>5</td>
<td>88.1</td>
</tr>
<tr>
<td>7</td>
<td>83.2</td>
</tr>
<tr>
<td>9</td>
<td>78.3</td>
</tr>
<tr>
<td>11</td>
<td>75.9</td>
</tr>
<tr>
<td>13</td>
<td>68.6</td>
</tr>
<tr>
<td>15</td>
<td>66.2</td>
</tr>
<tr>
<td>17</td>
<td>59.5</td>
</tr>
<tr>
<td>19</td>
<td>56.7</td>
</tr>
<tr>
<td>21</td>
<td>46.1</td>
</tr>
<tr>
<td>23</td>
<td>74.3</td>
</tr>
</tbody>
</table>

RR (95% CI) \( p \)

1.09 (1.05-1.13)\(<0.001

Univariate logistic regressions with repeated measures according to the Generalized estimating equations (GEE) procedure with Poisson distribution:
To estimate the chance for a child to have a complete vaccine status during early childhood

Gagneur A et al. European Society for Pediatric infectious disease 2016, Brighton 10-14 may
### Impact on 0-2 years infants’ vaccination coverage

<table>
<thead>
<tr>
<th></th>
<th>Unadjusted RR (95% CI)</th>
<th>Adjusted RR (95% CI)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intervention</strong></td>
<td>1.09 (1.05-1.13)</td>
<td>1.05 (1.02-1.07)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td><strong>Complete vaccine status at 3 months of age</strong></td>
<td>2.72 (2.20-3.37)</td>
<td>6.81 (5.58-8.30)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td><strong>Time</strong></td>
<td>0.99 (0.99-0.99)</td>
<td>0.99 (0.99-0.99)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td><strong>Mother’s age</strong></td>
<td>1.00 (1.00-1.00)</td>
<td>1.00 (1.00-1.01)</td>
<td></td>
</tr>
<tr>
<td><strong>More than one child</strong></td>
<td>0.90 (0.88-0.93)</td>
<td>0.91 (0.88-0.93)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td><strong>Caesarean delivery</strong></td>
<td>0.97 (0.93-1.01)</td>
<td>0.99 (0.96-1.02)</td>
<td></td>
</tr>
<tr>
<td><strong>Neonatology hospitalization</strong></td>
<td>0.90 (0.83-0.95)</td>
<td>0.96 (0.92-1.01)</td>
<td></td>
</tr>
</tbody>
</table>

Multivariate GEE models with repeated measures with Poisson distribution:

To estimate the chance for a child to have a complete immunization status to 24 months depending on whether or not parents have received the intervention adjusting for immunization status at three months, time, age of the mother, the number of children of the mother, caesarean delivery and hospitalization in neonatology.
PROMOVAC studies

“PROMOVAQ”
PROMOVAC to PROMOVAQ

- Provincial RCT
- Regional disparities
- 4 maternity wards (20% of annual births)
  - Montréal (Ste Justine, Royal Victoria),
  - Québec,
  - Sherbrooke
- FRQS and MSSS fundings, INSPQ partnership
- Opel’s questionnaire on Vaccine hesitancy
- 2700 families enrolled
A significant increase in vaccination intention was observed in each center after the intervention, with a global increase of 12% (p<0.001).
A significant decrease in Opel’s vaccine hesitancy score was also observed in each maternity ward after the intervention, with a global decrease of 40% (p<0.0001).
Impact on parental vaccination hesitancy score

Gagneur A et al. European Society for Pediatric infectious disease 2016, Brighton 10-14 may
## Impact on vaccination coverage (2/4 nurseries)

<table>
<thead>
<tr>
<th>Vaccination coverage (VC)</th>
<th>Intervention Group n = 629</th>
<th>Control Group n = 627</th>
<th>Increase of VC (%)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n (%)</td>
<td>n (%)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 m</td>
<td>558 (88.7)</td>
<td>525 (83.7)</td>
<td>+ 5.0</td>
<td>0.01</td>
</tr>
<tr>
<td>5 m</td>
<td>526 (83.6)</td>
<td>510 (81.3)</td>
<td>+ 2.3</td>
<td>0.29</td>
</tr>
<tr>
<td>7 m</td>
<td>503 (80.0)</td>
<td>463 (73.8)</td>
<td>+ 6.2</td>
<td>0.01</td>
</tr>
</tbody>
</table>
Discussion-reflexions : What works ?

- No conflict of interest with the counsellor
- 2 months before the first vaccine (time to take decision)

- Infant’s vaccination induce stress to parents ?
  - Novelty
  - Unpredictability
  - Threat to the ego
  - Sense of control

- Intervention tailored to the needs
  - Informations
  - Educational methods

- Tailored informations
- Motivational interviewing
Determinants of vaccination behavior

- Distrust in public Health authorities
- Vaccines risk
- Subjectives norms
- Vaccines benefits
- Perceived necessity of vaccines
- Perceived severity or vulnerability to diseases
- Insufficient knowledge
Determinants of vaccination behavior for me ....

- Distrust in public Health authorities
- Perceived necessity of vaccines
- Vaccines benefits
- Vaccines risk
- Perceived severity or vulnerability to diseases
- Subjectives norms
- Insufficient knowledge
- Insufficient knowledge
Determinants of vaccination behavior for him ...

- Insufficient knowledge
- Perceived severity or vulnerability to diseases
- Vaccines benefits
- Subjectives norms
- Perceived necessity of vaccines
- Vaccines risk
- Distrust in public Health authorities
Most parents reported not actively processing information about the benefits and drawbacks before deciding whether to have their child vaccinated.

Only 19% of parents reported having thought about the issue thoroughly before making the decision.

This might indicate that the overall positive attitudes and high vaccination intentions are not very stable and therefore susceptible to counter-arguments.

Decisional process

Influential Factors, such as:
- Knowledge
- Risk/Benefice evaluation
- Context
- Social Norm
- Media

Trigger(s)

Initial positioning about vaccination

Information seeking

Cognitive Process
- Information assimilation
- Reflections
- Analysis of content on Risk and Benefit
- Credibility of information

Intention / Decision
- Compliance
- Adaptation of Recommendations

Evaluation of experience

Vaccination Behavior
Decisional process

Vaccination?

- Vaccines risk
- Distrust in public Health authorities
- Perceived severity or vulnerability to diseases
- Perceived necessity of vaccines
- Vaccines benefits
- Subjectives norms

CONTROVERSIES

AMBIVALENCE

YES

NO
PROMOtion Vaccination in Canada
- RCT in 4 provinces (BC, NS, ON, QC)
- CIRN and CRCHUS fundings, INSPQ partnership
- Validation in different cultural and logistical contexts

PROMOVACCIC
- International RCT (Canada, France, Austria, Italy and ...?)
- European CDC collaboration
- Canadian Institute Health research grant submission
- Universal validation of the concept
Future prospect in Quebec

- First phase of implementation
  - Health ministry decision
  - Maternity wards > 2500 annual births (55% of births)
  - 13 hospitals in 7 regions
  - Recruitment of 20 vaccination counsellors
  - Funded by Health ministry (1 million $) and Canadian Public Health agency (750 000$)
  - Evaluation study of implementation and results in VC

- According to first phase implementation results, extension to a provincial public health policies.

- Training in MI adapted to vaccination to health care providers
  - 2 days session
  - Implemented in Eastern Towships in 2015
Acknowledgements

Research team: Thomas Lemaitre, Anne Farrands, Marie-Laure Specq, Virginie Gosselin

Eastern Townships Public Health collaborators: Geneviève Petit, Genevieve baron, Ariane Grégoire, Pierrot Richard, Louise Soulière

Maternity wards staff

INSPQ collaborators: Eve Dubé, Nicole Boulianne, Chantal Sauvageau

PROMOVAQ investigators: E Dubé, A Farrands, T Lemaitre, N Boulianne, C Sauvageau, FD Boucher, B Tapiero, C Quach, M Ouakki, V Gosselin, D Gagnon, P De Wals, G Petit, M-C Jacques

Parents involved in the study
The art of persuasion is as much about agreeing as it is about convincing."

Blaise Pascal (1623-1662)