

Delphi Birth Professional Study: Factors needed for Pre- and Perinatal Parenting Programs

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Abstract: Using a three-round hybrid Delphi methodology, the current study utilized a panel of “expert” birth professionals ($n=20$ after three rounds) to examine content and logistical factors that may be most effective for inclusion in the design, development, and delivery of pre- and perinatal (PPN) parenting programs of the 21st century. The purpose was to attain consensus on 235 items generated from literature and the panelists. Consensus per item was deemed achieved where 75% [dis]agreement was reached, which occurred for 157 (66.81%) items. Most notable were factors that may impact the development of prenatals during gestation and post-birth that pregnant couples may benefit from learning about, content, barriers to fathers attending, parent cohort who may best benefit from attending, effective methods and locations of program delivery, and who is best qualified to facilitate programs. Consensus was not attained when the factors of program timing and length were considered. Numerous limitations relating to the study design were identified and future research could focus on creating PPN parenting programs that are flexible in design to suit individual needs of mothers, fathers, and couples. The effectiveness of future PPN parenting programs could be measured using randomized clinical trials that include waitlists, control groups, and contrast treatments, for comparison.

Keywords: Delphi, pre- and perinatal parenting programs, pre- and perinatal psychology, pregnancy, parenting

Whilst becoming a parent is often a happy and joyful event filled with positive expectations (Rosand, Slinning, Eberhard-Gran, Roysamb, & Tambs, 2011), research shows expectant parents commonly report not having the skills, information (Gazmararian et al., 2014), nor self-efficacy (Davis, Vyankandondera, Luchters, Simon, & Holmes, 2016) to confidently embark on the transition to parenthood. A key benefit of parents engaging in pre- and perinatal (PPN) parenting programs is the optimization of the physical, mental, and emotional health of mothers, fathers, and babies (Glied & Oellerich, 2014). Existing literature suggests

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positive outcomes for parents who attend PPN parenting programs may include: improved prenatal care, positive parenting post-birth, decreased maternal stress and paternal anxiety, and enhanced emotional and social support (Abu-Saad & Fraser, 2010; Charandabi, Mirghafourvand, & Sanaati, 2017).

Despite the benefits of participation in PPN parenting programs, attendance and engagement has not been reached at the population level when pregnant women and expectant fathers are targeted (Deslauriers, Devault, Groulx, & Sevigny 2012; Piotrowska et al., 2017). Furthermore, there are no standardized guidelines for the provision of PPN parenting programs (Jongen, McCalman, Bainbridge, & Tsey, 2014). This extends to lack of consensus regarding content, timing of program start, length and number of sessions, target cohorts, who ought to deliver programs, and modes of delivery for optimal engagement.

Research supports that if PPN parenting programs are to be perceived by parents as effective and of value, programs of the future need to be designed to meet the unique needs of parents who attend (Ayiasi et al., 2013). Factors such as knowledge, skills, support, and logistics such as location, modes of program delivery, and access to resources relating to the PPN time-frames need to be considered (Alalshaikh, 2015; Lotrecchiano, McDonald, Lyons, Long, & Zajicek-Farber, 2013). Whether existing PPN parenting programs are currently designed to meet the needs of modern-day parents has been questioned (Hauck, Fisher, Byrne, & Bayes, 2016).

Given the lack of a gold standard in PPN parenting programs, the current study (the final of four in the primary author's PhD program of research) utilized Delphi methodology to determine birth professionals' perceptions of factors considered to be important for consideration when designing, developing and delivering PPN parenting programs of the future. The goal being to further understand which factors may maximize program relevance to meet modern-day needs of expectant parents, and minimize stress and anxiety experienced by couples during the time of pregnancy. The purpose of this article is to introduce Delphi methodology and provide a summary of results that emerged from the birth professional expert panel. Of note, results from a second Delphi study conducted concurrently, that utilized a parent cohort, have been published elsewhere.

Method

Ethical approval was granted by Bond University Human Research Ethics Committee and data was gathered between November 2016 and February 2017. Delphi methodology was meticulously followed. This research design has traditionally been used to focus on specific issues where validated theory does not yet exist (Jenkins & Smith, 1994), and has been widely used to determine factors associated with curriculum

development, design, and delivery features of educational programs and interventions (Desroches et al., 2015; Phillips et al., 2014; Stathakarou, Zary, & Konowicz, 2015; Warner, 2014), which is in alignment with the current study. Delphi methodology is depicted by several factors: a homogeneous sample of between 10 and 30 subject matter experts (Delbecq, Van de Ven, & Gustafson, 1975; Keeney, Hasson, & McKenna, 2011); the use of non-probability sampling such as snowball technique (Warner, 2014) or experts being invited to participate (Hasson, Keeney, & McKenna, 2000); literature and panel member items being generated for consensus rating by a participating panel (Hasson et al., 2000), the use of questionnaires (Desroches et al., 2015), multiple rounds—between two and four, with the intention being for the panel to attain consensus across items (Dawson, Rhodes, & Touyz, 2015; Desroches et al., 2015); and analysis based on agreed upon consensus percentages along with feedback to panelists between rounds (James & Warren-Forward, 2015).

Expert Panelists and Recruitment

Whilst no agreed upon definition of the term *expert* exists for Delphi methodology, in general, it is agreed that panelist contributions need to reflect current knowledge of the topic of interest (Hasson et al., 2000; James & Warren-Forward, 2015). Criteria for inclusion as a birth professional in this study comprised: (1) being either an OB/GYN, midwife, doula, Registered Nurse (RN) specializing in pregnancy and birth, therapist, Marriage and Family Therapist (MFT), psychologist, coach (with PPN expertise and/or working with couples or families), or childbirth educator; (2) who was certified/licensed at the time of completing the study; and (3) had been active in the field for at least five years. A three-tiered recruitment approach was utilized: a social media advertisement, snowball technique where a request was made on social media to share the invitation to participate with birth professionals who may meet the expert criteria, and direct email to birth professionals. One hundred and five people responded to the invitation to participate. All were emailed the details of the study and notification they would receive a fifty dollar gift voucher (Amazon, Coles-Myer) funded by an Australian Government Research Training Program scholarship, upon successful completion of all three rounds. Forty experts (38.10%) agreed to begin the study. A quasi-anonymous design was utilized, where identity details remained unknown between panel members, yet were known to the [then] student researcher, enabling questionnaire links and results to be shared for each round of the study.

Materials

Three rounds of online questionnaires were created for the completion via Qualtrics Research Suite.

Procedure

Devising the round one questionnaire.

In circumstances where panelist fatigue may be an issue (Jenkins & Smith, 1994), a hybrid variation to the Delphi methodology can be utilized when formulating a round one questionnaire. This involves inclusion of literature-derived content as well as the use of open-ended questions to gather ideas unique to the expert panelists (Hasson, Keeney, & McKenna, 2000; Iqbal & Pison-Young, 2009). Due to there being 19 questions included in the round one questionnaire, panelist attrition due to fatigue was a risk, and a hybrid variation was incorporated. Specifically, the questions that formulated the round one questionnaire (Table 1) were derived from existing PPN parenting program literature as well as data generated from parent samples in the first two studies of the PhD program of research and full results have been published elsewhere (McKee, Stapleton, & Pidgeon, 2017, 2018). The intention of round one was to formulate a list of items that expert birth professionals perceived needed to be considered when future PPN parenting programs are designed, developed and delivered.

The round one questionnaire was pilot-tested (Hasson et al., 2000; Iqbal & Pison-Young, 2009) on three birth professionals who met the inclusion criteria and minor wording and grammatical changes were made.

Table 1

Questions Asked, Question Type and Items Generated for Expert Birth Professional Panelist Ratings in Rounds 2 and 3

Question	Question Type			Items Generated in Round 1 for Consensus Rating Rounds 2/3	
	Likert in round 1 (Y/N)	Open- Ended in round 1 (Y/N)	Check- Box + "Other" in round 1 (Y/N)	Literature	Panelist

What factors do you believe may impact both the development of prenatates during gestation, and influence who babies become post birth?	Y	Y	N	16	23
What content do you think is most effective regarding the needs of expectant parents when considering PPN parenting programs?	N	Y	Y	25	23
What content do you think is ineffective regarding the needs of expectant parents when considering PPN parenting programs?	N	Y	N	0	24
What stage of the pregnancy do you believe is the most effective time for PPN parenting programs to start?	N	Y	N	0	9
What do you believe is the most effective time for PPN parenting programs to end?	N	N	Y	4	1
What do you believe is the most effective platform for delivery of PPN parenting programs?	N	N	Y	11	1
How do you believe information in PPN parenting programs can most effectively be presented/delivered?	N	N	Y	9	0
Who do you believe should attend PPN parenting programs?	N	N	Y	5	3

Research shows that fathers/partners attend less pregnancy and parenting related sessions/programs than expectant mothers. In your opinion, what factors would contribute to that being true?	N	Y	N	0	18
Which groups of parents do you believe may benefit from having access to PPN parenting programs?	N	N	Y	6	8
What do you believe is the most effective length of each session in PPN parenting programs?	N	Y	N	0	9
In your opinion, what is the most effective amount of time between each session?	N	Y	N	0	6
What do you believe is the most effective overall length of PPN parenting programs in time (e.g., number of weeks or months)?	N	Y	N	0	15
In your opinion who ought to deliver PPN parenting programs?	N	N	Y	9	7
To ensure new PPN parenting programs are relevant and up-to-date, what current practices and/or theories that relate to conception, pregnancy, birth, and post birth do you believe would be of value to educate pregnant couples on?	N	Y	N	0	25
What other considerations (if any) do you believe are important for PPN parenting programs to be effective?	N	Y	N	0	0

Procedural overview.

Panelists were invited to complete three rounds of the online questionnaire. They were given 14 to 21 days to complete each round, with three-week intervals between rounds. This enabled data analysis, write-up of results for reporting back to panelists, and development of the subsequent round online questionnaire.

Consensus criteria used across the three rounds.

Consensus was considered reached when either *strongly agree* or *disagree* on the five-point Likert scale (strongly agree, agree, neutral, disagree, strongly disagree) used were selected by 75% or more of panelists (Dawson et al., 2015; Desroches et al., 2015). This *a priori* criterion (James & Warren-Forward, 2015) was followed as a standardized criteria for when consensus is considered reached in Delphi methodology studies does not exist, with previous researchers reporting levels ranging between 51% and 100% (Holey, Feeley, Dixon, & Whittaker, 2007; Keeney, Hasson, & McKenna, 2006). Subsequent rounds included the items that did not attain consensus, for re-rating by the expert panelists.

Analysis procedure used across the three rounds.

Data analysis was conducted at the end of each of the three rounds. Braun and Clarke's (2006) five-step thematic analysis approach was used to analyze verbatim information collated from round one. Quantitative data generated from the five-point Likert scales in all rounds were analyzed using IBM SPSS Statistics 24. In accordance with the most common forms of analysis completed, calculation of central tendency (Mean, Median), Standard Deviation as a measure of variability (Dawson et al., 2015; Keeney et al., 2011) and percentage rating of each item by panelists as a collective group (Hejblum et al., 2014; Phillips et al., 2014) was conducted. The percentage values determined whether or not consensus was considered reached on each item. The Delphi methodology undertaken is outlined in Figure 1.

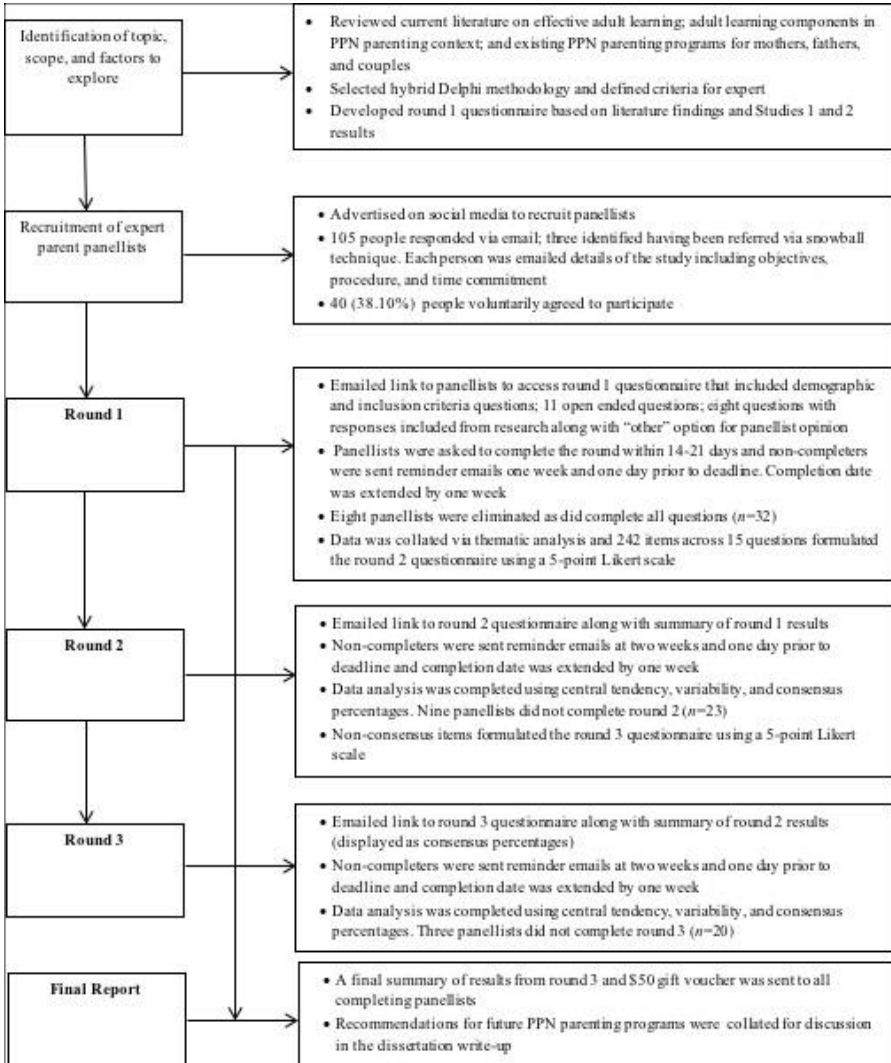


Figure 1. Visual representation of Delphi methodology

Round One.

Each panelist gave informed consent within the online questionnaire by typing “yes” to continue after reading the explanatory statement. Nineteen questions were answered and comprised: one five-point Likert rating question devised from the results of two earlier studies in the PhD program; 11 open-ended questions; and seven questions that had a combination of checkbox options drawn from the literature, as well as an

“other” option to capture verbatim feedback. Table 1 (above) details the questions asked, question format, and number of items generated per question for consensus rating by panelists in rounds two and three.

Round Two and Three.

The purpose of rounds two and three was to attain group consensus on items generated per question, as a result of thematic analysis completed after round one. A summary table of round two results per question was included with the round three questionnaire. Items that did not attain consensus were presented to panelists for re-rating. Final results were made available for viewing by all panelists on Qualtrics Research Suite.

Results

The starting panel consisted of 29 females (90.6%) and three males (9.4%), aged between 26 and 87 years ($M=52.81$; $SD=15.28$), from across four countries (USA=87.5%; Australia=3.1%; Canada=3.1%; Israel=3.1%). When the expert birth professional criterion was considered, the majority of panelists were PPN therapists (43.8%), followed by midwives (15.6%), and RNs who were specialists in pregnancy and birth (15.6%). One OB/GYN participated (3.1%), along with four doulas (12.5%) and three childbirth educators (9.4%). On average, panelists had been in their role for 23.09 years ($SD=14.67$ years), with the range being five to 54 years. See Table 2 for panel demographics.

Table 2
Demographics of Expert Birth Professional Panelists

Variable	N	%	M (years)	SD (years)	Range (years)
Age	32		52.81	15.28	26-87
Gender	32				
Female	29	90.6			
Male	3	9.4			
Country live in	32				
USA	28	87.5			
Australia	1	3.1			
Other	2	6.2			
Marital status	32				
Living with partner	5	15.6			
Married	16	50.0			
Divorced	5	15.6			
Separated	2	6.3			
Single	4	12.5			
Education level	32				
High school	1	3.1			
Tech/vocational college	5	15.6			
Doctoral	7	21.9			
Bachelor's degree	7	21.9			
Master's degree	9	28.1			
Other	3	9.4			
Number of children	32				
0	10	31.3			
1	5	15.6			
2	7	21.9			
3+	10	31.2			
Role	32				
OB/GYN	1	3.1			
Midwife	5	15.6			
Doula	4	12.5			
RN (pregnancy and birth)	5	15.6			
PPN Therapist	14	43.8			
Childbirth educator	3	9.4			
Currently facilitate PPN classes	32				
Yes	14	43.8			
No	18	56.3			

There was a 71.88% completion rate in round two ($n=23$), and 20 panelists (86.96%) went on to finish the third and final round and was represented by two males (10%) and 18 females (90%).

A total of 242 items for consensus rating were presented to the expert birth professional panelists, across the three rounds of the study. Consensus was achieved for 157 items (64.88%) and examples, by survey question, can be seen in Table 3. The remaining 85 items (35.12%) did not reach agreement and examples are detailed in Table 4. Items denoted with ** in both tables refer to items drawn from literature. All other items were identified by the panelists.

Table 3
Items by Question that Attained Consensus across Rounds 1 to 3

Question and Items	M	Mdn	SD	Consensus (%)
<i>Factors that may impact both development of prenatates during gestation and influence who babies become post birth</i>				
Maternal diet **	1.22	1.00	0.49	96.9
Substances (e.g., alcohol, nicotine, pesticides) **	1.13	1.00	0.34	100
DNA **	1.47	1.00	0.57	96.9
Mother-prenate relationship in the womb (e.g., degree of being wanted, interaction between mum and prenatate throughout the pregnancy) **	1.19	1.00	0.47	96.9
Father-prenate relationship in the womb (e.g., degree of being wanted, interaction between dad and prenatate throughout the pregnancy) **	1.41	1.00	0.67	90.7
Life stress experienced by mum and dad at time of conception and during the pregnancy **	1.19	1.00	0.40	100
Level of physical activity for general health of mum during the pregnancy **	1.72	2.00	0.63	90.6
Maternal stress, anxiety, and/or depression **	1.13	1.00	0.34	100

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Paternal stress, anxiety and/or depression **	1.41	1.00	0.56	96.9
Mother's and father's perceptions (thoughts, attitudes, feelings, beliefs; both positive or negative) of each other, events and environment experienced during pregnancy **	1.19	1.00	0.47	96.9
Quality of relationship between the mother and father at time of conception and during the pregnancy **	1.34	1.00	0.70	93.8
Maternal abuse (mental, physical, emotional) **	1.09	1.00	0.30	100
General health of mother at time of conception and during the pregnancy (e.g., weight, blood pressure) **	1.34	1.00	0.48	100
Social support available to the mother during pregnancy and beyond	1.26	1.00	0.45	100
Social support available to the dad during the pregnancy and beyond	1.74	2.00	0.62	91.3
Mother's and father's perception of ability to be a 'good enough' parent	1.57	2.00	0.59	95.7
Epigenetics (e.g., stress and trauma imprinting passed down through the generations and influencing the prenaté's genes being turned 'on' or 'off' in response to the imprint)	1.35	1.00	0.49	100
Unprocessed attachment and relational trauma of the mum	1.17	1.00	0.39	100
Mum's ability to self-regulate her nervous system to a calm and restful state consistently each day during the pregnancy	1.26	1.00	0.45	100
Mum's perception of her ability to grow, birth, and parent her baby	1.35	1.00	0.49	100

Ability for mum and dad to engage with each other and with the baby from a place of secure attachment during the pregnancy and beyond	1.30	1.00	0.47	100
Quality of the birthing experience for mum, dad, and baby	1.48	1.00	0.79	91.3
The level of conscious connection created intentionally between both parents and baby in-utero and post birth	1.30	1.00	0.56	95.7
Mum’s and dad’s ability to heal unresolved issues from their own womb, birth, and childhood experiences; how they were parented; and from any previous pregnancy losses	1.30	1.00	0.77	91.3
Love being expressed to the prenaté from conception onwards	1.30	1.00	0.47	100
Mum and dad differentiating any negative/challenging thoughts, feelings, and experiences during the pregnancy from the prenaté (and baby post birth) using coherent dialogue directed towards the baby	1.65	1.00	0.94	91.3
Mum’s level of self-care during pregnancy and post birth	1.13	1.00	0.34	100
Unprocessed trauma of mum and/or dad relating specifically to sexual abuse	1.39	1.00	0.50	100
<i>Content perceived to be most effective regarding needs of expecting parents when considering PPN parenting programs</i>				
Healthy and adaptive coping skills for the changes parenthood brings **	1.17	1.00	0.39	100
How to ask for the birth you want in a hospital setting **	1.22	1.00	0.52	95.7

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How to soothe baby **	1.22	1.00	0.42	100
General bonding and attachment skills **	1.17	1.00	0.39	100
Ways the father can bond with baby during pregnancy and post birth **	1.09	1.00	0.29	100
Skills for couple connection, communication, and working together **	1.13	1.00	0.34	100
Birth options **	1.22	1.00	0.42	100
Pregnancy health **	1.26	1.00	0.45	100
Preparation for labour and childbirth **	1.22	1.00	0.42	100
Breastfeeding **	1.39	1.00	0.58	95.7
Skills for building secure attachment between the couple **	1.35	1.00	0.49	100
Being aware of generational parenting patterns **	1.35	1.00	0.57	95.7
Education on conscious awareness of baby in-utero **	1.30	1.00	0.56	95.7
Mindfulness skills for pregnancy, labour, birth, and post birth **	1.35	1.00	0.49	100
Intentional communication to babies during pregnancy **	1.22	1.00	0.52	95.7
Strengthening the couple relationship for the transition to parenthood (e.g., communication, role identity, maintaining intimacy, getting needs met, conflict resolution, how to emotionally support each other, create, maintain, and sustain connection) **	1.09	1.00	0.29	100
Ways to include dad/partner from conception onwards **	1.13	1.00	0.34	100
Role identity through the transition to parenthood **	1.35	1.00	0.49	100

Self-care **	1.13	1.00	0.34	100
(Non-judgmental) education on factors that influence a prenaté's experience in the womb	1.52	1.00	0.95	91.3
Stress management skills	1.22	1.00	0.52	95.7
Education on birth and care choices - how to say 'no' and stay empowered in a birthing environment	1.39	1.00	0.72	95.7
Importance of skin-to-skin contact post birth	1.09	1.00	0.29	100
Education on physiological and psychological development in the prenatal period	1.57	1.00	0.66	91.3
Understanding communication cues, reactions, and cries of baby post birth	1.22	1.00	0.42	100
Tools for expecting parents to heal their own birth trauma and early imprints	1.65	1.00	1.03	91.3
How to overcome fears relating to pregnancy, birth, and being a parent	1.09	1.00	0.29	100
How to integrate siblings to the new family structure during pregnancy and post birth	1.26	1.00	0.45	100
Mindfulness skills for developing healthy and respectful relationships with self, partner, and baby	1.30	1.00	0.47	100
Shared parenting skills	1.52	1.00	0.67	91.3
Importance of physical and emotional contact between both parents and baby in the perinatal period	1.30	1.00	0.47	100
Pregnancy and parenting resources available (in local community and evidence-based research)	1.17	1.00	0.49	95.7

Managing expectations of parenting (e.g., debunking perfectionism and education on 'good-enough' parent)	1.26	1.00	0.54	95.7
Rights and choices as a parent regarding newborn procedures	1.26	1.00	0.54	95.7
<i>Content perceived to be ineffective regarding needs of expecting parents when considering PPN parenting programs</i>				
Any content area that has bias, judgement, and/or an agenda	1.39	1.00	0.66	91.3
Any content that disempowers either the mother or the baby	1.35	1.00	1.03	91.3
Content that emphasises the medical model for birthing only	1.57	1.00	0.79	91.3
<i>Current practices and/or theories that relate to conception, pregnancy, birth, and post birth that would be of value to educate pregnant couples on</i>				
PPN psychology	1.48	1.00	0.79	91.3
Post-partum maternal mood disorders	1.30	1.00	0.56	95.7
Bonding and attachment theory	1.22	1.00	0.56	95.7
Consciousness of unborn and neonate	1.30	1.00	0.56	95.7
Informed choice for circumcision	1.48	1.00	0.79	91.3
Sacred hour: skin-to-skin contact	1.04	1.00	0.21	100
Midwifery model of care	1.39	1.00	0.58	95.7
Conscious parenting	1.35	1.00	0.71	95.7
Mindfulness for parenting	1.48	1.00	0.73	95.7
Self-regulation for mum, dad, and baby	1.39	1.00	0.58	95.7
Neuroscience in context of the developing prenatate and neonate	1.61	1.00	0.78	91.3 95.7

Delayed cord clamping	1.35	1.00	0.71	
<i>Factors that may contribute to fathers/partners attending fewer pregnancy and parenting related sessions/programs than expecting mothers</i>				
Lack of support from workplaces for fathers to take time away from work to attend classes	1.39	1.00	0.50	100
Information in many prenatal classes are targeted towards mum and baby only with little direct content targeted to the role of father	1.83	2.00	0.89	91.3
Fathers not being invited/encouraged to attend classes by their partner, service providers, or both	1.65	2.00	0.71	95.7
Perception by fathers that it is not manly to attend	1.83	2.00	0.72	91.3
Societal and cultural norms that pregnancy is women's business	1.57	2.00	0.59	95.7
Lack of role identity by an expecting father	1.65	2.00	0.57	95.7
Fathers may feel left out and as though they do not belong when they attend class	1.78	2.00	0.60	91.3
General lack of understanding of the importance of the role of fathers in the wellbeing of growing prenatates	1.39	1.00	0.50	100
Lack of father-to-father mentoring in current programs	1.61	2.00	0.58	95.7
Cultural and societal norms where boys are not taught from a young age to become caring, supportive, self-responsible, and empowered men and fathers	1.65	2.00	0.65	91.3

Males have a more natural confidence about parenting than do women and do not feel the need to attend	4.43	4.00	0.59	95.7 (Disagree)
<i>Groups of parents who may benefit from having access to PPN parenting programs</i>				
First-time parents **	1.00	1.00	0.00	100
Existing parents who are pregnant again **	1.48	1.00	0.59	95.7
Pregnant teens **	1.00	1.00	0.00	100
Single parents **	1.04	1.00	0.21	100
Disadvantaged populations (e.g., low socio-economic status, ethnic minority, rural/remote, indigenous, those with drug/alcohol/domestic violence challenges) **	1.04	1.00	0.21	100
Same-sex couples **	1.04	1.00	0.21	100
Parents with trauma history	1.04	1.00	0.21	100
Parents expecting multiples	1.04	1.00	0.21	100
Parents who are adopting	1.09	1.00	0.29	100
Surrogacy parents (both birth mother and intended parents)	1.09	1.00	0.29	100
All primary support people	1.30	1.00	0.47	100
Existing parents who are pregnant again and who did not take classes with previous pregnancy/s	1.22	1.00	0.42	100
Non parents: birth professionals and educators	1.35	1.00	0.57	95.7
<i>Who should attend PPN parenting programs</i>				
Mum only **	4.43	5.00	0.95	91.3 (Disagree)
Dad only **	4.48	5.00	0.95	91.3

				(Disagree)
Both mum and dad/partner **	1.00	1.00	0.00	100
Extended family members who will be caregivers to the baby once born	1.83	2.00	0.72	91.3
Both mum and dad/partner with some sessions for dad/partner only **	1.65	2.00	0.75	95.0
<i>How information in PPN parenting programs can most effectively be presented/delivered</i>				
Experiential (e.g., practicing skills, modelling of skills, role-playing, parent's sharing experiences, discussions) **	1.35	1.00	0.71	95.7
Home practice activities to consolidate learning **	1.74	2.00	0.75	91.3
Standardised one-size-fits-all program **	4.26	4.00	0.62	91.3 (Disagree)
Multimedia environment (e.g., mix of lecture, video, group discussion, activities, self-reading, printed resources, take home tasks) **	1.17	1.00	0.39	100
The most effective platform for delivery of PPN parenting programs				
Sessions delivered via home visits **	1.87	2.00	0.69	91.3
Sessions delivered in community centres **	1.74	2.00	0.62	91.3
Who ought to deliver PPN parenting programs				
Midwife **	1.87	2.00	0.87	91.3
Childbirth educator **	1.35	1.00	0.57	95.7

** Item originated from the literature

Table 4

Examples of Items by Question that Did Not Attain Consensus Across Rounds 1 to 3

Question/Items	M	Mdn	SD	Consensus (%)
<i>Factors that may impact both the development of prenatates during gestation and influence who babies become post birth</i>				
Age of mother **	2.60	2.50	0.82	50.0
Ultrasound exposure	2.75	2.00	1.12	55.0
<i>Content perceived to be most effective regarding the needs of expecting parents when considering PPN parenting programs</i>				
Sleep training **	3.35	4.00	1.31	55.0 (Disagree)
How to influence gene expression of the baby in- utero **	2.75	3.00	1.02	35.0
Pregnancy, birth, and parenting as a spiritual experience	2.05	2.00	0.83	65.0
Current population trends in pregnancy, birth, and post birth health	2.90	3.00	1.02	40.0
<i>Content perceived to be ineffective regarding the needs of expectant parents when considering PPN parenting programs</i>				
Drug options for birth	3.45	4.00	1.32	65.0 (Disagree)
Sleep training	3.05	3.00	1.36	45.0 (Disagree)
Non-relevant birthing positions	2.65	3.00	1.04	45.0
Milestones that extend beyond three months post birth	3.10	3.00	1.07	45.0 (Disagree)

Content that is not contextualised for the father too	2.75	2.50	1.16	50.0
Immunisation	3.55	4.00	1.10	55.0 (Disagree)
Influence of gene expression	3.15	3.00	0.93	30.0 (Disagree)
<i>Current practices and/or theories that relate to conception, pregnancy, birth, and post birth that would be of value to educate pregnant couples on</i>				
Conscious conception	2.30	2.00	1.30	65.0
Somatic Experiencing	2.30	2.50	0.80	50.0
CBT for parenting	2.65	2.50	1.04	50.0
Social nervous system (as part of Porges’s Polyvagal Theory)	2.15	2.00	0.75	65.0
<i>Factors that may contribute to father/partner attending fewer pregnancy and parenting related sessions/programs than expectant mothers</i>				
Women feel comfortable talking to other women so need a women-only environment	2.65	2.00	1.04	60.0
<i>Who should attend PPN parenting programs</i>				
Siblings	2.25	2.00	0.85	70.0
<i>Stage of the pregnancy that may be the most effective time for parents to start in PPN parenting programs</i>				
No set time—when the parent/s are ready and motivated to attend prenatal classes/education sessions	2.80	2.50	1.32	50.0

Preconception	2.20	2.00	1.00	70.0
Trimester two	2.35	2.00	1.18	70.0
Trimester three	2.60	2.00	1.35	60.0
After quickening (when the mother perceives fetal movement)	2.80	2.50	1.24	50.0
After first ultrasound	3.05	3.00	1.19	45.0 (Disagree)
<i>The most effective time for PPN parenting programs to end</i>				
Before birth **	3.65	4.00	0.99	73.0 (Disagree)
Within three to six months post birth **	2.50	2.00	0.95	60.0
Within six to 12 months post birth **	2.60	2.00	1.23	55.0
<i>How information in PPN parenting programs can most effectively be presented / delivered</i>				
Lecture style **	3.15	3.00	1.09	45.0 (Disagree)
Manual/workbook **	2.85	3.00	0.93	45.0
<i>The most effective platform for delivery of PPN parenting programs</i>				
In-person group sessions in a hospital setting **	2.60	2.50	0.99	50.0
In-person couple session in a hospital setting **	2.70	2.50	1.08	50.0
Self-guided learning from home (e.g., with downloadable videos, worksheets, manual) **	2.60	2.00	0.88	55.0

'Live' webinar sessions that are interactive, where a parent can ask questions either verbally or by typing them, and contribute 'live' during the sessions **	2.35	2.00	0.88	70.0
Sessions delivered in the workplace **	3.20	3.00	1.06	45.0
Sessions delivered via phone, Skype, Zoom (or other similar platforms) **	2.70	3.00	0.80	40.0
<i>Who ought to deliver PPN parenting programs</i>				
OB/GYN **	3.25	3.00	1.16	45.0 (Disagree)
Nurse **	2.50	2.00	1.05	55.0
Psychologist, social worker, therapist, counselor, coach **	2.25	2.00	0.97	60.0
Academic researchers **	3.45	4.00	0.89	60.0 (Disagree)
Elders from the community **	2.90	3.00	0.97	45.0
Any facilitator, regardless of credentials, who has the right attitude (e.g., positive, empowering, open minded)	3.60	4.00	0.82	70.0 (Disagree)
<i>The most effective length of each session in PPN parenting programs</i>				
One hour	2.70	2.00	1.13	55.0
1.5 hours	2.55	2.00	1.05	55.0
Two hours	2.25	2.00	1.02	65.0
Half day	3.30	3.50	0.80	50.0 (Disagree)
Full day	3.35	4.00	0.99	55.0 (Disagree)

No set-time—course specific	2.65	3.00	1.04	45.0
<i>The most effective amount of time between each session</i>				
Two weeks	3.15	4.00	0.99	55.0 (Disagree)
<i>The most effective overall length of PPN parenting programs in time (e.g., number of weeks or months)</i>				
Six weeks	2.70	2.50	1.13	50.0
12 weeks	3.30	4.00	0.98	55.0 (Disagree)
No set time – it depends on the needs of the parents	2.25	2.00	0.79	65.0
From trimester one until three months post birth	2.35	2.00	0.93	65.0
From 12 months preconception until post birth	3.25	3.00	0.91	45.0 (Disagree)
From trimester two until three months post birth	3.30	4.00	0.92	55.0 (Disagree)

** Item originated from the literature

Discussion

The aim of the current study was to broaden understanding beyond what literature and expert parents (from the duplicate Delphi methodology study conducted as part of the PhD program of research) considered to be important and relevant factors for inclusion when designing, developing, and delivering effective PPN parenting programs for the 21st century. Items that reached consensus formulated recommendations for inclusion in PPN parenting programs of the future.

Factors that May Impact Prenates that Expecting Parents Would Benefit from Learning About

There was strong consistency between birth professional perceptions and the current research on factors perceived to influence a preborn during gestation that parents may benefit from being educated on (See

Table 3 above). The item “age of mother” did not achieve consensus, and in fact was only perceived to be an important factor on the development of prenatals during gestation and on babies post-birth, by 50% of the birth professional panelists. This was aligned with recent research (Dietl, Cupisti, Beckmann, Schwab, & Zollner, 2015), that is also inconsistent in findings and is polarized in views and outcomes. For example, a recent study suggested that the outcomes of pregnancy for infants born to women older than 40 years does not vary significantly from younger pregnant women, when: regular prenatal check-ups are attended, a healthy diet and exercise routine is followed by the mother throughout the pregnancy, and any pregnancy related medical issues such as gestational diabetes are managed medically (Dietl et al., 2015). In contrast to this, Kenny et al. (2013) found that adverse outcomes for babies, such as low birth weight, preterm birth, and even fetal death, exist for women aged over 40 years.

Of the panelist-generated items, examples of the most important, based on consensus percentages, include: (1) “social support available to the mother during pregnancy and beyond.” The literature has endorsed that women who have access to a wide and varied range of social support options (such as a partner, family members, and friends) are inclined to attend prenatal care early in a pregnancy (Rodrigo, Almeida, & Reichle, 2016). Social support has also been found to alleviate stress, anxiety, and depression throughout a pregnancy (Leung et al., 2017); (2) “social support available to the dad during the pregnancy and beyond.” Whilst social support has been dominantly researched from expecting mothers’ perspectives, Carlson, Edelson, & Kimball (2014) reported that, for first-time fathers, a lack of social support can be a contributing factor to challenging outcomes such as paternal anxiety, depression, and stress; (3) “love being expressed to the prenatel from conception onwards,” (e.g., via intentional communication from mothers and fathers). The impact of communicating (love) with prenatels directly through the time of pregnancy has not been directly or scientifically measured in existing literature; and (4) “epigenetics” and its effects during the prenatal time on the gene activity of developing prenatels (e.g., Anacker, O’Donnell, & Meaney 2014; Serpeloni et al., 2017).

Most Effective Content for Inclusion in PPN Pregnancy Programs

Consensus was reached on 92% of the 48 items rated (Table 3 above). “How to influence gene expression of the baby in-utero” remained non-consensual. While epigenetics in the context of PPN psychology is an emerging field (O’Donnell et al., 2014; Serpeloni et al., 2017), the average length of time the birth professional panelists had been active in the PPN field was 23.09 years. It was reasonable to presume that epigenetics was not part of curriculums for many, or all, of the panelists at the time of

studying and becoming licensed. It may be desirable to include a *content topic* of, “latest research trends” in future PPN parenting programs. Contrary to the literature (Landy, Jack, Wahoush, Sheehan, & MacMillan, 2012), the item “sleep training,” was not deemed as important content for inclusion in PPN parenting programs by the birth professional panelists. One possible explanation may be that because sleep training related to the time post-birth, it may not have been seen as critical content during the prenatal time-frame.

The panel also did not advocate for providing skills to parents on “pregnancy, birth, and parenting as a spiritual experience,” although there is research that supports this as a topic (Bennington, 2010; Johnson, 2001). Additionally, the item “current population trends in pregnancy, birth, and post birth health” was not seen as an important topic for expecting parents to be educated on. Two possible reasons for this include (a) that the birth professional panelists were largely from the USA only, so comparative world trends may not be known; and (b) the item statement was quite ambiguous, and as a result, panelists may simply not have known how to interpret what the statement meant, leading to a non-consensus outcome.

Ineffective Content for Inclusion in PPN Parenting Programs

Birth professionals did not advocate for any content that is “biased, judgmental, or has an agenda.” This applied to “ascribing to a particular model of birthing,” and “any content (regardless of topic) that may disempower either the mother or baby.” This was consistent with literature (Barrett et al., 2015; Bryson, 2013).

Current PPN Practices and Theories of Value to Include in Future PPN Parenting Programs

The most popular topics were “midwifery model of care” (Berg, Olafsdottir, & Lundgren, 2012), “sacred hour: skin-to-skin contact” (Essa & Ismail, 2015), “postpartum mood disorders” (Muller, Teismann, Havemann, Michalak, & Seehagen, 2013); “PPN psychology” (Chamberlain, 2013; Weinstein, 2016), “bonding and attachment theory” (Kluny, 2011), “consciousness of a pre-nate and neonate” (Chamberlain, 2013; Verny & Kelly, 1981); “epigenetics” (Anacker et al., 2014; Lipton, 2008; Serpeloni et al., 2017); “conscious parenting” (Chamberlain, 2013; Lipton, 2008); “mindfulness for parenting” (Hauck et al., 2016; Kluny & Dillard, 2014; Muller et al., 2013); and “neuroscience” in context of developing pre-nates and neonates (Siegel, 2011).

There were some inconsistencies between the literature and panelist findings. Specifically, the panelists did not reach consensus on five topics that the literature was supportive of: “conscious conception” (Chamberlain,

2013; Lipton, 2008), “bonding through meditation” (Duncan & Bardacke, 2010; Hauck et al., 2016; Vieten & Astin, 2008), “Somatic Experiencing” (Lovkvist, 2012), “CBT for parenting” (Field, Diego, Hernandez-Reif, Medina, Delgado, & Hernandez, 2012), and “understanding the social nervous system (as part of Porges’s Polyvagal Theory) when pregnant and post birth” (Porges, 2009; Porges & Furman, 2011).

Barriers to Fathers Attending PPN Parenting Programs

Barriers to fathers attending PPN parenting programs include: work schedules (Humphries & Nolan, 2015); PPN parenting service provision targeting content to mother and baby only (e.g., Carlson et al., 2014; Davis et al., 2016; Edvardsson et al., 2011); societal and cultural norms that favor pregnancy being a woman’s role (Alio et al., 2011; Davis et al., 2016); general lack of understanding of the importance of the role of the father in the wellbeing of the prenat (Bäckström et al., 2017; Salzmann-Erikson & Eriksson, 2013; Shribman & Billingham, 2008); and perception by birth professionals who facilitate classes that expecting fathers generally have a lack of desire to participate in classes (Humphries & Nolan, 2015; Shribman & Billingham, 2008); and lack of role identity by an expecting father (Alio et al., 2013).

Further research could be undertaken to explore specific ways that barriers to fathers attending PPN parenting sessions, as well as being involved during pregnancies from the earliest moments, could be overcome.

Logistical and Program Delivery-Related Factors that Are Most Effective for PPN Parenting Programs

Key sub-categories were explored.

Who should attend PPN parenting programs. The literature consistently supports that both mothers and fathers should be targeted to attend PPN parenting programs (e.g., Billingham, 2011; Feinberg, Roettger, Jones, Paul, & Kan, 2015), and that some sessions should be dedicated exclusively for mothers (Jongen et al., 2014), and others exclusively for fathers (Davis et al., 2016; Deslauriers et al., 2012) and the panelists concurred. Further, cohorts such as “first-time parents,” “teens,” “singles,” “same-sex parents,” and “adopting parents” were identified as target groups (Coley & Nichols, 2016; Feinberg et al., 2015). One anomaly was “siblings,” whereby the literature only supported the importance of knowing how to integrate siblings to the new family structure during pregnancy and beyond (Volling, 2012).

Stages of a pregnancy that are most effective for PPN parenting programs to start and end. A wide variation in both start and end times of PPN parenting programs has been reported in the literature with no consensus. This was matched by the panelists with the exception of “as soon as the couple discover they are pregnant;” however, no evidence-based studies were found to support this. One explanation may be that this non-specific timeframe would be difficult to measure in clinical studies. An opportunity exists for research to be conducted utilizing a consistent PPN parenting program as the independent variable measuring program effectiveness based on start time of the program, the dependent variable.

Effective delivery methods of PPN parenting programs. The most popular formats for delivery by the panelists were: “experiential options such as role playing, skill practice, and facilitator modeling of skills” (Dunneram & Jeewon, 2015; Lotrecchiano et al., 2013); “home-practice activities” (Bryson, 2013); and “individualised sessions where couples can select modules relevant to them as well as receive core modules” (Billingham, 2011; Quirk Owen, Inch, France, & Bergen, 2014).

Effective location/platform for delivery of PPN parenting programs. The literature endorsed four program delivery locations that panelists did not: “hospital settings” (Coley & Nichols, 2016), “online” (Cunningham, Lewis, Thomas, Grilo, & Ickovics, 2017; Gazmararian et al., 2014; Quirk et al., 2014), “within workplaces” (Sahip & Turan, 2007), and “self-guided home-based with downloadable worksheets and manual” (Petch, Halford, Creedy, & Gamble, 2012). One possibility for the polarized views may be that location of program facilitation was not perceived by birth professionals to be of particular importance for PPN parenting programs to be effective. One panel member stated that PPN parenting programs could be delivered in one or all of the locations identified as items for consensus rating, and each would *draw parents*.

Who ought to facilitate PPN parenting programs. The birth professional panelists reached consensus on six facilitator types that were supported by the literature: “midwives” (Dunneram & Jeewon, 2015; Nolan, 2017), “childbirth educators” (Coley & Nichols, 2016), “doulas” and “parents” (Nolan, 2017), “a collaboration of qualified individuals” (Feinberg et al., 2015), and “qualified people who are caring, non-judgmental, confident, engaging, approachable, and skilled” (Nolan, 2017). There was inconsistency between the panel and the literature for the item “anyone with skills to coach, offer support, encouragement, be culturally sensitive, and be passionate for material being presented” (Alalshaikh, 2015; Bryson, 2013). It may be that birth professionals

considered having credentials in pregnancy, birth, and post-birth care as important criteria to be eligible to facilitate programs.

Most effective length of each session, time between each session, and overall length of PPN parenting programs. The inability for agreement to be reached on ideal time frames across these topics was in alignment with the literature and suggests that session length and time between sessions were seemingly not considered to be critical factors for consideration when designing, developing, and delivering PPN parenting programs.

Limitations

Even though consensus was attained on 157 of the 242 items, the findings were restricted to the birth professional panelists included in the current study only, and may not be representative of birth professionals' views in general. Research has suggested that consensus findings from Delphi methodology studies do not lend themselves to being interpreted as the most accurate outcomes being found (Dawson et al., 2015; Hasson et al., 2000). This limitation was somewhat reduced by data being compared to the literature relating to design, development, and delivery factors relating to adult education in general, in the context of PPN parenting programs, and to a panel of expert parents in a second Delphi methodology study undertaken.

Recruitment of panelists involved a non-random sampling procedure, albeit in alignment with cited Delphi methodological practice (Dawson et al., 2015; Hasson et al., 2000), the representativeness of findings to a wider birth professional population was not assured. Also, as the sample was dominantly from the USA (unintentionally, as the recruitment advertisement was distributed on global social media), it remained an unknown as to whether the results found were valid for birth professionals from other nations, be it first-world or developing countries. This shortcoming is commonly reported for Delphi methodology studies (e.g., Desroches et al., 2015; Phillips et al., 2014).

Recommendations

The key recommendations are the same as those listed as consensus items from rounds one to three in Table 3 (above).

Implications for Practice and Research

Overall, results revealed 157 consensus-based items to be considered when designing, developing, and delivering future PPN parenting programs. The results from this study have been compared with those

found in a second Delphi methodology study that utilized the same procedure and questionnaires, using a panel of expert parents. Whilst comparing the findings is beyond the scope of this article, it is clear that future PPN parenting programs need to be based on current-time best-practice. Practical implications regarding: most-effective ways to modularize content to match stages of pregnancy, unique needs of expecting couples, needs of father; techniques for maintaining relevance and interest across all sessions of programs; and ensuring content is updated to include influential emerging fields, theories and science as evidence-based studies continue to transpire. Any programs developed need to be empirically measured (e.g., Ayiasi et al., 2013) using randomized clinical trials that include waitlists, control groups, and contrast treatments, for comparison.

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