

SHASTRI RESEARCH GRANT (SRG)
Final Report 2015-2016

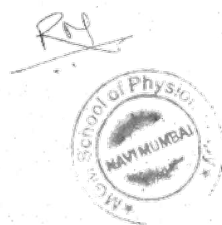
This report contains three sections, i.e. Section A, B and C.
 Section A is to be filled in by the Lead Applicant (and Co-Applicant).
 Section B and C are to be filled in by the Canadian and Indian Student/ Research Assistant respectively (when applicable).

SECTION: A

1	Name of Lead Applicant: Dr. Andrea Hommerich Telephone (land): 613-533-2648 Mobile: 613-301-6354 Fax: 613-533-6489 E-mail: andrea.hommerich@queensu.ca	Name of Co-Applicant: Dr. Nancy Fernandes Pereira Telephone (land): 91-022-22031879/22087422 Mobile: 9820524750 Fax: 22087422 E-mail: nancyfernandesltn64@gmail.com
	Name of Lead Applicant's Institution: Queen's University Mailing Address of Lead Institution: 130 Stuart St., Kingston, ON, K7L 3N6, Canada	Name of Co-Applicant's Institution: S.N.D.T. Women's University Mailing Address of Co-Applicant's Institution: Leelabai Thackersey College of Nursing, S.N.D.T. Women's University, New Marine Lines, Churchgate, Mumbai 400 020
2	Name of Canadian student or research assistant (if any): Ms. Emily Geens Name of the Institution: Queen's University Academic Level: Undergraduate Subject of Study: Kinesiology (continuing in Midwifery) Mailing Address : Kingston ON Telephone (land): Mobile: Fax: E-mail: 12elsg@queensu.ca	Name of Indian student or research assistant (if any): Ms. Shobha Gaikwad Name of the Institution: Leelabai Thackersey College of Nursing, S.N.D.T. Women's University, New Marine Lines, Churchgate, Mumbai 400 020 Academic Level: PhD Subject of Study: Labour comfort- Obstetric Nursing Mailing Address : Same as above Telephone (land): 91-022-22031879/22087422 Mobile: 9892130703 Fax: 22087422 E-mail: shobha.gaikwad14@gmail.com
3	Project Title: The effects of labour and birth positioning on pelvic dimension: gaining further insight to improve the birth experience	
4	Project Period: From: Jan 2016 To: Nov 2016	

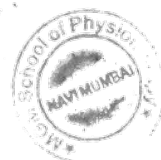


3	Project Title: The effects of labour and birth positioning on pelvic dimension: gaining further insight to improve the birth experience
4	Project Period: From: Jan 2016 To: Nov 2016
5	<p>a) Please give a brief summary of your project including key research questions.(300 words)</p> <p>Obstructed labour is a leading cause of maternal and newborn mortality. In India where maternal mortality rates are among the highest globally, squatting – a position shown to increase pelvic dimensions – is also more common during daily life. The primary objective of this project was to use a motion capture device to investigate the effects of birthing position on pelvic dimensions in a group of non-pregnant, Indian subjects. A secondary objective was to better understand rural Indian women's current experiences and aspirations around childbirth.</p> <p>A human motion analysis study conducted at the MGM Centre of Human Movement Science (India) will enable calculation of clinically-relevant pelvic dimensions from digitized landmarks using an optical motion capture system. Dynamic analysis of motion, including joint loading and muscle activity, will help explain pelvimetry findings. Three-dimensional positional information generated by the MRI will be used to validate the pelvimetry measurements from motion capture equipment in upright and supine positions.</p> <p>A field study in the rural community of Wauanje allowed investigators to gain insight into actual practices related to childbirth in rural India; women who had recently given birth and obstetrics care providers within the community were asked to guide us through their birth experiences.</p> <p>b) Please describe the major findings-results. (350 words)</p> <p>A) Human motion analysis</p> <p>Magnetic resonance imaging (MRI) data were collected from three participants at Queen's University's MRI Facility. MRI measurements have demonstrated an increase in all pelvic dimensions in the kneel-squat position (used to simulate an upright birth posture) when compared with supine. The largest increase in the sagittal plane was the anteroposterior outlet (0.45 cm) and in the transverse plane the bituberous diameter (0.25 cm).</p> <p>Analysis of laboratory digitizing trials from which pelvimetry measurements are estimated must be further refined to improve accuracy in all positions. Data from three participants demonstrate the greatest consistency between MRI and laboratory measurements in the standing and lithotomy positions.</p> <p>Preliminary results from motion trials show substantial hip and lumbosacral joint extension moments in squatting (greater than 100 Nm and 60 Nm, respectively), while a flexion moment is exhibited at the lumbosacral joint in the all-fours position. Such moments could potentially open the pelvic outlet in squatting while increasing the inlet anteroposterior diameter in all-fours. Further analysis is required to evaluate forces acting on the pelvis in the supine position.</p> <p>Laboratory digitizing and motion analysis data have been collected from 30 participants to date.</p> <p>B) Perceptions of childbirth in a rural Indian community</p> <p>Interviews were conducted with five healthcare personnel -- including one auxiliary nurse midwife (ANM) and four accredited social health activists (ASHA workers) -- as well as seven mothers in Wauanje village's community centre. Mothers generally described pleasant experiences; the ANM with over 30 years of experience and ASHA workers described normal deliveries without complications and were confident with their skills. Delivery positions were always supine (lying on their backs); neither care providers nor women were aware of other methods of delivery. A tour of the primary health sub-centre in the village revealed sparse surroundings with only the bare minimum in medical technology resources. Only one labour room and one small delivery room having two beds was available for a community serving approximately 4000 people. Pharmacological pain medication is not available at the sub-centre and women have very little space to move around once inside the facility. Instrumental deliveries, including caesarean section, were not conducted at the sub-centre, but rather at the tertiary care facility, MGM Hospital, Kalamboli, located half an hour away from the village.</p> <p>c) How did you measure the results? (250 words)</p> <p>A) MR images were acquired using a 3-Tesla Siemens scanner from each subject in two positions: kneel-squat (yoga child's pose) and supine. Images were segmented and 3D reconstructed using Mimics software. Clinically</p>



	Number of Canadian faculty members visiting to India	1 Postdoctoral fellow, (1 faculty member's visit was supported by a separate grant)
	Number of Indian faculty members visiting to Canada	0
	Number of Canadian and Indian students or research assistants involved in your project (if any)	1 Canadian, 4 Indian
	Number of Canadian students visiting India (if any)	0
	Number of Indian student visiting Canada (if any)	0
8	What are your plans for your institutions' future research collaboration based on the activities completed under this project? Further addressing maternal health through women's empowerment, for example, introducing women to squatting position during delivery in rural Indian community (teach and facilitate delivery in squatting position).	
9	What other research collaboration activities are being planned by your institution over the coming 12 to 18 months? 1. Further qualitative field work. Possibilities include: - interviewing Indian women and care providers who have experienced complications during childbirth that occur more commonly in India; - comparison with Canadian women's experiences; - comparative study of birthing experience among two different economic strata. 2. Refinement of quantitative analysis methods; finalizing analyses of quantitative data.	
10	Please describe how dissemination of project information and showcasing of research/project results are done at various levels throughout the project period. (400 words) Local (Canada) - presentations at Queen's University, Ottawa Birth and Wellness Centre; Local (India): - Wauanje Community Centre; plan to conduct a workshop to disseminate the findings to health care providers so that it can be incorporated into practice. - Presentations and discussions with students at SNTD Women's University and MGM Institute of Health Sciences about the research. International - ISB2017 conference, peer-reviewed journals (not during project period).	
11	Is there any success stories with your research/project that you would like to share? Please attach relevant photographs. The seed for this project was initially planted before the birth of my daughter while considering the link between various cultural birthing practices and biomechanical benefits to maternal health. Including the qualitative research component to ensure the relevance and long-term impact of the overall project was crucial. The three-way collaboration between Nancy Fernandes Perelra (SNTD University), Rajani Mullerpatan (MGM Inst of Health Sciences), and my postdoctoral supervisor and I at Queen's University was actualized through the Shastri Research Grant. Travelling to India to meet with my collaborators solidified our mutual understanding of goals and strategies and allowed me to better understand the context of our work. This collaboration was further enhanced through new relationships developed with students and colleagues of the primary collaborators, which will -- undoubtedly! -- pave the way for future research together. - Andrea Hemmerich, August 2016 (Photograph of collaborators prior to Wauanje village visit in April is attached.)	
12	Were there any reports, publications or other educational materials produced as a result of the project? If so, please attach a copy of these documents to your report (Please note that the Institute reserves the right to use relevant information from those documents in its public communication without any further consultation) SNTD report (attached); Conference and journal publications for both qualitative and quantitative parts of the study are anticipated.	

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13	<p>Please attach 2-3 high resolution digital photographs from your SRG project that could be featured in the Shastri Institute's public communication (i.e., annual report, newsletters, etc.)</p> <p>Photos attached: Yes: Yes</p>
14	<p>Please provide a quote based on the experience of your SRG project work that could be used by the Institute for the above purposes.</p> <p>Simplicity of expectation and experience of birthing: a natural process (as viewed by women in rural India).</p> <p>The SRG provided an opportunity for both Canadian and Indian researchers to understand women's birthing experiences from a cultural and biomechanical perspective.</p>
15	<p>Please note the following for your Financial Reporting:</p> <ul style="list-style-type: none"> - Fill in and attach the financial report form available on the website. - Submit scanned copies of all invoices and proof of payments to support your financial report.
16	Signatures
<p>Signature of Lead Applicant</p> <p><i>A. K. Kulkarni</i></p>	
<p>Signature of Co-Applicant</p> <p><i>R. M. Kulkarni</i></p>	
<p>Date: 07 DEC 2016.</p>	<p>Date: 07 Dec 2016</p>

