Institution: Buckinghamshire New University

Unit of Assessment: 3 - Allied Health Professions, Dentistry, Nursing and Pharmacy

Title of case study: Birth Satisfaction Scale-Revised: A globally-endorsed measure of birth experience

Period when the underpinning research was undertaken:

Details of staff conducting the underpinning research from the submitting unit:

Name(s):	**Role(s) (e.g. job title):**	**Period(s) employed by submitting HEI:**
Prof Colin Martin	Professor of Mental Health Nursing	1/2/13 to 31/3/18

Period when the claimed impact occurred: 1 August 2013 to December 2020

Is this case study continued from a case study submitted in 2014? N

1. Summary of the impact (indicative maximum 100 words)

The *10-item Birth-Satisfaction-Scale-Revised (BSS-R)* is a psychometrically valid and reliable birth satisfaction measure developed by Professor Martin. It has become the 'gold standard' measure of birth experience, evidenced by expert consensus selection of the measure as the key index of birth experience in the *International Consortium for Health Outcome Measures (ICHOM) Pregnancy and Childbirth Standard Set*. Widely translated and in use in over 30 countries, the BSS-R has been utilised by both researchers and clinicians alike. Currently, over 100 investigations are underway using the BSS-R with 18 studies thus far reporting findings.

2. Underpinning research (indicative maximum 500 words)

Development of the *BSS-R* was undertaken by Professor Martin during his tenure at Buckinghamshire New University (BNU), the selection of the *BSS-R* by ICHOM for the *Pregnancy and Childbirth Standard Set* also occurring during his employment at BNU. Derived from a thematic review of the literature and an exhaustive psychometric process to select the best performing items from a long-form version (BSS), the *BSS-R* measures three thematically- and congruent domains of birth satisfaction, these being:

(1) Quality of care provision (birth environment, sufficient support, relationships with health care professionals) (4-items).
(2) Personal attributes (ability to cope during labour, feeling in control) (2-items).
(3) Stress experienced during labour (obstetric injuries, long labour, distress experienced during labour) (4-items).

Adopting a step-wise approach to optimal item selection for the *BSS-R* [3.1] including factor analysis, structural equation modelling and established psychometric evaluative procedures including known-groups, divergent and convergent validity analysis and internal consistency estimation, the key measurement parameters of the *BSS-R* were established and found to be a robust and reliable.

The *BSS-R* provides a theoretically aligned and measurement credible tool to assess the birth experience and identify within the clinical environment areas for improvement and optimisation in addition to providing clinically-valuable insights into the impact of specific clinical interventions on birth experience, for example intervention delivery compared to spontaneous vertex delivery [3.1].

A United States-specific version of the *BSS-R* was developed and found to be equivalent to the original UK version in a large sample (N>2000) [3.2]. Similarly, the Australian version of the *BSS-R* was found to have exemplary measurement characteristics and equivalence to the original [3.3]. The utility and flexibility of the *BSS-R* to specific clinical and/or research context has also been demonstrated in a study demonstrating the robustness and appropriateness of alternative scoring approaches [3.4].

Professor Martin continues to work on developing the *BSS-R* for innovative application in diverse clinical and research context including the development of non-English language versions, for example, the Spanish version [3.5]. The clinical impact of the *BSS-R* continues to gather ground, for example the *BSS-R* has recently been used in the National Maternity Survey in the UK, the use of which has provided new insights into the experience and prediction of post-traumatic stress following childbirth [3.6].
This systematic approach to the development of the *BSS-R*© has facilitated clinical teams Internationally to translate valid versions of the measure for measuring clinical outcomes and optimising evidenced-based maternity care provision.

3. References to the research (indicative maximum of six references)

3.1. Hollins Martin, C. J., & Martin, C. R. (2014). Development and psychometric properties of the Birth Satisfaction Scale-Revised (BSS-R). *Midwifery, 30*(6), 610-619. doi:10.1016/j.midw.2013.10.006

3.2. Martin, C. R., Hollins Martin, C. J., Burduli, E., Barbosa-Leiker, C., Donovan-Batson, C., & Fleming, S. E. (2017). Measurement and structural invariance of the US version of the Birth Satisfaction Scale-Revised (BSS-R) in a large sample. *Women and Birth, 30*(4), e172-e178. doi:10.1016/j.wombi.2016.11.006

3.3. Jefford, E., Hollins Martin, C. J., & Martin, C. R. (2018). Development and validation of the Australian version of the Birth Satisfaction Scale-Revised (BSS-R). *Journal of Reproductive and Infant Psychology, 36*(1), 42-58. doi:10.1080/02646838.2017.1396302

3.4. Martin, C. R., Hollins Martin, C. J., Burduli, E., Barbosa-Leiker, C., Donovan-Batson, C., & Fleming, S. E. (2018). The Birth Satisfaction Scale - Revised (BSS-R): should the subscale scores or the total score be used? *Journal of Reproductive and Infant Psychology*, 1-6. doi:10.1080/02646838.2018.1490498

3.5. Romero-Gonzalez, B., Peralta-Ramirez, M. I., Caparros-Gonzalez, R. A., Cambil-Ledesma, A., Hollins Martin, C. J., & Martin, C. R. (2019). Spanish validation and factor structure of the Birth Satisfaction Scale-Revised (BSS-R). *Midwifery, 70*, 31-37. doi:10.1016/j.midw.2018.12.009

3.6 Harrison, S. E., Ayers, S., Quigley, M. A., Stein, A., & Alderdice, F. (2021). Prevalence and factors associated with postpartum posttraumatic stress in a population-based maternity survey in England. *Journal of Affective Disorders, 279*, 749-756. doi:10.1016/j.jad.2020.11.102

4. Details of the impact (indicative maximum 750 words)

Following development, the *BSS-R* was evaluated for potential inclusion in the (then) forthcoming *ICHOM Pregnancy and Childbirth Standard Set.* The measure was selected for inclusion in the standard set as the key index of birth experience [5.1], indeed, the *BSS-R* being the only self-report outcome measure in the set to receive 100% expert consensus endorsement [5.2]. Following ICHOM inclusion, the measure has been used in over 30 countries and across over 100 sites to foster and evaluate evidence-based maternity care. Inclusion of the *BSS-R* into medical data models has also been supported within the pan-European context through WWU Munster based in Germany (https://medical-data-models.org/29452)

Further evidence of both impact and innovation in the use of the *BSS-R* can be found in the development of a 6-item short-form version, *BSS-R Indicator (BSS-RI)* [5.3] which formed an integral part of the 2015 National Maternity Survey (NMS) for England and Wales[5.4] to measure women's satisfaction with maternity services. Successful application of the *BSS-RI* in the 2015 NMS led to the adoption of the *BSS-R* in the 2018 National maternity care report[5.5].

Following inclusion in the ICHOM Pregnancy and Childbirth Standard Set [5.1], numerous translation/validation studies have been conducted and published including the United States, Greek, Australian, Turkish, Spanish, Israeli, Italian and Iranian versions. Many more *BSS-R* translation and validation studies are currently underway. A summary of the 30 countries (100 sites) that have or are currently using the *BSS-R* is available for review from Professor Martin [5.6].

In addition to translation/validation, numerous examples of *BSS-R* impact exist including:

- Evaluation of birth satisfaction (using the *BSS-R*) in relation to stress, anxiety, control and breast-feeding self-efficacy.[5.7]
- A systematic review[5.8] reporting the *BSS-R* is not only valid, reliable and easy to administer, but has the longest reliable recall of any birth satisfaction measure.
- Application as a key outcome measure in a large randomised-controlled multi-site trial in Sweden to assess women's intranatal satisfaction at 2-months post having a lateral episiotomy or no episiotomy [5.9].
- Application as a key outcome measure in a large randomised-controlled multi-site trial in Australia to assess women's satisfaction following fetal electrotocardiogram on emergency c [5.9].
- Use as an index of quality of care and birth experience in evaluation of technical clinical innovation and intervention to predict Cesarean section risk and reduce maternal morbidity [5.10].

- Haifaa Almalki who works for the Ministry of Health in Saudi Arabia has applied use of the BSS-R across all of the delivery suites in Saudi Arabia for purpose of improving standards of intranatal care (commenced 2019).

5. Sources to corroborate the impact (indicative maximum of 10 references)

5.1. The International Consortium for Health Outcome Measurement. (2016). *Pregnancy and Childbirth Standard Set and Reference Guide*. Retrieved from http://www.ichom.org/medical-conditions/pregnancy-and-childbirth/

5.2. Nijagal, M. A., Wissig, S., Stowell, C., Olson, E., Amer-Wahlin, I., Bonsel, G., . . . Franx, A. (2018). Standardized outcome measures for pregnancy and childbirth, an ICHOM proposal. *BMC Health Serv Res, 18*(1), 953. doi:10.1186/s12913-018-3732-3

5.3. Martin, C. R., Hollins Martin, C., & Redshaw, M. (2017). The Birth Satisfaction Scale-Revised Indicator (BSS-RI). *BMC Pregnancy Childbirth, 17*(1), 277. doi:10.1186/s12884-017-1459-5

5.4. Care Quality Commission (2015). *Survey of Women's Experience of Maternity Care. Statistical Release*. London: CQC.

5.5. Harrison, S., Alderdice, F., Henderson, J., Quigley, M.A. (2020). You and Your Baby: A national survey of health and care. National Perinatal Epidemiology Unit, University of Oxford, Oxford. ISBN: 978-0-9956854-5-1.

5.6. Countries and numbers of sites using the *10-item-Birth-Satisfaction-Scale* (BSS-R) from 2015 onwards. Information retained by Professor Colin R. Martin

5.7. Hinic, K. (2017). Understanding and Promoting Birth Satisfaction in New Mothers. *MCN Am J Matern Child Nurs, 42*(4), 210-215. doi:10.1097/NMC.0000000000000345

5.8. Alfaro Blazquez, R., Corchon, S., & Ferrer Ferrandiz, E. (2017). Validity of instruments for measuring the satisfaction of a woman and her partner with care received during labour and childbirth: Systematic review. *Midwifery, 55*, 103-112. doi:10.1016/j.midw.2017.09.014

5.9. Bergendahl, S., Ankarcrona, V., Leijonhufvud, Å., Hesselman, S., Karlström, S., Kopp Kallner, H., & Brismar Wendel, S. (2019). Lateral episiotomy versus no episiotomy to reduce obstetric anal sphincter injury in vacuum-assisted delivery in nulliparous women: study protocol on a randomised controlled trial. *BMJ Open, 9*(:e025050). doi:doi:10.1136/bmjopen-2018-025050

5.10. Hamm, R. F., McCoy, J., Oladuja, A., Bogner, H. R., Elovitz, M. A., Morales, K. H., . . . Levine, L. D. (2020). Maternal Morbidity and Birth Satisfaction After Implementation of a Validated Calculator to Predict Cesarean Delivery During Labor Induction. *JAMA Network Open, 3*(11), e2025582. doi:10.1001/jamanetworkopen.2020.25582