

Abstract

# Human Milk Expression Technologies: An Evaluation of Mobility and Comfort Perception of a Hands-Free, In-Bra, Breastmilk Collection Pump Set <sup>†</sup>

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Wearable pumps have been designed to improve convenience and maximize flexibility whilst pumping and are reported to benefit lactating health professionals when they return to work [1]. However, their performance in regard to efficacy, comfort and ease of use is rarely evaluated. One recent study reported on the efficacy and comfort of an experimental hands-free, in-bra, breastmilk collection pump set (IBCPS) connected to a personal use double electric breast pump [2], now available as a Freestyle Hands-Free Breast Pump. Applying the IBCPS resulted in efficient and effective breast emptying with good comfort ratings. We present a further evaluation of its mobility, convenience, and ease of use as rated by participants. Twenty-three lactating mothers 1–6 months postpartum participated in this cross-sectional study. Mothers completed one pumping session with IBCPS where both breasts were pumped simultaneously using the participant's maximum comfortable vacuum for a period of 15 min of expression after the first milk ejection. Mobility testing was conducted throughout a series of positions (whilst walking, reaching up with arms stretched, and leaning over) during the expression phase of pumping, and participant satisfaction and confidence, and comparison to home pump questionnaires were completed. A scale from 1 to 5 was used to rate the participants' degrees of comfort, confidence, satisfaction and ease of use, general pumping experience and likelihood of multitasking when using the pump. A rating of 1 indicated very comfortable, confident, satisfied, very easy to use, very good and very likely; and 5 indicated very uncomfortable, absolutely not confident, very unsatisfied, very difficult to use, very bad and very unlikely. The results are presented as mean and standard deviation values and minimum–maximum values, which generally were between 1 and 3, unless specifically reported. During the pumping session, the mean initial, mid pumping and final comfort levels were  $1.9 \pm 0.6$ ,  $1.8 \pm 0.7$  and  $1.9 \pm 0.8$ , respectively [2]. Mothers' confidence in pumping while walking was  $1.4 \pm 0.6$ ,  $1.5 \pm 0.7$  for reaching up, and  $1.9 \pm 1.0$  (1–4) for leaning over. Satisfaction with the amount of expressed milk was  $1.9 \pm 1.2$ , with comfort  $1.4 \pm 0.6$ , with collection pump set fit in the bra  $1.7 \pm 0.7$ , with the bra shape with pump set in it  $1.5 \pm 0.8$ , with pump set weight in the bra  $1.0 \pm 0.2$  (1–2) and with applied vacuum  $1.4 \pm 0.7$ . Mothers found the IBCPS easy to use, to connect and place in the bra ( $1.9 \pm 0.9$  (1–4)), to align the nipple ( $1.7 \pm 0.8$ ), to remove the pump set from the bra ( $1.6 \pm 0.7$ ) and to pour milk from pump set into the bottle ( $1.4 \pm 0.6$ ). The mothers rated overall pumping experiences with IBCPS as very good ( $1.4 \pm 0.5$  (1–2)) and indicated that they would be very likely to multitask



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when using the IBCPS ( $1.4 \pm 0.6$ ). When comparing the IBCPS to their home pumps, the mothers liked IBCPS more ( $1.4 \pm 0.7$ ) and rated it as more effective ( $2.2 \pm 1.1$  (1–5)), more comfortable ( $2.0 \pm 0.9$  (1–4)) and generally better than their home pumps ( $2.1 \pm 1.0$  (1–4)). Overall, the mothers rated pumping experience with IBCPS as satisfactory, comfortable or better and they found the pump easy to use and liked the hands-free aspect and the mobility. These findings further support the use of wearable pumps to allow for maximal flexibility for mothers that wish to combine their lactation and career goals.

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