




Abstract

A Comparison of the Efficacy and Comfort of Traditional and a Hands-Free, In-Bra Breastmilk Collection Pump Sets [†]

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Breastfeeding women who pump their milk report that pumping is time-consuming [1] and interferes with mothering and other activities [2], and so there is high interest in effective wearable pumps. A 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 (Freestyle), now available as the Freestyle Hands-Free Breast Pump [3]. Applying the IBCPS resulted in efficient and effective breast emptying with good comfort ratings. However, the performances of these two pump sets regarding efficacy, comfort, and pumping experience were not compared. This study focused on the data from a subset of participants that also completed the reference (Freestyle with a traditional shield) pumping session.

Twenty-one lactating mothers 1–6 months postpartum completed two pumping sessions with Freestyle, one using a traditional shield pump set and one with IBCPS. During the sessions, both breasts were pumped simultaneously ($n = 42$ sessions) using the participant's maximum comfortable vacuum for a period of 15 min of expression after the first milk ejection. Milk output was measured together with time to milk ejection and maternal comfort. A scale from 1 to 5 was used to rate participants' degrees of comfort and pumping experience perception in comparison with mothers' home pumps. A rating of 1 indicated (a) very comfortable and (b) much more comfortable, much more effective, much more likable, and much better compared with their home pump. A rating of 5 indicated (a) very uncomfortable and (b) much more uncomfortable, much more ineffective, much more unlikable, and much worse compared with their home pump. Mothers completed a 24 h milk production profile to allow the percentage of available milk removed to be calculated. Statistical analysis used linear mixed modelling accounting for degree of fullness of the breast pre-pumping, session, and a random effect of mother.

There was no significant difference between the two test conditions for volume of milk removed (IBCPS: 69 ± 39 g; Traditional: 69 ± 39 g), degree of fullness of the breast post-expression (IBCPS: 0.08 ± 0.13 ; Traditional: 0.08 ± 0.13), and percentage of available milk removed (IBCPS: $80 \pm 57\%$; Traditional: $73 \pm 28\%$). No significant difference in milk removal rate was seen (IBCPS: 4.7 ± 2.5 g/min; Traditional: 4.6 ± 2.7 g/min). However, time to milk ejection (by observation) was significantly shorter with IBCPS (IBCPS: 0.89 ± 0.28 min; Traditional: 1.25 ± 0.68 min, $p = 0.002$). Further, no significant differences were seen in nipple temperature changes (from pre- to post-pumping, IBCPS: -0.5 ± 1.1 °C; Traditional: -1.0 ± 1.1 °C), and initial comfort (IBCPS: 1.9 ± 0.6 ; Traditional: 2.1 ± 0.9),



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mid-pumping comfort (IBCPS: 1.9 ± 0.7 ; Traditional: 1.8 ± 0.7), and final comfort (IBCPS: 1.9 ± 0.9 ; Traditional: 1.8 ± 0.7) during sessions. Mothers had positive comments for IBCPS in general and compared with their home pumps. Most mothers found Freestyle with IBCPS to be more comfortable compared with their home pumps (IBCPS: 2.1 ± 0.9 ; Traditional: 2.8 ± 0.8 , $p < 0.001$), though they did not rate it as effective as Freestyle with traditional shields (IBCPS: 2.3 ± 1.1 ; Traditional: 2.1 ± 0.9 , $p < 0.001$). Mothers liked the in-bra, hands-free aspect better than the traditional (IBCPS: 1.4 ± 0.7 ; Traditional: 2.4 ± 0.9 , $p < 0.001$) but did not think IBCPS was generally better than the Traditional pump set (IBCPS: 2.2 ± 1.0 ; Traditional: 2.6 ± 0.8) when compared to their home pumps.

Use of the IBCPS resulted in efficient and effective breast emptying without compromise in comfort. Mothers rated the IBCPS experience as comfortable and liked the in-bra, hands-free aspect and associated mobility. These findings indicate that use of effective and comfortable wearable pumps may assist women in supporting lactation while meeting their personal and career goals.

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