

## “Transforming Elderly Care: A Comparative Analysis of Physical Care Burden on Formal Caregivers”

As the global population continues to age at an unprecedented rate, the demand for formal caregivers is reaching critical levels. The shortage of caregivers, a challenge faced by countries worldwide, poses a threat to the quality of care provided to the elderly. This scarcity not only results in increased care costs but also contributes to the physical burden experienced by caregivers. In response to this growing concern, a recent study conducted as part of the Translational Research Program for Care Robots, funded by the Ministry of Health & Welfare, Republic of Korea, sought to explore innovative solutions to alleviate the strain on formal caregivers.

The study focused on quantitatively comparing the physical burden on caregivers during excretion care (EC) when using traditional manual care (MC) with a paper diaper versus robot-aided care (RC). Ten formal caregivers participated voluntarily, and the experiment took place in a smart care space, where tasks were structured, phased, and classified according to characteristics. The robot-aided care utilized in this study is a Complete Intelligent Toileting System (name: Carebidet).

Manual excretion care using a paper diaper was found to be physically demanding, leading to musculoskeletal pain and physical fatigue among caregivers due to repeated assistance required by care receivers. The experiment revealed that robot-aided care (RC) significantly reduced caregivers' physical load, particularly during front tasks.



The findings emphasize the potential benefits of implementing and promoting the use of care robots to fulfill formal caregiving needs. For a patient wearing the Carebidet, built-in sensors detect waste, flush, rinse and air-dry ensuring comfort and cleanliness for the individual.

The study suggested that a care robot assisting with excretion care could not only reduce nurses' workload but also enhance the overall quality of nursing care. Additionally, the study compared the time and burden savings between manual care (MC) and robot-aided care (RC) for one round of excretion care.



The key findings of this study were:

1. **Time Savings:** The study found that the total caregiver time required for a full day's use of the Carebidet is equivalent to the time for 2.97 diaper changes. This translates to a 50% time savings if performing 6 diaper changes a day and a 63% time savings for the recommended 8 changes per day.
2. **Cumulative Care Burden Reduction:** The analysis showed a 39% reduction in cumulative care burden if performing 6 diaper changes a day and a 54.2% reduction if following the medically recommended 8 changes per day.

The financial impact of saving this much time for toileting care is dramatic, as are the additional benefits and savings in the bigger picture:

The net savings per year per Bed/Carebidet were calculated, showing substantial potential savings:

- Net Savings per Year per Bed/Carebidet: \$13,256
- Net Savings per Year per Bed/Carebidet @ 25 Beds/Carebidets: \$331,400
- Net Savings per Year per Bed/Carebidet @ 50 Beds/Carebidets: \$662,800

Caregivers 'get back' more time or, reduce professional caregiver costs, by reducing the time involved in monitoring and changing diapers, or being called to do a bedpan care, including cleaning the mess and changing the sheets.

This study provides valuable insights into the transformative impact of care robots on the physical burden of formal caregivers, offering substantial time and cost savings. The implementation of robot-aided care, such as the Carebidet, not only enhances the efficiency of care provision but also contributes to the overall well-being and comfort of elderly individuals. As societies worldwide grapple with the challenges of an aging population, embracing innovative solutions like care robots becomes imperative for sustaining high-quality elderly care.

Improving personal hygiene for the patient is critically important for keeping them comfortable and avoiding potential infections. Carebidet helps reduce fungal infections, or any lesions or sores on the skin through prompt excrement disposal and the wash/air-dry feature. This helps prevent bladder infections and/or urinary tract infection often caused by use of paper diapers. It can also help relieve constipation, fecal incontinence and prevents possible falls while getting up and trying to go to the bathroom at night.

Comfortable, cost-effective and easy-to-use, the Carebidet decreases the burden on family and caregivers, healthcare costs, CO<sub>2</sub>, waste, paper diapers, odor, worries, stress, and delays.

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