

The Effects of Warm Water Footbath with Lavender Essential Oil on Sleep and Comfort in Ventilator-Dependent Patients: A Randomized Clinical Trial

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Introduction and objectives

- Patients who are respirator-dependent often experience pain, difficulty breathing, anxiety, fear, and sadness, resulting in discomfort and sleep disturbances during the recovery process.
- Institutions often focus on respirator-dependent patients who are successfully weaned from the respirator but ignore the patient's sleep problems and comfort.
- There is no literature on the effectiveness of lavender essential oil warm water footbath for these patients.
- Objectives: To verify the **sleep** and **comfort** effects of respirator-dependent patients whether or not they receive a lavender essential oil warm water footbath.

METHODS

- Design: A **two-group crossover design trial** and blocks randomly assigned groups after gender stratification.
- Intervention: The **experimental group** first received a footbath with lavender essential oil at 41-42°C warm water for 20 minutes for 3 days, then rested for 3 days, and then received routine care for 3 days; the **control group** first received routine care for 3 days, then rested for 3 days, and then received lavender essential oil 41-42°C warm water footbath for 20 minutes for 3 days.
- Instruments: The **Richards-Campbell Sleep Questionnaire (RCSQ)** and the **Numerical Rating of Comfort (NRC)**.
- Data analysis: Descriptive statistics, χ^2 and Fisher's exact tests, unpaired t tests, and repeated measures ANOVA of inferential statistics.

RESULTS

- Regardless of Intention-to-Treat (ITT) (n = 94) or Per-protocol (n = 93) analysis, in terms of **between-group effects**, all subjects significantly improved sleep quality and increased comfort after receiving lavender essential oil warm water footbaths. There were significant differences in sleep quality between T3 and T4, and there were also significant differences in comfort levels between T2, T3, and T4 (Figure 1-3).
- In terms of **within-group effects**, all subjects significantly improved their sleep quality and comfort level after receiving lavender essential oil warm water footbath, and the overall self-rated sleep quality and comfort level were at T2, T3, T4 and T6, T7. T8 is significantly higher than T1 or T5. In terms of the nursing staff's evaluation of the subjects' sleep quality, the subjects' sleep quality significantly improved after receiving a warm water footbath with lavender essential oil, and the sleep quality at T2, T3, and T7. T8 was significantly higher than that at T1 or T6 (Figure 1-3).
- In terms of **within-group and between-group interaction effects**, overall subjects had significant within-group and between-group interaction effects on sleep quality and comfort after receiving a lavender essential oil warm water footbath, and the overall self-rated sleep quality was at T2, T3, T4, T6, T7, and T8 were significantly higher than T1, and the overall self-rated comfort was significantly higher than T1 or T5 at T2, T3, T4, T7, and T8 (Figure 1-3).

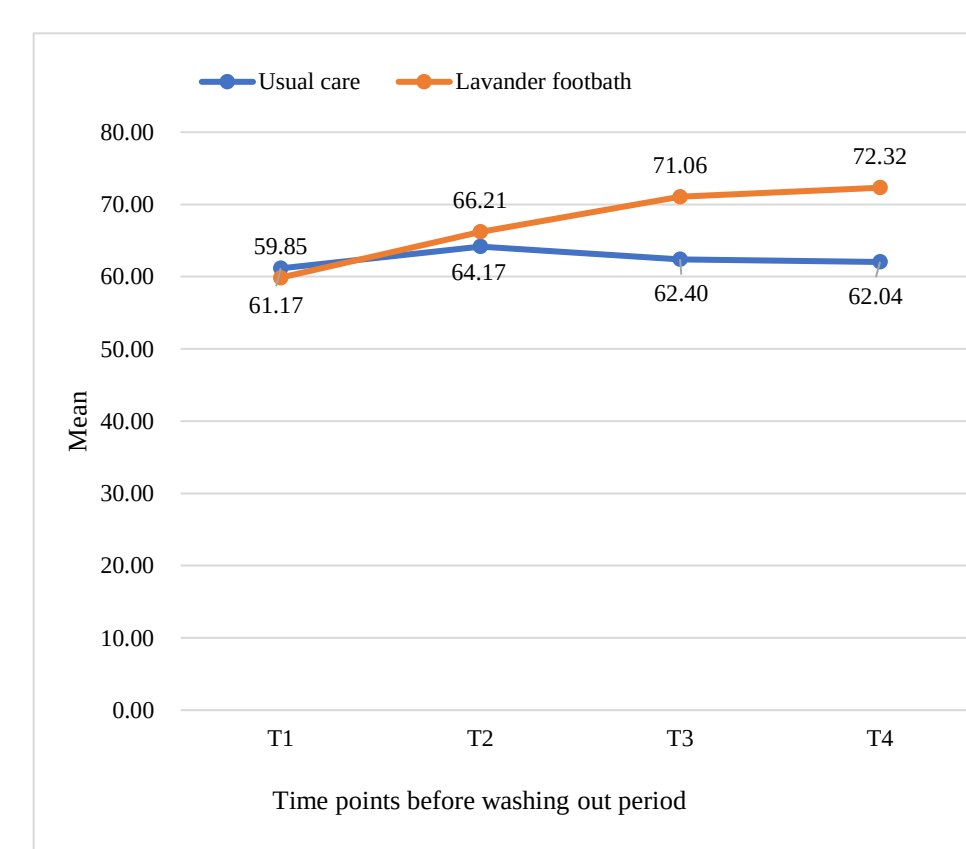


Figure 1 Self-rated sleep quality before and after washing out period

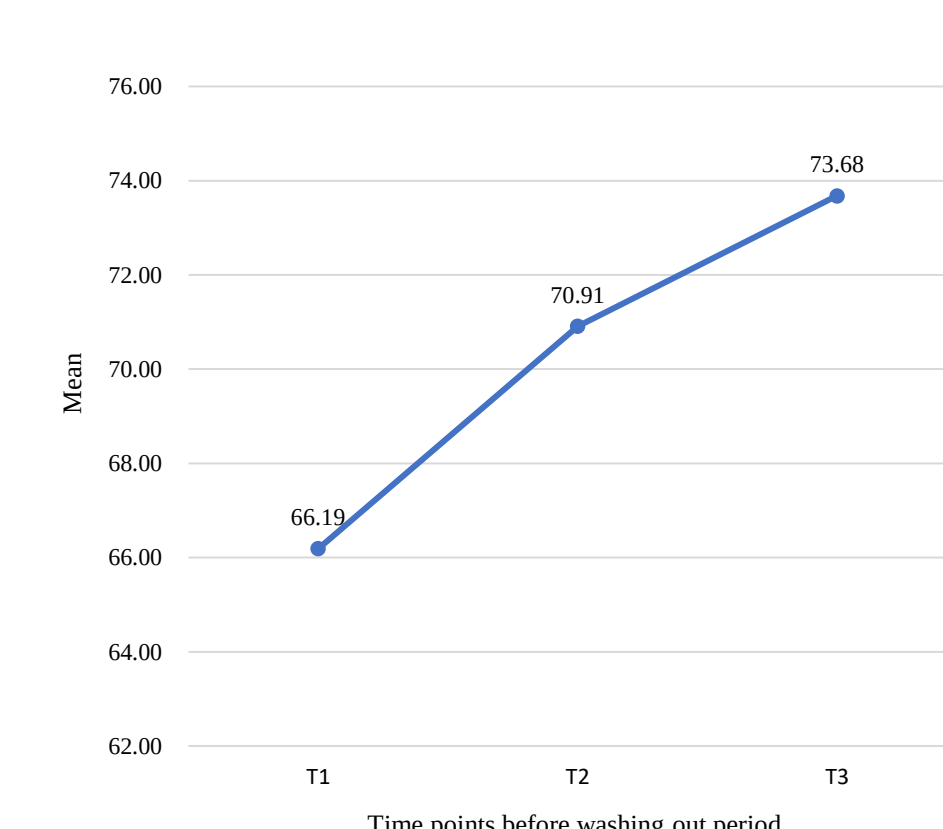
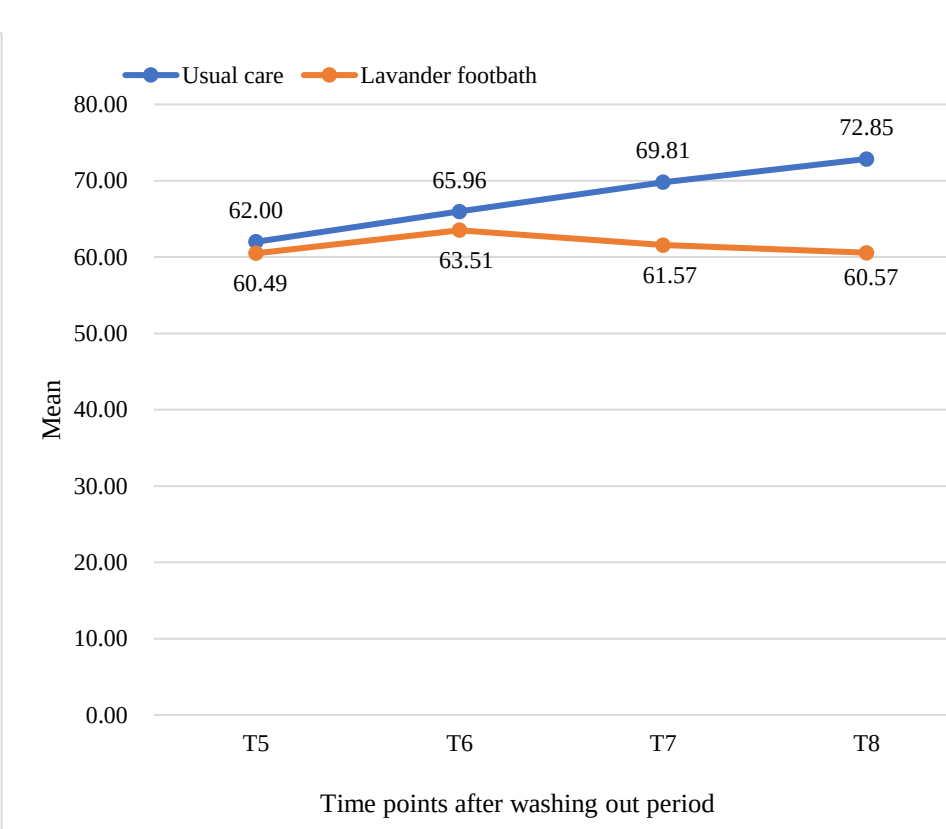


Figure 2 Nurses rated sleep quality before and after washing out period

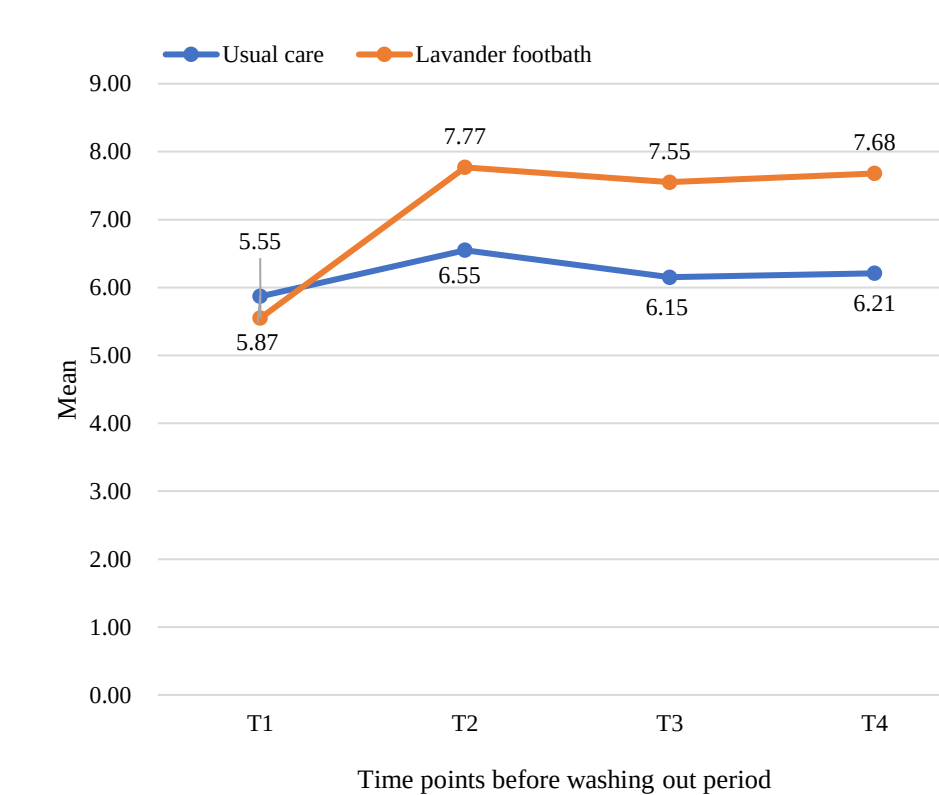
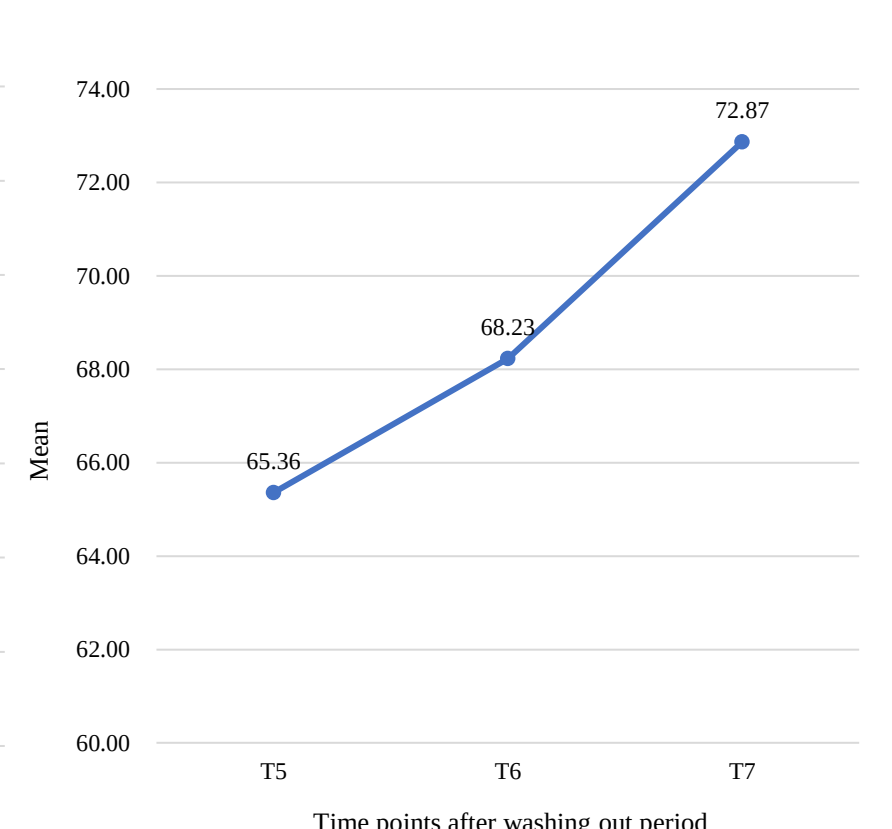
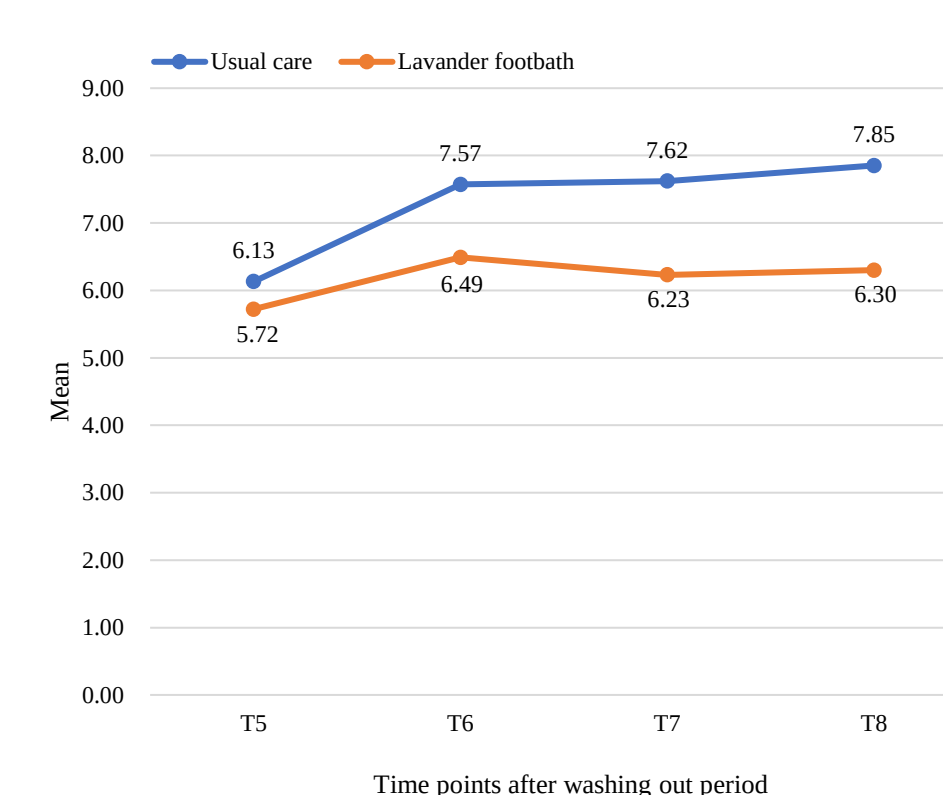


Figure 3 Self-rated comfort level before and after washing out period



CONCLUSIONS

- The lavender essential oil warm water footbath intervention had **significant between-group, within-group, and within-group and between-group interaction effects** on subjects' self-assessed **sleep quality**.
- The **subjects' sleep quality** assessed by the **nursing staff** also **significantly improved**.
- **Recommendation:** Respirator-dependent patients undergo a spontaneous breathing test in the subacute unit. Night sleep and comfort are very important to the patient. In addition to nursing staff, assistants, care attendants, and primary caregivers can give footbaths. The number of days can be adjusted as needed to increase or decrease the number of footbath days to enhance the nurse-patient relationship and interaction and reduce patients' discomfort during spontaneous breathing tests or respirator use.

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