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Research Article

Pinda Sweda

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Pilot Study on Temperature Dynamics of Pinda Sweda: A Step Toward Developing a Temperature Regulating Instrument

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Swedana, a key treatment for musculoskeletal disorders caused by Vata and Kapha, includes Sankara Sweda. Sankara Sweda is the first and foremost Sweda type of Sagni Sweda by Acharya Charaka. So, it must have special importance in the management of various diseases. Sankara Sweda again is of many types. Based on its properties generally, it can be further broadly classified into Snigdha Sankara Sweda and Ruksha Sankara Sweda. In practice, the Sankara Sweda procedure struggles to maintain a consistent temperature throughout treatment. To address this, two Pottalis and two therapists are required, making the process time-consuming. Our Pilot study revealed an average body temperature drop of 4°F and a Pottali temperature drop of 69°F within a 2-minute inter-Pottali change period, with each Pottali applied for 2 minutes. A study on Upanaha Swedana demonstrated that maintaining a constant temperature yielded statistically significant results, outperforming the conventional method while reducing treatment time to 30 minutes. Therefore, this pilot study aims to modify Sankara Sweda Pottali for consistent temperature, enhancing its efficacy in managing musculoskeletal and other diseases.

Keywords: Swedana, Sankara Sweda, Pottali, Upanaha Swedana, Ayurveda, Fomentation

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Introduction

Application of heat by various methods at a diseases site or throughout the body such that it causes perspiration is called as *Swedana*. It is defined as a procedure which induces *Sweda*, relieves *Sthambha, Gourava* and *Sheeta.*[1]

Swedana is an ancient method to ward off pain or atleast the sufferings due to pain. *Swedana* has been included under *Shadupakrama* and thus has been given importance to *Swedana* as a principal method of treatment.[2]

Swedana using bolus prepared of drugs with or without being wrapped in the cloth is called as *Pinda Sweda.*[3] The term *Pinda* denotes a lump or bundle. It is also known as *Sankara Sweda, Neevithapa*, *Pottali Sweda* and *Puta Sweda*.[4-6]

Sankara Sweda is a widely and mostly practiced *Swedana* procedure where the principle of treatment is based on the combined effect of heat and the medicinal properties of drugs. Hence, based on *Roga* and *Rogi* one can opt for different combinations of *Sankara Sweda* according to the availability and properties of the drugs. The *Sankara Sweda* is classified based on *dravya* used as *Ruksha* and *Snigdha Sankara Sweda.*[7]

Methodology

The pilot study involved *Churna Pinda Sweda, Patra Pinda Sweda*, and *Valuka Sweda* to record key temperature metrics in 30 healthy individuals. Measurements included the *Pottali's* temperature before application, the individual's body temperature before application, the *Pottali's* temperature after application, the time taken for heat loss, the body's temperature at that point, and the time required to reheat the *Pottali*.

Churna Pinda Sweda

Churna Pinda Sweda is one of the types of *Ushma Sweda*. In *Snigdha Pinda Sweda*, first *Abhyanga* with oil is done all over the body and the *Pottalis* are also heated in oil. In *Rooksha Pinda Sweda* the *Pottalis* are directly applied all over the body without *Abhyanga*. Here, *Rooksha Pinda Sweda* was done.

The *Upanaha Churna* was mixed with 500 ml of *Dhanyamla* properly and cooked.

The *Pottali* is heated in steam of *Dhanyamla* and *Swedana* was done *Ekanga*, upto the achievement of proper symptoms of *Swedana*.

Ingredients used for *Churna Pinda Sweda*

Materials / Drugs	Quantity
1. Churna - Upanaha Churna	350 gm
2. Kora Cloth 45cm X 45cm	1
3. Dhanyamla	1 litre

Patra Pinda Sweda

Patra Pinda Sweda is the type of *Pinda Sweda* where leaves of medicinal plants that have the property of *Vata Kaphahara* are roasted in a pan with little oil and a bolus is prepared by tying in the cloth. It is one of the types of *Ushma Sweda*.

Ingredients used for *Patra Pinda Sweda*

Materials / Drugs	Quantity
1. Arka	160 gms
2. Eranda	160 gms
3. Nirgundi	160 gms
4. Saindhava	10 gms
5. Shatapushpa	5 gms
6. Lemon	2
7. Haridra	5 gms
8. Murchita Tila Taila	100 ml
9. Kora cloth	1

Valuka Sweda

Valuka Sweda is one among the *Ruksha Sweda*. *Valuka Sweda* is the treatment in which sand is used for fomentation of painful parts. It can be done as *Sarvanga* (whole-body) or *Ekanga* (locally) *Swedana* procedure.

Ingredients used for *Valuka Sweda*

Materials	Quantity
1. Sand	500 gm
2. Kora cloth	1
3. Vessel	1
4. Tag	1

Results

The temperatures of the *Pottali* and the body were measured before, during, and after application using an infrared thermometer. The recorded temperatures were analysed using repeated measures ANOVA on ranks.

Table 1: *Valuka Sweda - Churna Pinda Sweda - Patra Pinda Sweda* - Body Temperature

SN	Comparison	q value	P< 0.05
1.	Baseline Body temp with 1st AT Body temp	7.897	Yes
2.	1st AT Body temp with 2nd BT Body temp	4.260	No
3.	2nd BT Body temp with 2nd AT Body temp	7.466	Yes
4.	2nd AT Body temp with 3rd BT Body temp	5.583	Yes
5.	3rd BT Body temp with 3rd AT Body temp	7.312	Yes
6.	3rd AT Body temp with 4th BT Body temp	4.773	Yes
7.	4th BT Body temp with 4th AT Body temp	5.219	Yes

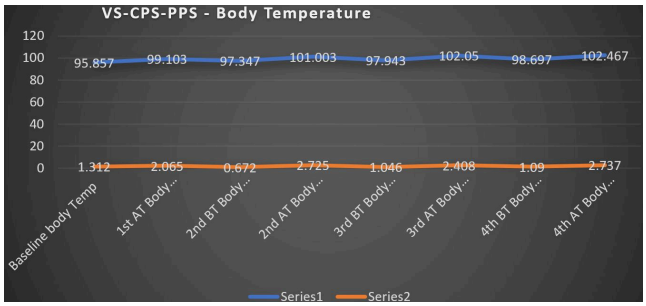

Figure 1

The analysis as in table 1 and figure 1 shows a significant increase in body temperature for most comparisons ($P < 0.05$), except between the 1st AT and 2nd BT body temperature ($q = 4.260$, $P > 0.05$). Overall, the upward trend indicates a consistent increase in body temperature post-intervention, suggesting the intervention's thermal effect.

Table 2: *Valuka Sweda - Churna Pinda Sweda - Patra Pinda Sweda* - Pottali Temperature

SN	Comparison	q value	P< 0.05
1.	Baseline Pottali temp with 1st AT Pottali temp	9.524	Yes
2.	1st AT Pottali temp with 2nd BT Pottali temp	9.457	Yes
3.	2nd BT Pottali temp with 2nd AT Pottali temp	9.747	Yes
4.	2nd AT Pottali temp with 3rd BT Pottali temp	9.186	Yes
5.	3rd BT Pottali temp with 3rd AT Pottali temp	8.912	Yes
6.	3rd AT Pottali temp with 4th BT Pottali temp	8.729	Yes
7.	4th BT Pottali temp with 4th AT Pottali temp	9.207	Yes

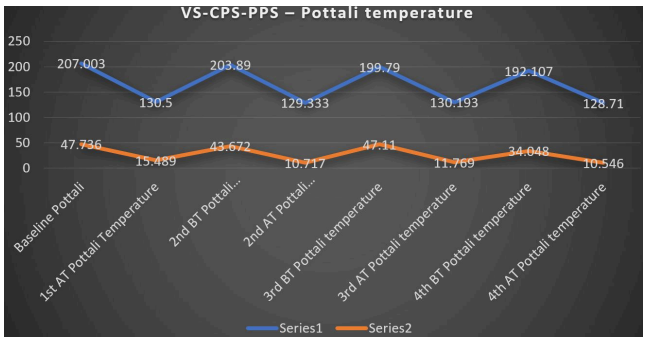

Figure 2

The results as in table 2 and figure 2 reveal statistically significant differences ($P < 0.05$) in *Pottali* temperature across all comparisons, indicating consistent and impactful changes at each interval. The q values range from 8.729 to 9.747, suggesting a uniform and effective modulation of temperature throughout the study. These findings emphasize the intervention's robust and reliable thermal effect.

Table 3: *Churna Pinda Sweda* - Body Temperature

SN	Comparison	q value	P< 0.05
1.	Baseline Body temp with 1st AT Body temp	5.124	Yes
2.	1st AT Body temp with 2nd BT Body temp	3.246	No
3.	2nd BT Body temp with 2nd AT Body temp	5.171	Yes
4.	2nd AT Body temp with 3rd BT Body temp	4.076	No
5.	3rd BT Body temp with 3rd AT Body temp	5.647	Yes
6.	3rd AT Body temp with 4th BT Body temp	4.491	Yes
7.	4th BT Body temp with 4th AT Body temp	3.763	No

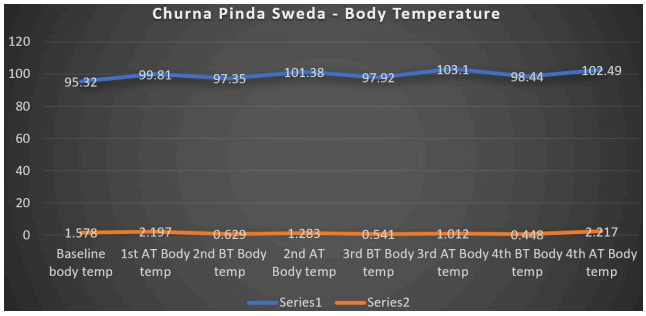

Figure 3

The results as in table 3 and figure 3 show significant temperature differences ($P < 0.05$) at several intervals, particularly post-intervention phases, indicating the intervention's effectiveness. However, non-significant changes in intervals like 1st AT-2nd BT and 2nd AT-3rd BT suggest periods of stabilization or reduced modulation, reflecting variability in the intervention's thermal impact over time.

Table 4: *Churna Pinda Sweda* - *Pottali* Temperature

SN	Comparison	q value	P< 0.05
1.	Baseline Pottali temp with 1st AT Pottali temp	5.920	Yes
2.	1st AT Pottali temp with 2nd BT Pottali temp	5.396	Yes
3.	2nd BT Pottali temp with 2nd AT Pottali temp	5.954	Yes
4.	2nd AT Pottali temp with 3rd BT Pottali temp	5.035	Yes
5.	3rd BT Pottali temp with 3rd AT Pottali temp	4.729	Yes
6.	3rd AT Pottali temp with 4th BT Pottali temp	4.817	Yes
7.	4th BT Pottali temp with 4th AT Pottali temp	5.171	Yes

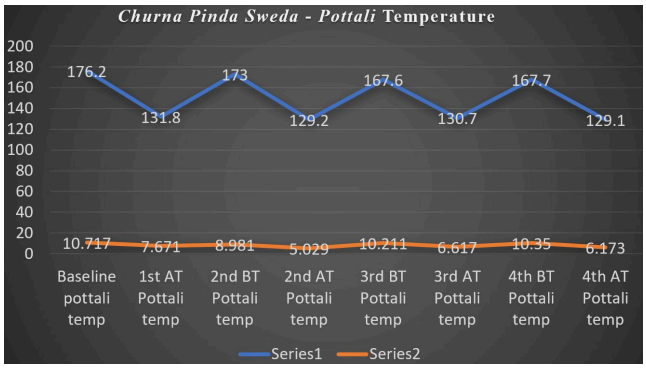

Figure 4

The results as in table 4 and figure 4 show statistically significant differences ($P < 0.05$) in *Pottali* temperature across all intervals, with q values ranging from 4.729 to 5.954.

This consistent significance indicates effective and uniform thermal modulation throughout the study, highlighting the intervention's reliability in maintaining meaningful temperature changes at each stage.

Table 5: *Patra Pinda Sweda* - Body Temperature

SN	Comparison	q value	P< 0.05
1.	Baseline Body temp with 1st AT Body temp	3.940	No
2.	1st AT Body temp with 2nd BT Body temp	1.932	No
3.	2nd BT Body temp with 2nd AT Body temp	3.457	No
4.	2nd AT Body temp with 3rd BT Body temp	1.742	No
5.	3rd BT Body temp with 3rd AT Body temp	1.633	No
6.	3rd AT Body temp with 4th BT Body temp	1.633	No
7.	4th BT Body temp with 4th AT Body temp	1.878	No

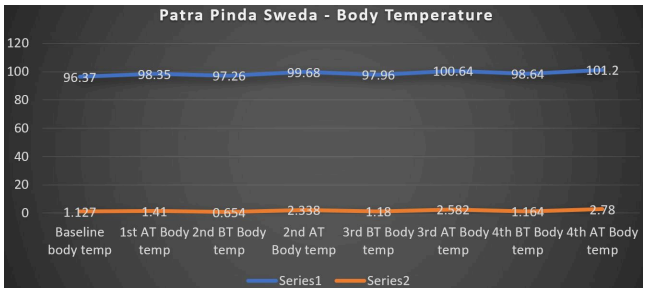

Figure 5

The results as in table 5 and figure 5 show no significant differences ($P > 0.05$) in body temperature across all comparisons, indicating the intervention did not produce substantial thermal effects.

This suggests that *Patra Pinda Sweda* might have minimal impact on body temperature modulation.

Table 6: *Patra Pinda Sweda* - *Pottali* Temperature

SN	Comparison	q value	P< 0.05
1.	Baseline Pottali temp with 1st AT Pottali temp	6.444	Yes
2.	1st AT Pottali temp with 2nd BT Pottali temp	6.539	Yes
3.	2nd BT Pottali temp with 2nd AT Pottali temp	5.457	Yes
4.	2nd AT Pottali temp with 3rd BT Pottali temp	4.838	Yes
5.	3rd BT Pottali temp with 3rd AT Pottali temp	4.770	Yes
6.	3rd AT Pottali temp with 4th BT Pottali temp	5.069	Yes
7.	4th BT Pottali temp with 4th AT Pottali temp	5.103	Yes

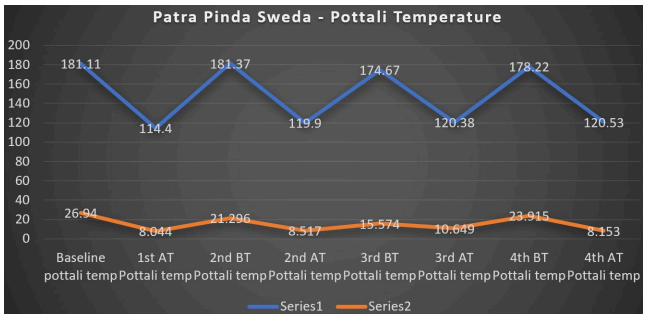

Figure 6

The results as in table 6 and figure 6 shows significant differences ($P < 0.05$) across all comparisons, indicating a consistent and meaningful increase in *Pottali* temperature post-intervention. This suggests the intervention effectively maintains thermal changes throughout the sessions, reflecting its ability to sustain heat and deliver a steady therapeutic effect without notable stabilization or variability.

Table 7: *Valuka Sweda* - Body Temperature

SN	Comparison	q value	P< 0.05
1.	Baseline Body temp with 1st AT Body temp	4.423	Yes
2.	1st AT Body temp with 2nd BT Body temp	2.096	No
3.	2nd BT Body temp with 2nd AT Body temp	4.219	No
4.	2nd AT Body temp with 3rd BT Body temp	3.831	No
5.	3rd BT Body temp with 3rd AT Body temp	4.375	Yes
6.	3rd AT Body temp with 4th BT Body temp	2.422	No
7.	4th BT Body temp with 4th AT Body temp	3.273	No

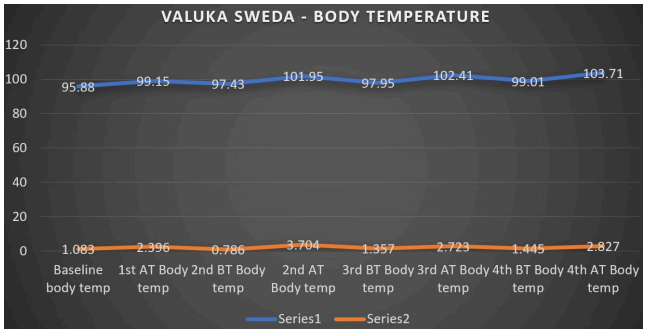

Figure 7

The results as in table 7 and figure 7 shows significant differences (P < 0.05) only in the baseline vs. 1st AT and 3rd BT vs. 3rd AT comparisons, indicating the intervention initially impacted body temperature but failed to sustain consistent changes across subsequent intervals. This suggests variability or reduced effectiveness over time in maintaining thermal modulation.

Table 8: *Valuka Sweda* - *Pottali* Temperature

SN	Comparison	q value	P< 0.05
1.	Baseline Pottali temp with 1st AT Pottali temp	5.253	Yes
2.	1st AT Pottali temp with 2nd BT Pottali temp	5.055	Yes
3.	2nd BT Pottali temp with 2nd AT Pottali temp	5.933	Yes
4.	2nd AT Pottali temp with 3rd BT Pottali temp	5.818	Yes
5.	3rd BT Pottali temp with 3rd AT Pottali temp	5.681	Yes
6.	3rd AT Pottali temp with 4th BT Pottali temp	4.491	Yes
7.	4th BT Pottali temp with 4th AT Pottali temp	4.906	Yes

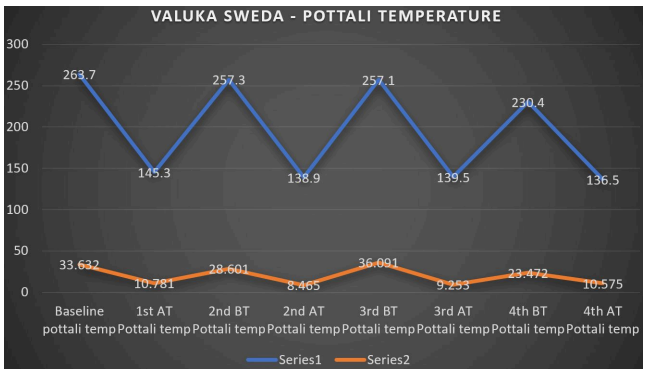

Figure 8

The results as in table 8 and figure 8 shows significant differences (P < 0.05) across all intervals, indicating consistent and sustained increases in *Pottali* temperature post-intervention. This suggests the intervention effectively maintains and regulates thermal changes throughout the sessions, reflecting its strong efficacy in producing and retaining heat for therapeutic purposes without significant variability.

Disscusion

Study revealed an average body temperature drop of 4°F and a *Pottali* temperature drop of 69°F within a 2-minute inter-*Pottali* change period, with each *Pottali* applied for 2 minutes.

From the Pilot study, it was observed that the temperature of the *Pottali* gradually decreased during the treatment process. This temperature decline necessitates periodic reheating to maintain the desired therapeutic effect.

The fluctuating temperature not only interrupts the flow of the therapy but may also affect its efficacy, as the therapeutic benefits of *Pottali*-based treatments are closely linked to the application of consistent heat.

Maintaining a constant temperature throughout the procedure can enhance the therapeutic efficacy by ensuring sustained heat delivery, improving tissue penetration, and optimizing the overall patient experience. The challenges posed by temperature variation underscore the need for technological advancements in this area. A device capable of maintaining the *Pottali* at a constant temperature would minimize interruptions, reduce the workload of the therapist, and ensure uniform heat application, thereby improving the outcomes of the treatment.

Future studies focuses on the development of such an instrument. This could involve exploring the integration of advanced heating technologies, such as thermostatically controlled heating elements, and materials with superior heat retention properties.

Additionally, the design should prioritize safety, ease of use, and compatibility with traditional *Pottali* techniques to preserve the authenticity of the treatment while modernizing its approach. The potential impact of such an innovation could lead to significant advancements in *Pottali*-based therapies, making them more efficient and reliable in clinical practice.

Conclusion

The pilot study highlights a significant limitation in *Pottali*-based therapies: the gradual decrease in temperature during treatment, which necessitates periodic reheating and may compromise therapeutic efficacy. Maintaining a consistent temperature throughout the procedure is crucial for optimizing treatment outcomes, enhancing patient comfort, and ensuring seamless therapy delivery.

This finding underscores the need for further research and innovation to develop a device capable of maintaining a constant *Pottali* temperature. Such advancements could modernize traditional techniques, improve efficiency, and enhance the overall effectiveness of *Pottali*-based treatments, bridging the gap between traditional wisdom and contemporary technology.

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