Validating energy effect of Uniwave® Pendant By Quantes® Technology on human organism

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Validating alleged energy effect of Uniwave® Pendant By Quantes® Technology on human organisms**

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Abstract

The company Destina1 International Sdn Bhd requested scientific validation of their product Uniwave® Pendant By Quantes® Technology, which purportedly exerts an energy effect on the human body. The validation was conducted through human subjects testing under controlled clinical research conditions. During the testing, participants wore the product around their necks.

The study revealed statistically significant differences (as indicated by p-values and Cohen's D) between the two testing situations. In both situations, subjects underwent identical procedures for the duration of the experiment. Given that the results demonstrate consistent and significant differences between the purported energy effect and control situation, we conclude that the product has a measurable impact on the human organism.

Keywords

Uniwave Pendant, physiological testing, physiological parameters, human organism, energy effect, clinical research conditions

** **Peer reviewed Report** (Vol. 2(2-R); see the reviewer's conclusion in Appendix; the whole review and the discussions between the reviewer and the BION research staff is archived at the BION Institute.)

CONTENTS

1 INTRODUCTION

1.1 General

A fundamental research area at the BION Institute represents measuring the effects/influences of physically as yet undefined and unrecognized (subtle) field(s) or weak conventional fields in the resonant mode, like a new quantum field, spin-spin interaction (Kernbach et al., 2013; Jerman, 2021). Generally, ordinary measuring devices are not adapted to measure these fields. However, most frequently, even various unconventional devices, purportedly measuring the subtle field effects, are not yet capable of measuring this kind of field (influences) reliably enough, although the technology is steadily improving. For the most part, these fields and their effects cannot be explained by commonly accepted theoretical interpretations, even though some scientists have offered possible explanations ranging from the quantum vacuum and coherent fields to dark matter (see Kernbach, 2022a; Meijer et al., 2021; Jerman et al., 2009).

In more than 25 years of experimenting with various detector systems for subtle field's testing, including also electrophotography and plant germination (Berden et al., 1997; Ružič, Jerman, 2002), the BION Institute developed an alternative path that makes it possible to use the *human organism* as a reliable detector of such weak or subtle influences (Jerman, Dovč, 2017). We learned how to express these detections via easily measurable general physiological effects monitored through physiological measurements (Jerman et al., 2019a, 2019b). Hence, we can reasonably evaluate the purported biological influence, or lack thereof, emanating from products or devices that exert a weak (subtle) impact. The latter may represent a stimulating factor or a protective shield against allegedly harmful environmental radiation.

1.2 Specific

1.2.1 The object of testing

The company Destina1 International Sdn Bhd requested the testing of an alleged energy influence on human organisms for the product Uniwave® Pendant By Quantes® Technology (hence: Uniwave Pendant; see Figure 1). Using a methodology grounded in clinical research conditions (see Portney, 2020; Lewith et al., 2010), the assumed energy effect was tested by exposing volunteer participants (hereafter referred to as testees) to the pendant's alleged influence against sham working control. Several physiological parameters (see Chapter 2.4) were monitored by the appropriate measurement protocol (Giannakakis et al., 2022).

The testing examined the potential impact of the measured magnetic field (which, due to its low intensity, is unlikely to have a biophysically explainable effect) as well as the influence of the subtle field associated with the test product. The aim was to assess the product's alleged effect on the human organism.

1.2.2 Working hypotheses

The general working hypothesis of the research follows the reasoning that if there is an energy influence of the product, there should be a sufficient level of statistically significant differences between the situation where the testees are exposed to the emanation of the product and the situation, where they are not (the control situation), especially when the test is double blinded.

The second working hypothesis, which followed the client's statements, was that the product has an anti-stress effect on the human body. It can be assessed by the differences in appropriate parameters.

2 MATERIALS AND METHODS

2.1 Object (product) subject to testing

Uniwave® Pendant By Quantes® Technology (Figure 1) produced by the company 2023. LTD was the test object. It doesn’t possess any electronic elements. However, it has a small, 3 mm wide static magnet (B = 0.75 mT). At the level of the inner side of the body, the field should be more than 1000 times lower than the geomagnetic field. In this respect, we can exclude any conventional electromagnetic effects; however, there is still a possibility of subtle biophysical effects produced by weak magnetic fields as known from many bioelectromagnetic studies (Anosov, Trukhan, 2012) and theoretically discussed in Kernbach (2022b).

Figure 1: Presentation of the product Uniwave® Pendant By Quantes® Technology used in the testing.

2.2 Testing principles

The manufacturer's claims regarding the working (influencing) on the human organism were validated by testing based on clinical research principles. This means that the tests were:

- *prospective* (general criteria for the efficiency of the product's influence are determined in advance);
- *with placebo effect ruled out* (testees don't know whether they are exposed to the product's influence or not);
- *double-blind* (even the test assistant doesn't know whether it is about the exposed situation or the control one);
- *randomized* (the decisions about the order of different situations are made randomly).

2.3 Situations investigated in testing

The alleged energy influence of the named product on the human organism was tested by measuring physiological parameters of the testees (Figures 3 in 4). In order to determine whether there was any energy effect, the testees were assigned to *two different experimental situations,* in a random order for a testee:

- exposed situation. Exposure to the Uniwave Pendant product: subject to a presumed energy influence of the named product (***Uniwave Pendant situation***),
- control situation. Here, sham-working artefacts resembling the named product were used (***Control situation***).

Figure 2: The tested product, Uniwave® Pendant by Quantes® Technology, and the control pendant (sham-working artefact) were placed in a fabric bag to conceal which product was used during the measurement.

Figure 3: The photo demonstrates the setup during testing of the presumed energy influence of the product on the human organism. After placing all the sensors on the testee (Figure 4), the latter sits for 35 minutes while physiological parameters are measured.

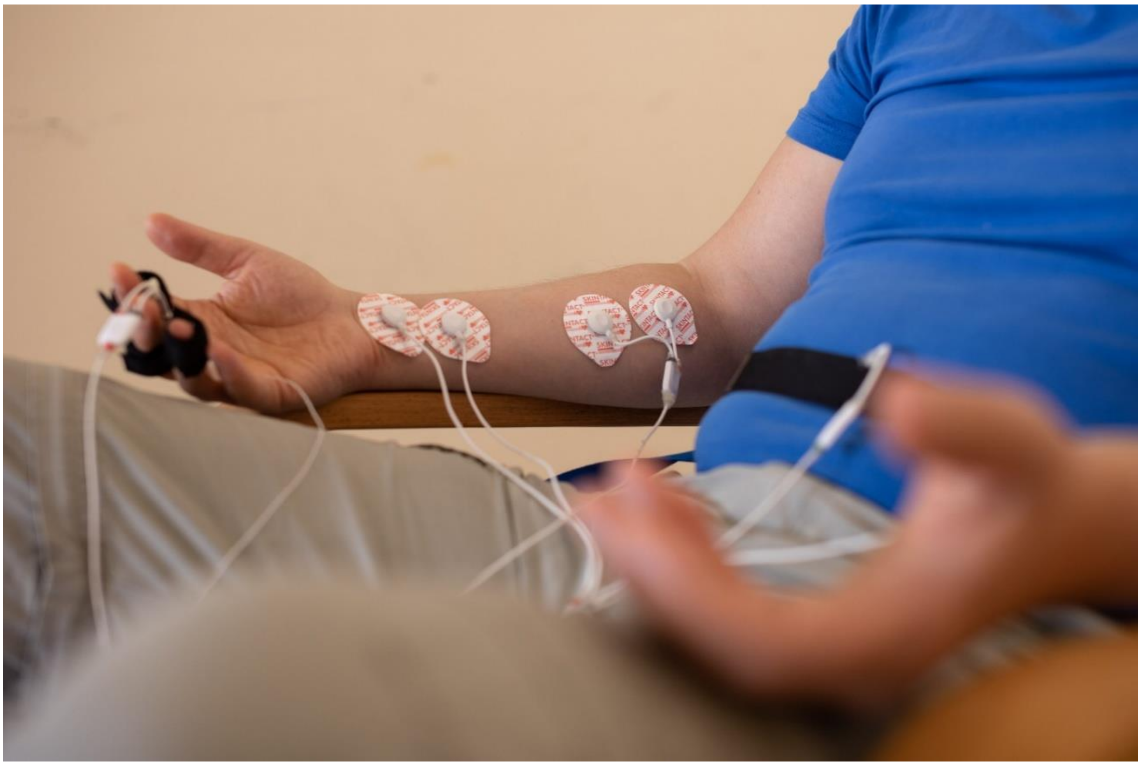

Figure 4: Demonstration of placed sensors during the test session.

Measurements were conducted from May 20 to 27, 2024 at the BION Institute with 16 testees aged 40 to 66 (ten females and six males) that were subjected to two situations. Before the tests, the testees were instructed not to eat a big meal at least one hour before the test and not to drink coffee, alcohol, or energy drinks at least three hours before the test. The physiological parameters of each person were measured two times on two different days, every time at the same time of the day. It ruled out the effects of other factors as much as possible (e.g., the testee could be tired after several hours of work but should be more or less at the same level of tiredness at the same time of day). Random order of both situations was applied to each testee (the principle of randomization). The testees sat for 35 minutes in a comfortable wooden chair. During this time, physiological parameters were measured, as presented in Figures 3 and 4. An 8-channel Biosignalsplux device was used to measure the aforementioned physiological parameters.

In both situations and across all measurements, the pendant (Uniwave Pendant and sham-working artefact) was enclosed in a fabric bag and worn on a string around their necks (Figure 2). The product remained unseen by both the test subject and the direct test assistant. Neither the testee nor the assistant knew when the tested product was being used (Uniwave Pendant situation). Then the physiological measurements started. The vast majority of the testees have long-term testing experiences involving various devices and products and tend to be quite indifferent regarding various testing situations. After the beginning of the measurements, the test assistant left the testees alone in the room.

2.4 Physiological parameters

Measurements of physiological parameters by an appropriate device make it possible to monitor dynamic responses to any agent allegedly influencing the human organism in real time. By default, the following parameters were measured:

Heart rate (frequency of heartbeat, HR) is calculated from the electrocardiogram (ECG). Differences in heart rate speak about activities of the autonomic nervous system (ANS) on its deep level in its two parts (sympathetic and parasympathetic).

Muscle tension (electromyogram, EMG) is measured on the right forearm. This parameter gives information about the state of the somatic nervous system in terms of tension or relaxation. Besides muscle tension, the EMG shows any artifacts that could appear on the ECG due to arm movements, which is then taken into account when processing the results.

Skin conductance (SC) is measured on the fingertips of the right hand, where it varies the most. Skin conductance measurements are part of lie detectors because both, sweating and blood flow affect it. Consequently, it is regulated by the sympathetic nervous system (see also Cowley, Torniainen, 2016; Boucsein, 2012). The latter is a part of the ANS that is not under our conscious control, so we cannot regulate it just by simple intention. In general, skin conductance is higher when a person is under stress (more sweating, faster interior blood flow), but sometimes the response may be much more complex.

Respiration rate (RR) is calculated from thorax expansion (TE), where the latter is measured with a special extendable elastic belt. Like the heart rate, the respiration rate primarily reflects the activity of the ANS, though it can be influenced by conscious control and may consequently partly reflect the functioning of the somatic system.

Finger temperature (TEMP) is measured on the tip of the right-hand ring finger. The interpretation of differences in this parameter depends on the differences in skin conductance and demands thorough consideration. In general, a higher peripheral temperature would mean a deeper relaxation (Boudewyns, 1976).

2.5 Data processing

2.5.1 Capture and primary data analysis

After the measurement phase the primary data analysis is performed. The raw data procedure goes as follows. The data with a sampling frequency of 1000 samples per second are imported into Matlab. Within Matlab, the electrocardiogram (ECG) data is analysed with the Pan-Tompkins algorithm (see Pan, Tompkins, 1985), from which the inter-beat interval (IBI) data is obtained. Heart rate is derived from IBI data. Thorax expansion data analysis yields the respiration rate (RR). All data are then resampled to one-second intervals by averaging the inter-second data points.

The first five minutes of the measurements are cut since they mostly correspond to the time needed for the testee to calm down at the measurements' beginning. Next, a geometric median of all testees is calculated for each measured physiological parameter. Two-time groups (marked as **Part A** and **Part B**), each one 15 minutes in length, are selected. Geometric medians are then resampled so that each 15 min time window (part) gets represented in 15 steps. Afterward, the results are renormalized to an average of the first five minutes. This means the whole session is divided into the already said two parts (A and B) and statistically evaluated for every parameter and each part separately.

2.5.2 Statistical analysis and evaluation

To check the difference between both test situations, the Wilcoxon signed-rank paired test is used. The results of all statistical tests are corrected with the Holm-Bonferroni correction for multiple comparisons[1]. The results are estimated as significant if the p-value is below 0.05. To decide if the influence of the tested product has an impact on human physiology, the outcome of the testing should have at least three statistically significant differences (after Holm-Bonferroni correction) in Parts A and B. If the p-value is between 0.05 and 0.1 and the absolute value of Cohen's D is above 0.5, then the result is considered statistically significant as well.

[1] Holm-Bonferroni correction is a method used to adjust the p-values of statistical tests in order to control the familywise error rate (FWER), which is the probability of making at least one false discovery (also known as a type I error) among all the statistical tests performed. This correction is used when multiple statistical tests are performed simultaneously on the same data set – as in our case, and the risk of making a false discovery increases as the number of tests increases.

3 RESULTS WITH DISCUSSION

3.1 Overall statistical differences in physiological parameters

An overview of the Wilcoxon signed-rank test (paired test) results after the Holm-Bonferroni correction for multiple comparisons demonstrates statistically significant differences between the two experimental situations for muscle tension (EMG) and skin conductance (SC) in both parts. The respiration rate parameter (RR) exhibited statistically significant differences in Part B. In addition, finger temperature (TEMP) also showed a highly statistically significant difference in the same Part. The majority of the statistically significant differences are found in Part B (see Table 1).

Table 1a: Summary of Wilcoxon signed-rank test corrected with Holm-Bonferroni correction for multiple comparisons (p-values). Values written in grey represent statistically insignificant differences between two experimental situations ($p > 0.05$), values written normally represent significant differences ($0.001 < p < 0.05$ or $0.05 < p < 0.1$ with absolute Cohen's D above 0.5), and the values written in bold a highly significant statistical difference ($p < 0.001$). **Marks**: HR – heart rate, EMG – muscle tension, SC – skin conductance, RR – respiration rate, and TEMP – finger temperature.

	HR	EMG	SC	RR	TEMP
Part A	0.223	0.063	0.005	0.194	1.000
Part B	1.000	0.019	0.005	0.019	**0.000**

Table 1b: The Levene's test was conducted with a Holm-Bonferroni correction. The notations and marks are the same as those shown in Table 1a, in addition to the value highlighted in magenta, which indicate a statistical trend.

	HR	EMG	SC	RR	TEMP
Part A	0.925	0.925	0.768	0.867	0.012
Part B	0.015	0.053	0.768	0.422	0.038

The Levene's test, after a Holm-Bonferroni correction (Table 1b), indicates a significant difference in variance for heart rate (HR) and a statistical trend of variance for muscle tension (EMG), both in Part B. The border statistically significant lower variance observed for EMG (see Figure 3) indicates that muscle tension remains relatively constant throughout Part B, with minimal fluctuations. In contrast, a higher variability of heart rate (HR, see Figure 2) observed in Part B for a Uniwave Pendant situation suggests dynamic autonomic responses, potentially due to the interaction between elevated muscle tension and slower respiration rate (RR, see Figure 5) (Vaschillo et al., 2011; Perry et al., 2019) or the seen effect may be attributed to differential individual responses to the product's purported energetic effect. This contrasts with the control situation, which exhibited less variance in HR (see Figure 2, Part B). Such divergence in response patterns suggests that participants reacted uniquely to the product's influence, possibly due to variations in individual physiology, ANS sensitivity, or overall health status. This differential reactivity to the product, as opposed to more uniform responses in the control situation, supports the notion of an active effect, especially since the testing was conducted with the placebo ruled out.

Furthermore, there are also highly significant differences in variance in the finger temperature (TEMP) in both parts (see Figure 6). Lower variance in finger temperature of volunteers subject to Uniwave Pendant suggests a more consistent blood flow to the extremities. It indicates a stable and relaxed physiological state, as with higher median values, the peripheral blood vessels seem to be less constricted.

3.2 More detailed results per parameters

In the following, box plot graphs are presented for each measured parameter belonging to both situations and two measurement parts. The line inside the box plot represents the median of normalized (to the first five minutes) average values, and an 'x' annotation indicates the mean, allowing direct comparison of all parameters.

The heart rate (HR) parameter shows no statistically significant differences between the situations (see Figure 2). It means that, at least under the conditions of our testing, the Uniwave Pendant does not have any profound effect on the autonomic nervous system. There is, however, a marked tendency to lower the heart rate.

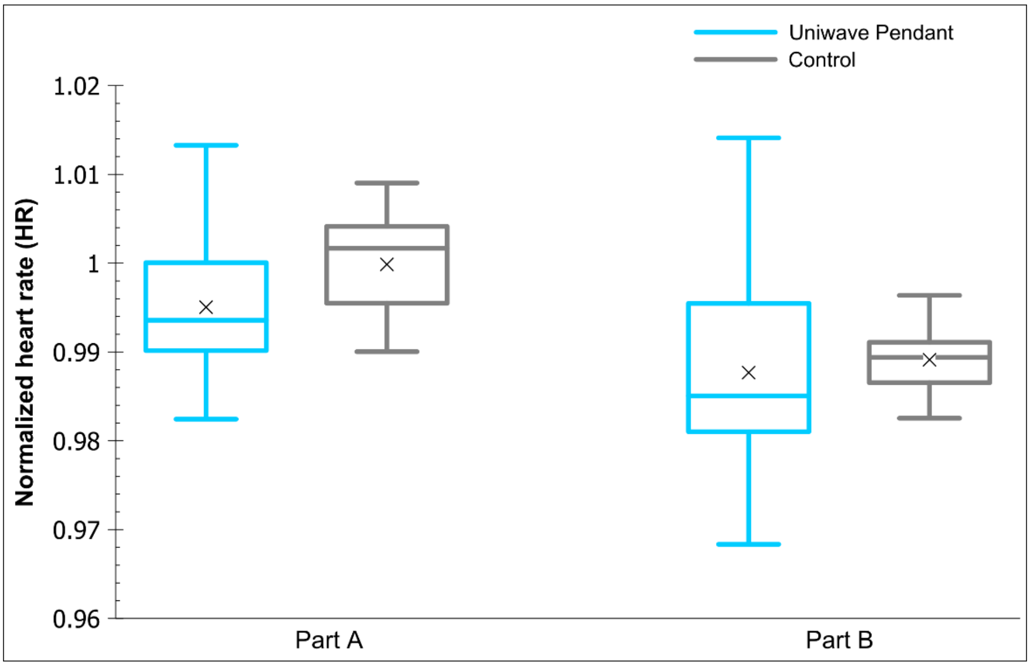

Figure 2: Normalized heart rate (HR) from the testees during two parts of measurements for two test situations. N = 15, each point taken from the geometric median of 16 testees.

The muscle tension (EMG, Figure 3) exhibited a statistically significant differences in both parts, with a positive Cohen's D value indicating an invigorating effect for this parameter. Compared to the control, the lower variance in muscle tension in Part B (see Table 1b) indicates a more focused (determined) impact of the Uniwave Pendant. The influence also raises muscle tone. Although increased muscle tension is often correlated with an increase in the stress state (Pluess et al., 2009), in conjunction with other parameters indicating relaxation, the interpretation of this parameter may be different, as it is difficult for the organism to be both stressed and relaxed simultaneously. Since this is the only parameter that clearly indicates the direction of arousal (and we are, therefore, dealing with asymmetry (Mitani et al., 2006)), this can be interpreted as an invigorating effect. It may mean an increased tone in terms of increased strength, especially in tired volunteers.

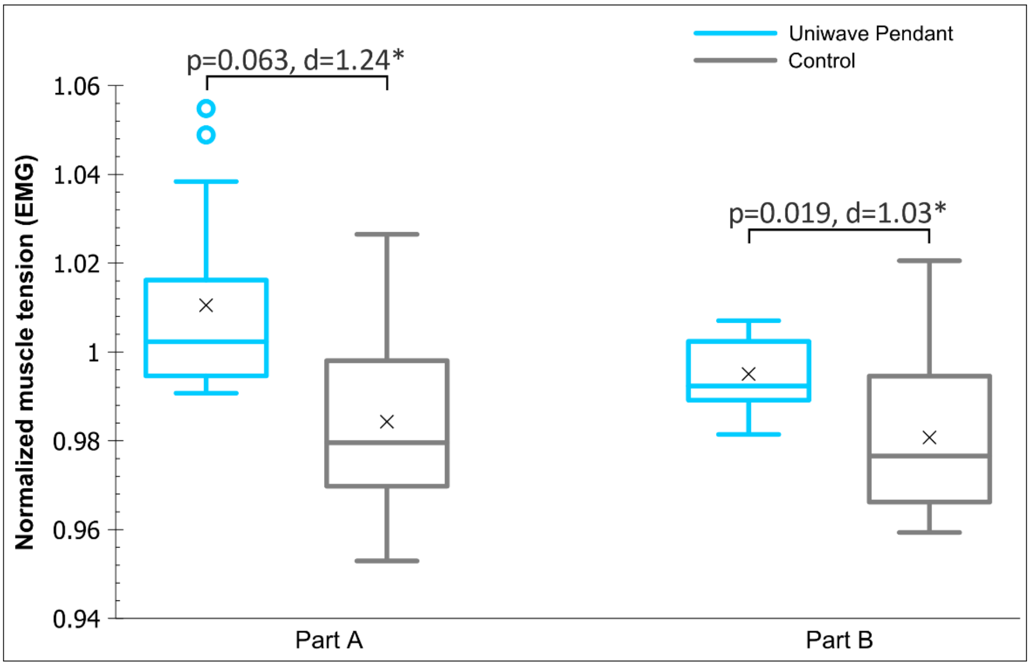

Figure 3: Normalized muscle tension (EMG) from the testees during two parts of measurements for the two test situations. N = 15, each point taken from the geometric median of 16 testees. The single asterisk (*) marks a statistically significant difference between two situations with $p < 0.05$.

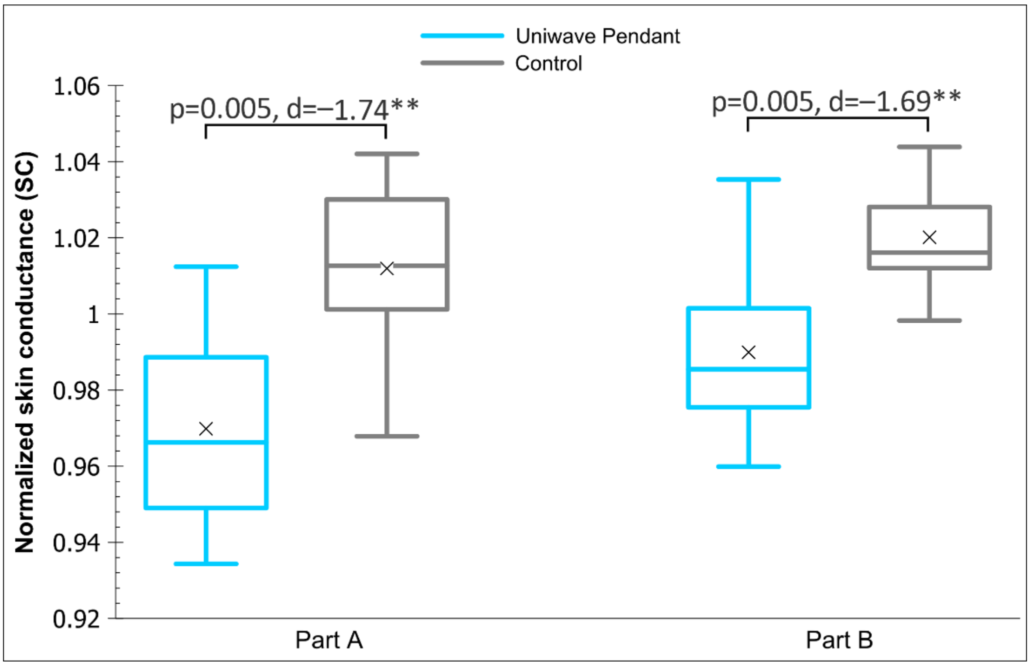

Figure 4: Normalized skin conductance (SC) from the testees during two parts of measurements for the two test situations. N = 15, each point taken from the geometric median of 16 testees. The double asterisk (**) marks a high statistically significant difference between the two situations with $p < 0.01$.

Figure 4 illustrates the significant differences in skin conductance (SC) between the Uniwave Pendant and Control situations in Parts A and B. Lower skin conductance values are frequently associated with reduced stress and anxiety as they reflect diminished physiological arousal; in other words, a higher relaxation (Yang et al., 2021).

The respiration rate (RR, Figure 5) demonstrates a significant difference between the Uniwave Pendant and Control situations in Part B. A lower value of the respiration rate (RR) is typically indicative of a calm and relaxed state. It indicates that the subjects are breathing more slowly and deeply, often associated with relaxation and reduced stress.

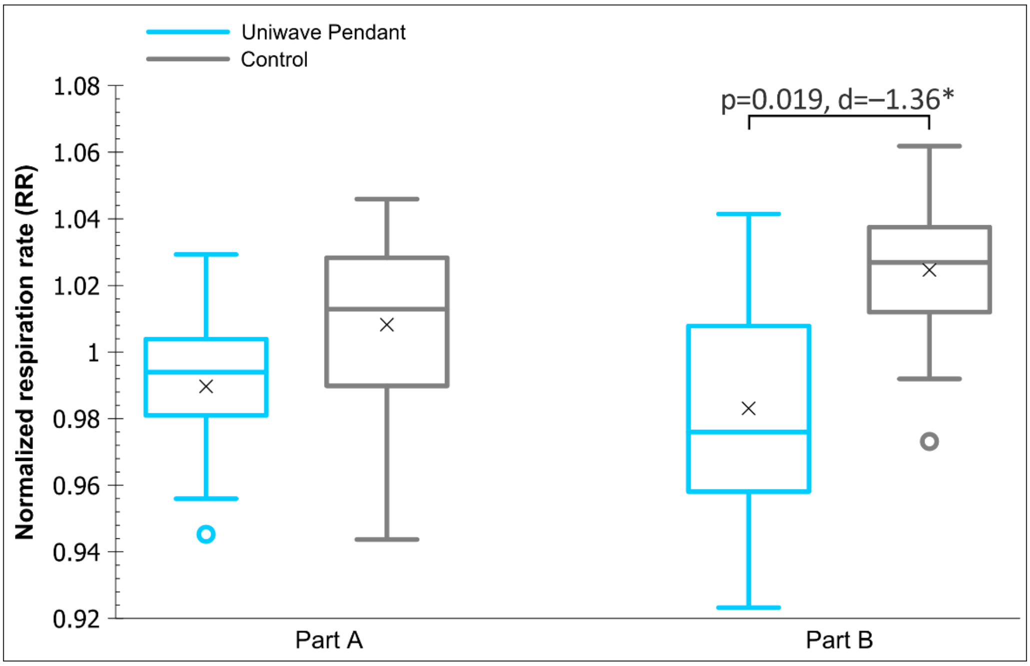

Figure 5: Normalized respiration rate (RR) from the testees during two parts of measurements for the two test situations. N = 15, each point taken from the geometric median of 16 testees. The single asterisk (*) marks a statistically significant difference between two situations with $p < 0.05$.

Figure 6 illustrates a highly statistically significant difference in finger temperature (TEMP) between the Uniwave Pendant and Control situations in Part B. An elevated finger temperature (TEMP) indicates increased blood flow to the fingers, a common indicator of relaxation. When the body is in a state of relaxation, the parasympathetic nervous system is dominant, resulting in vasodilation and an increase in blood flow to the skin and extremities.

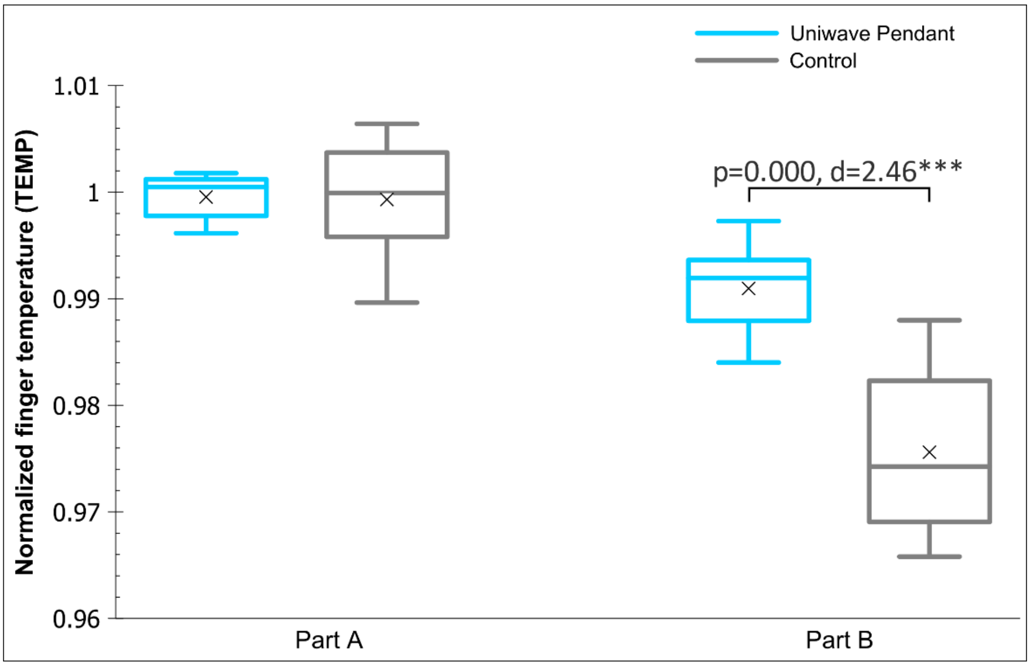

Figure 6: Normalized finger temperature (TEMP) from the testees during two parts of measurements for the two test situations. N = 15, each point taken from the geometric median of 16 testees. The triple asterisk (***) marks a very high statistical significance of $p < 0.001$.

3.3 Standardized effect size of Uniwave Pendant vs. Control situations

Besides statistical differences in significance, the standardized effect size (Cohen's D) was also calculated. It demonstrates the magnitude and the sign (direction) of the tested energy influence. To show the standardized effect size, colour coding for the intensity and the direction of the impact is used. The values are presented in Table 2 below. The latter shows an overview of the effect size for the measured physiological parameters in the two measurement parts.

Table 2: Cohen's D effect size for the measured physiological parameters. Negative values (blue colour) mean that the Uniwave Pendant decreased the parameter values compared to the control, while positive values (red colour) signify a relative increase in the parameter values. Values with an underlined black font designate result where a statistically significant difference ($p < 0.05$, or $0.05 < p < 0.1$ with absolute Cohen's D above 0.5) between the two tested situations was assessed. Other values are not statistically significant, at least after the Holm-Bonferroni correction. The intensity of the background colour designates the difference in magnitude: an absolute value less than 0.2 indicates a *small difference*, an absolute value between 0.2 and 0.8 indicates a *medium difference*, an absolute value between 0.8 and 2 indicates a *large difference*, and an absolute value above 2 indicates a *huge difference*. **Marks**: HR – heart rate, EMG – muscle tension, SC – skin conductance, RR – respiration rate, and TEMP – finger temperature.

	HR	EMG	SC	RR	TEMP
Part A	-0.72	<u>1.24</u>	<u>-1.74</u>	-0.72	0.06
Part B	-0.16	<u>1.03</u>	<u>-1.69</u>	<u>-1.36</u>	<u>2.46</u>

The assumed impacts on the ANS represented by blue-coloured heart rate (HR), skin conductance (SC), respiration rate (RR), and red-coloured finger temperature (TEMP) exhibits a relaxing effect. The majority of statistically significant differences with large effect size (see Table 2) is seen to be in Part B of the measurements. It appears that the main Uniwave Pendant effects exhibit themselves only gradually over time. Lower Cohen's D values of the skin conductance (SC) indicate reduced sympathetic nervous system activity and lower stress levels. A lower respiration rate (RR) reflects a calm respiration pattern typical of a relaxed state. Higher finger temperature (TEMP) suggests increased peripheral circulation and a strong relaxation response. Lower variance in finger temperature (TEMP, see Table 1b) in both parts indicates a more focussed (in the sense of a more determined influence) peripheral blood flow and autonomic function, reflecting consistent relaxation. Lower respiration rate (RR) and consistent lower finger temperature (TEMP) variance suggest strong parasympathetic (rest-and-digest) influence (Gibbons, 2019). Lower heart rate value (HR, Part A, Table 2) in Cohen's D (although not statistically significant) supports observed noticeable overall relaxation of the organism's ANS influenced by the named product.

The somatic nervous system, on the other hand, represented by the muscle tension parameter (EMG), exhibits an invigorating, tonifying effect in both parts. A more detailed analysis revealed statistically significant differences between Part A and Part B time groups within the Uniwave Pendant situation ($p = 0.012$, $d = -0.98$; data not presented in Figure 3). In contrast, no such differences were observed within the Control situation. As shown in Figure 3 the muscle tension (EMG) value in the Uniwave Pendant situation gradually decreases over time (compare the 'x' annotations indicating means). Despite this decrease, the EMG value in the Uniwave Pendant situation remains significantly different from that in the Control situation throughout the experiment.

4 CONCLUSIONS

The general working hypothesis was confirmed. It states that if a product has an objective effect, there should be a sufficient level of statistically significant differences between the situation where subjects are exposed to the product and the situation where they are not (control situation). Namely, testing the energy influence of the product Uniwave® Pendant By Quantes® Technology shows high overall statistical differences (meaning differences in p-value and Cohen's D) between the two testing situations (see Tables 1a and 2). In both cases, the testees were exposed to the same procedure during the whole time of testing.

Regarding the second hypothesis, the results demonstrated that three of the five parameters (SC, RR, and TEMP) aligned with the expectation of an anti-stress effect (parameter HR did so, too; only the difference was not statistically significant). Apparently, the muscle tension parameter (EMG) did not support the hypothesis; however, the asymmetry between the EMG and the other parameters may be attributed to the subjects' lower tiredness in the exposed situation. Indirectly, this may also be interpreted as a beneficial (energizing) effect by lowering tiredness or enabling the organism to harness energy resources better. The overall influence of the named product on the human organism relaxes the ANS (in the sense of anti-stress) and invigorates the somatic system.

5 REFERENCES

Anosov, A.V. and Trukhan, E.M., 2012. Variation of vector potential in laboratory conditions changes biological properties of water. *Biophysics*, *57*, pp.277-281.

Berden, M., Jerman, I. and Škarja, M., 1997. Indirect instrumental detection of ultraweak, presumably electromagnetic radiation from organisms. *Electro-and magnetobiology*, *16*(3), pp.249-26

Boucsein, W. (2012) *Electrodermal activity*. 2nd ed. New York: Springer.

Boudewyns, P.A., 1976. A comparison of the effects of stress vs. relaxation instruction on the finger temperature response. *Behavior therapy*, 7(1), pp.54-67.

Cowley, B.U. and Torniainen, J. (2016) 'A short review and primer on electrodermal activity in human computer interaction applications'. arXiv. Available at: http://arxiv.org/abs/1608.06986 (Accessed: 27 June 2024).

Giannakakis, G., Grigoriadis, D., Giannakaki, K., Simantiraki, O., Roniotis, A. and Tsiknakis, M., 2019. Review on psychological stress detection using biosignals. *IEEE transactions on affective computing*, *13*(1), pp.440-460. Available at: https://doi.org/10.1109/TAFFC.2019.2927337.

Gibbons, C.H., 2019. Basics of autonomic nervous system function. *Handbook of clinical neurology*, 160, pp.407-418.

Jerman, I., 2021. Detecting subtle field effect from coral calcium via droplet evaporation method. *Water: A Multidisciplinary Research Journal*, *12*, pp.1-16.

Jerman, I., Dovč, P. and Ratajc, P., 2019a. Influencing Relaxation by a Low Intensity Transcranial Pulsed Magnetic Stimulation Applying the Entrainment Model. *Open Access Library Journal*, *6*(9), pp.1-19.

Jerman, I., Dovč, P. and Ratajc, P., 2019b. Enhancing Vigilance by Low Intensity Transcranial Pulsed Magnetic Stimulation Applying the Entrainment Model. *Open Access Library Journal*, *6*(10), pp.1-23.

Jerman, I., Dovč, P., 2017. Standardising measurements of (ultra)weak non-ionising emissions. 2nd International Regional Conference SEENIRPA, Moravske Toplice; published on the Research Gate

Jerman, I., Leskovar, R.T. and Krašovec, R., 2009. Evidence for biofield. *Philosophical insights about modern science. Hauppauge, NY: Nova Science Publishers*, *9*, pp.199-216.

Kernbach, S. and Kernbach, O., 2022a. Environment-dependent fluctuations of potentiometric pH dynamics in geomagnetic field. *Electromagnetic Biology and Medicine*, pp.1-10.

Kernbach, S., 2022b. Electrochemical Characterization of Ionic Dynamics Resulting from Spin Conversion of Water Isomers. *Journal of The Electrochemical Society*, *169*(6), p.067504.

Kernbach, S., Zamsha, V. and Kravchenko, Y., 2013. Long and Super-Long Range device-device and operator-device Interactions. *International Journal of Unconventional Science*, *1*(1), pp.24-42.

Lewith, G.T., Jonas, W.B. and Walach, H. (2010) *Clinical research in complementary therapies: Principles, problems and solutions*. Elsevier Health Sciences.

Meijer, D.K., Jerman, I., Melkikh, A.V. and Sbitnev, V.I., 2021. Biophysics of consciousness: A scale-invariant acoustic information code of a superfluid quantum space guides the mental attribute of the universe. In *Rhythmic Oscillations in Proteins to Human Cognition* (pp. 213-361). Springer, Singapore.

Mitani, Y., Fukunaga, M., Kanbara, K., Takebayashi, N., Ishino, S. and Nakai, Y., 2006. Evaluation of psychophysiological asymmetry in patients with fibromyalgia syndrome. *Applied psychophysiology and biofeedback*, *31*, pp.217-225.

Pan, J. and Tompkins, W.J. (1985) 'A Real-Time QRS Detection Algorithm', IEEE Transactions on Biomedical Engineering, BME-32(3), pp. 230–236. Available at: https://doi.org/10.1109/TBME.1985.325532.

Perry, S., Khovanova, N.A. and Khovanov, I.A., 2019. Control of heart rate through guided high-rate breathing. *Scientific Reports*, 9(1), p.1545.

Pluess, M., Conrad, A. and Wilhelm, F.H., 2009. Muscle tension in generalized anxiety disorder: a critical review of the literature. *Journal of anxiety disorders*, *23*(1), pp.1-11.

Portney, L.G. (2020) *Foundations of clinical research: applications to evidence-based practice*. FA Davis.

Ružič, R. and Jerman, I., 2002. Weak magnetic field decreases heat stress in cress seedlings. *Electromagnetic Biology and Medicine*, 21(1), pp.69-80.

Vaschillo, E.G., Vaschillo, B., Pandina, R.J. and Bates, M.E., 2011. Resonances in the cardiovascular system caused by rhythmical muscle tension. *Psychophysiology*, 48(7), pp.927-936.

Yang, X., McCoy, E., Anaya-Boig, E., Avila-Palencia, I., Brand, C., Carrasco-Turigas, G., Dons, E., Gerike, R., Goetschi, T., Nieuwenhuijsen, M. and Orjuela, J.P., 2021. The effects of traveling in different transport modes on galvanic skin response (GSR) as a measure of stress: An observational study. *Environment International*, *156*, p.106764.

6 APPENDIX - Concluding comments from the reviewer

During September and October 2024, I reviewed the Report already published on Research Gate: **"Validating alleged energy effect of Uniwave® Pendant By Quantes® Technology on human organisms**" written by Igor Jerman, Jonatan Pihir and Mateja Senica; BION Institute, Ljubljana, Slovenia, EU.

According to the peer-review framework, my remarks, and review suggestions, the authors made the appropriate changes, additions, and corrections. I estimate the reviewed Report is now ready for publication on Research Gate.