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RESEARCH ARTICLE

C. elegans Survival Analysis: A New Path to Test Storage and Scalability of Healing Intention

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ABSTRACT

The pathway to widespread access to healing resides in our ability to store and scale the healing intention. Crystal, cotton, and other media have been considered as candidates to accomplish this purpose. The present non-blinded study builds on clinical findings to explore the potential of water to store and scale healing intention using the in vivo model of *C. elegans*, a well-described nematode. Two formulations of informed water, R1 and G1, were produced from capturing healing intention followed by scaling using a proprietary device. R1 had been used in a previous double-blinded, placebo controlled clinical study (Bengston & Nies, 2023). Wild-type and short-lived mutant worms were cultured in the presence of the two formulations of informed water. Treatment with R1 or G1 resulted in a 20% increase of lifespan in the mutant worms when compared to the control water. There was no effect of R1 or G1 on egg-laying capacity. The data from this experiment are strongly suggestive that 1) water is a good medium for the storage of healing; 2) the prepared samples can be replicated by a physical device and are hence scalable; 3) mass-produced informed water may deliver a strong effect on longevity. Future work on additional health conditions needs to be conducted.

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Water therapies, complementary medicine, storage of healing intention, *C. elegans*.

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INTRODUCTION

Can healing intention be both stored and scaled for widespread use? What media work for storing healing, and how can scaling be accomplished? These are questions that remain unanswered. To allow for widespread use, healing intention must be made storable so that it can be utilized as needed; in addition, healing must be made scalable so that it can be applied to large populations. These two conditions are routinely satisfied in the technology of a variety of traditional medical and non-medical communities. For instance, drugs can be stored with the potential for future application, and they can be mass-produced to meet wider demand (vitamins, antibiotics, vaccines, etc.). The same holds true for other technologies that can routinely store power, potential, and information for mass production (e.g., batteries). And while healing researchers have by now reasonably demonstrated the reality of what is sometimes called anomalous healing or biofield healing, there has been insufficient work on its storability, and the scalability problem has not been adequately addressed. This

paper addresses both storage and scalability problems in a controlled experiment that uses informed water as a therapeutic agent in a survival study with *C. elegans* worms.

Background

The examination of the storability of healing was first systematically studied by Bernard Grad at McGill University in the 1950's and '60's (Grad et al., 1961; Grad, 1963). Grad's studies with the Hungarian healer Oskar Estebany showed Estebany's intended healing, while holding pieces of cotton or beakers of water, had the same healing outcome when these substances were administered as surrogates for hands-on treatment. In effect, healing intention was demonstrably able to be stored in a selection of organic and inorganic materials.

Using actual physical devices, Tiller et al. demonstrated that experienced meditators could imprint these with a specific intention (Tiller et al., 2000). These devices, shipped several thousand miles to another lab, could decrease or increase the pH of water by one pH unit and could increase the ATP/ADP ratio in fruit fly larvae so as to significantly decrease their development time.

Jacques Benveniste, in a long series of controversial studies, demonstrated that biological signals could be extracted and recorded, and stored in water, and the playback of these signals to water could reproduce the original biological response (Thomas, 2007). Benveniste called this "digital biology." Beauvais, a former lab employee, analyzed Benveniste's experiments and suggests that Benvenistes findings were rather an experimenter effect (Beauvais, 2018). Following and building upon the inquiries of Benveniste, Nobel laureate Luc Montagnier demonstrated the experimental conditions by which electromagnetic signals of low frequency can be emitted by diluted aqueous solutions of some bacterial and viral DNAs. The recorded electromagnetic signals in water carry the DNA information of the original (Montagnier et al., 2015).

Other methods of storing and scaling healing intention have included using sophisticated EMF detectors inside a Faraday cage, and the signals from the various detectors are combined and reduced to an audio file. These recordings played either to cancer cells in vitro (Beseme et al., 2018) or to mice in vivo (Beseme et al., 2020; Bengston et al., 2023) produced some significant but not well-understood biological effects. By the same token, initial findings are suggestive that the recordings, although producing biological effects, may not be as efficacious as one-on-one healer-to-healee approaches.

These examples illustrate the explorative work in storing and scaling healing intention. As this was a preliminary study to see if the water that proved effective in a double-blinded clinical trial with COVID (Bengston & Nies, 2023) would have an impact on other conditions, the study was not blinded. Experimenter bias, which may come into play when the person performing the experiments knows the materials being used, could have impacted outcomes in this study. Consequently, we suggest this be considered when reflecting on the study and that further research in this direction should be blinded to mitigate this drawback.

Two formulations, R1 and G1, were evaluated in this study. R1 had been previously used in a double-blind, placebo-controlled clinical trial with hospitalized COVID patients (Bengston & Nies, 2023). G1 combines S-Acetyl L-Glutathione (SAG) with R1. Indications are that SAG has antioxidant, detoxification, and anti-aging properties (Arslan et al., 2025; Hamidu et al., 2025). An in vivo model, the nematode *C. elegans*, was used in this study to evaluate R1 and G1 because it has been established as a key model organism for studying longevity and aging, due to its short lifespan, well-characterized genetics, and ease of manipulation.

Goal

To assess the effectiveness and potential scalability of information-infused water therapies in a survival study using *C. elegans*.

METHODS

Treatments

Informed water is the descriptor given to water that carries information, in this case, healing information. In this study, two types of informed water were used, R1 and G1. R1 was produced in a two-step process. During the first step, approximately 6 oz of charcoal filtered tap water was treated for one-half hour by William Bengston using the techniques that he developed (Bengston, 2007, 2010). The treated water was then serially diluted and succussed. Filtered tap water was used in the dilution process. The resulting formula, labeled R0, was used in the second step.

For the second step, R0 was placed in a proprietary device designed and intended to scale and replicate. This device was made of copper, had a hose fitting for water input and output, and a central cylinder into which the material to be duplicated was placed. The output water

moved around the central cylinder. The outgoing water from the device was the informed water, labeled R1, used in these experiments.

G1 is produced by placing R0, described above, in the proprietary device along with a glass bottle containing 86 capsules (100 mg each) of S-Acetyl L-Glutathione (Vitakruid brand) in the device as above. The outgoing water from the device was labeled G1. The resulting informed waters were stored in three 2-oz colored glass bottles. Filtered tap water from the same water source was used as the control.

Strains and Maintenance

Two Caenorhabditis elegans strains were used in this series of experiments: the wild-type strain (# N2, CGC) and the daf-16 mutant strain (# CF1038, CGC), which is associated with a shortened lifespan. Both strains were provided by the CGC, which is funded by NIH Office of Research Infrastructure Programs (P40 OD010440), and were maintained at 20°C on nematode growth media (NGM) plates seeded with Escherichia coli OP50 as a food source.

Survival Experiments

The experiments were not blinded and conducted on pre-treated feeding plates prepared at the beginning of each trial. Nematode Growth Media Agar Plates (60 mm, Teknova; 8 per trial) were seeded with E. coli OP50 as previously described (Brenner, 1974). At the same time, 8 drops of the respective water treatments (R1, G1, or control water) were added to the plates. The plates were stored at 4°C and used during the trial to transfer the worms as necessary. For each trial, 10 or 15 nematodes per treatment group were used. Nematodes were transferred to new pre-treated feeding plates every 3 to 4 days to ensure food replenishment and to prevent overcrowding. This also allowed the separation of adult nematodes from newly hatched larvae. The number of living nematodes was counted daily until all nematodes had died. Each treatment condition was assessed in both the N2 wild-type strain and the daf-16 mutant strain.

Data Analysis

Kaplan-Meier statistical analysis of survival was performed with the online tool OASIS 2 - Online Application for Survival Analysis 2. Access: https://sbi.postech.ac.kr/oasis2/#.

ANALYSIS

Effect of Informed Water on Wild Type Strain

We first tested the water on the wild type strain N2 using two treatment modalities – either adding 8 drops of water while preparing the plates with the food source (E. coli OP50) prior to transferring the *C. elegans or* adding two drops of the informed water every day. The latter modality did not yield a difference between the control and the treatment groups, suggesting that adding drops every day may not affect lifespan by itself, regardless of the nature of the treatment (data not shown). All further experiments presented in this study were conducted as described in the Method section, with treatment of informed water or control water added prior to adding the worms to the plates.

Figure 1 shows the Kaplan-Meier survival curve obtained from testing the two informed water formulations, R1 and G1, on wild-type worms. While statistical analysis did not show a significant difference, the curve indicated a trend; the informed water seemed to delay the death of worms between 12 and 18 days, but it took the same amount of time (26 days) for all worms to die.

In light of these results, we opted to test the informed water on a mutant with a shorter lifespan (daf-16 mutant). The rationale was to be able to observe a potential extension of the lifespan.

Historically, only organisms with a "need" respond to healing, whether using treated substances such as cotton or water or direct hands-on. Mice that have a healing need will move to the left hand of the healer. Once they are completely cured, this no longer happens (Benston & Fraser, 2010). Similarly, cells that have a healing need will respond to healing with intent, whether that healing source comes directly from the hands of a healer, or healing apparently stored in substances such as water, cell medium, or cotton. Cells that have no healing need exhibit no anomalous changes when offered healing with intent. And so, at a minimum, it can be posited that biological need is a crucial component in healing, and it may be the healer who instigates the healing effect (Bengston, 2017). The suggestion could be made that the wild-type worms have no need and therefore would not show a response to the informed water. However, we feel it is premature to come to this conclusion from this experiment alone and suggest that this should be explored further.

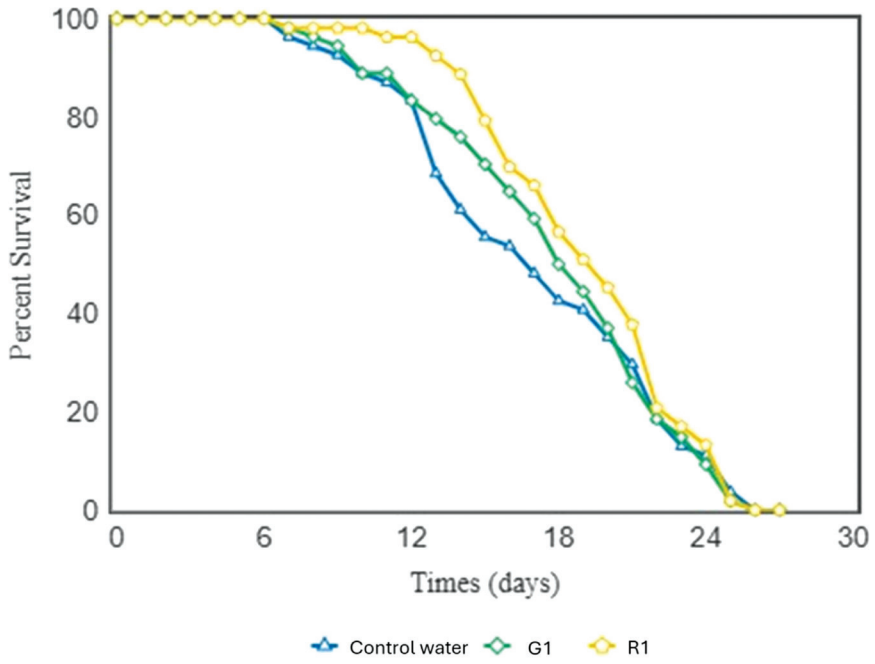

Figure 1. Survival Curve of Wild Type Worms Treated with R1 and G1.
This figure shows the survival curve for a total of 55 *C. elegans* from 4 plates (10 or 15 worms per plate). Each plate was handled independently. Worms were placed on feeding plates pre-treated with control water (blue), G1 (green) or R1 (yellow) and the number of worms was counted daily as described in the Methods section. The survival curve was produced with OASIS-2 (https://sbi.postech.ac.kr/oasis2/#). Statistical analysis using a log-rank test did not show a significant difference between the groups.

Effect of Informed Water on Survival of Daf-16 (Short-Lived) Mutant

A first series of 3 independent trials was conducted, including 10 *C. elegans* per trial per plate. Figure 2 shows the survival curve for both treatments (informed water G1 and R1) and the control water. A second control with no water was included in the design of the experiment to keep the worms in their normal settings and yielded the same results as the control water group. For increased clarity, it is not shown on the survival curve.

The survival curve shows that worms treated with informed water had a significantly longer lifespan than worms treated with the control water. The p-values shown on the figure were obtained with a log-rank test, which tests the null hypothesis that there is no difference between the populations in the probability of a death at any time point. The analysis is based on the times (days) of deaths.

The mean survival was 14.13 days (95% C.I 12.60 - 15.67) for the control group, while it was 16.13 days (95% C.I 14.44 - 17.83) for G1 and 16.97 days (95% C.I. 15.26 - 18.68) for R1.

To increase the significance of these encouraging results, three more trials were conducted with 15 *C. elegans* each (instead of 10 in the first series).

As in the first series, the worms treated with control water and no water died at the same pace. The difference in survival between the treatment group and the control group was confirmed, and the p-value was lowered to 0.0014 for G1 and 0.0013 for R1.

Because the two sets of experiments were identical in design, execution, and results, the 6 trials were combined for analysis. Figure 3 and Table 1 show results for the 6 trials combined.

Table 1 shows the average lifespan of the treated worms. It was significantly longer for both Informed water groups (G1: 15.3 days, 95% C.I. 14.4-16.2; R1: 15.55 days, 95% C.I. 14.51 - 16.59) compared to the control group treated with control water (12.77 days, 95% C.I. 11.9-13.7). This 20% lifespan extension under the treatment condition is significant, with a p=0.002 and p=0.000042 when running the log-rank test for G1 and R1, respectively.

Table 2 divides the data into survival percentiles. The worms in the treatment groups generally lived longer, as evidenced by higher mortality ages at each percentile

(25%, 50%, 75%, 90%, 100%) compared to the control water group. For the control group, 25% percent of worms were dead by day 10, while it took 12 days for 25% of worms to die in the treatment group. This difference of two to three days was maintained throughout the duration of the experiment.

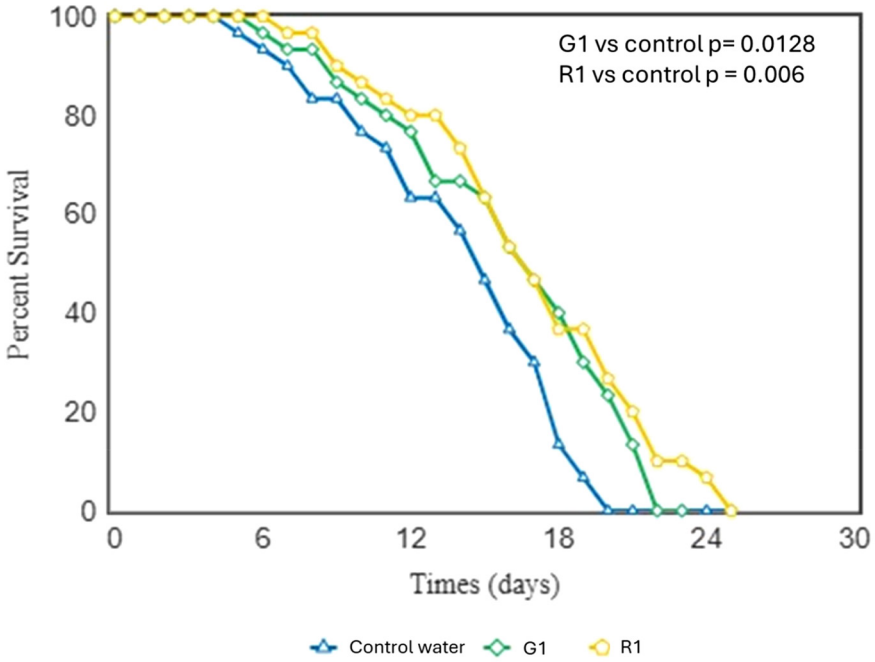

Figure 2. Survival Curve of Daf-16 Worms Treated with G1 or R1 (Trials 1–3).
This figure shows the survival curve for a total of 30 *C. elegans* from 3 plates 10 worms per plate). Each plate was handled independently. The survival experiment was conducted as described in the Method section. The survival curve shows results for the control water group (blue) and the two informed water groups, G1 (green) and R1 (yellow). The p-value was obtained with a log-rank test, comparing the control water group to R1 and G1.

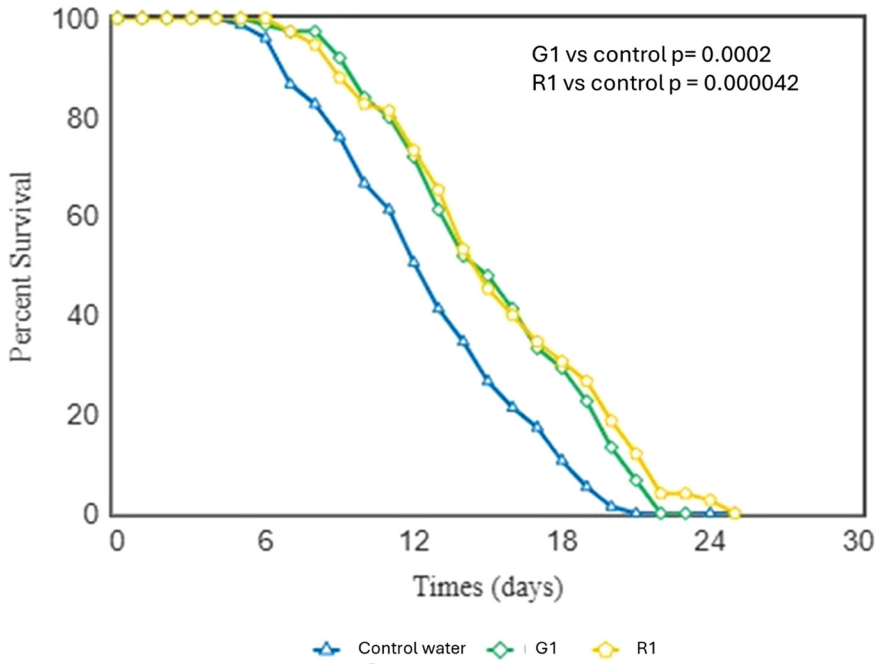

Figure 3. Survival Curve of Worms Treated with G1 or R1 (6 Trials Combined).
This figure shows the survival curve for a total of 75 worms from six independent trials. The survival experiment was conducted as described in the Method section. The survival curve shows results for the control water group (blue) and the two informed water groups, G1 (green) and R1 (yellow). The p-value was obtained with a log-rank test, comparing the control water group to R1 and G1.

Table 1. Average Lifespan of Daf-16 Mutants.

Name	No. of subjects	Average lifespan (days)	Standard error	95% C.I.
Control water	75	12.77	0.47	11.85 ~ 13.70
Informed water G1	75	15.29	0.48	14.35 ~ 16.24
Informed water R1	75	15.55	0.53	14.51 ~ 16.59

Table 2. Mortality Percentile.

Name	25%	50%	75%	90%	100%	95% Median C.I.
Control Water	10.00	13.00	16.00	19.00	21.00	12.0 ~ 13.0
Informed water G1	12.00	15.00	19.00	21.00	22.00	14.0 ~ 16.0
Informed water R1	12	15	20	22	25	14.0 ~ 16.0

Effect of Informed Water on Egg-Laying Capacity of C. elegans

In an effort to further characterize the effect of R1 and G1, we investigated the egg-laying capacity of the worms. While we did not explore which stage of development was affected in this lifespan extension, the rationale was that worms that live longer may have a longer reproductive period and therefore lay more eggs than worms living a shorter life. Four trials were run where R1 and G1 were used along with two controls: no treatment and control water, as outlined in the trials above.

Table 3 shows the results of the egg-laying experiment. Eggs were counted under a microscope every day. Adding water (informed or not) tends to slightly increase the egg-laying capacity of the worms (Average: 133.25 (control water); 134.75 (G1), 136.5 (R1), vs 126.75 in the untreated control worms). This effect was not treatment-specific, and this trend was not significant when comparing the treatment groups with a Student's t-test.

Table 3. Egg-Laying Capacity of Treated Worms.

	No treatment	Control water	G1	R1
Trial 1	124	131	127	136
Trial 2	115	141	134	129
Trial 3	141	128	142	139
Trial 4	127	133	136	142
Average	126.75	133.25	134.75	136.5
SD	10.78	5.56	6.18	5.57

DISCUSSION AND CONCLUSION

The present study investigated whether informed water—purported to retain and convey healing information—could influence lifespan and egg-laying capacity in Caenorhabditis elegans and whether such effects might support the concept that healing information can be stored, preserved, and scaled for distribution. Using both a standard wild-type strain (N2) and a short-lived daf-16 mutant strain, we evaluated the effects of two informed water formulations (R1 and G1) relative to tap water controls on organismal survival and reproductive capacity.

In wild-type worms, neither formulation produced a statistically significant change in lifespan under the conditions tested, though the survival curves suggested a modest trend toward delayed mortality between days 12 and 18. This lack of statistical significance in the N2 strain may reflect the relatively long baseline lifespan and robust stress-resistance mechanisms inherent to the wild type, which can mask subtle effects.

By contrast, in the daf-16 mutants—an established short-lived strain with impaired stress-response pathways (Lin et al., 2001) — treatment with both informed water formulations yielded a reproducible and statistically significant extension of mean lifespan. Across six independent trials, lifespan increased by approximately 20% relative to the control water. This effect was consistent in both initial and expanded replication trials and was reflected in percentile analyses, which showed a two-to-three-day delay in mortality across all survival thresholds.

Daf-16 is a transcription factor that regulates expression of genes involved in age-related stress response. The mutant used in this study does not express the protein, rendering the worms more susceptible to age-induced perturbations, therefore decreasing the lifespan in the daf-16 null mutant (Li et al., 2019).

These findings suggest that under conditions where physiological resilience is compromised, informed water can produce measurable and biologically relevant effects on longevity. Although this study did not explore the molecular mechanisms of this effect, it is likely that daf-16 is not involved, as the mutant used in this study does not express daf-16. Further mechanistic studies are warranted.

R1 and G1 informed water yielded similar results in this study. Further comparative characterization is necessary to determine whether SAG could enhance the effects of R1. While this was the first time that G1 was evaluated in a study, R1 had previously been assessed with hospitalized

Covid patients. In this double-blinded trial, patients taking drops of the informed water (labeled R1 in the current study) reported significant improvements in a number of symptoms: general feeling, temperature, sore throats, and coughs, as well as higher levels of general health and fewer positive results for viral infection (Bengston & Nies, 2023).

The present results and previous findings from the clinical trial are noteworthy. The observed survival benefits in daf-16 mutants and the improved symptoms of Covid patients were obtained without the direct presence or intervention of a healer during the experiments, indicating that any beneficial property of the water—if linked by cause to the observed effects—was successfully stored and retained from the time of water preparation through to the duration of exposure. This supports the possibility that healing intention, once embedded into water, may be preserved long enough to be used as a practical delivery medium. Moreover, because the same prepared water samples were sufficient to elicit effects across multiple independent trials, the findings are consistent with the concept of "scaling," in which a single batch of informed water could potentially be distributed to produce similar outcomes in multiple recipients.

The study also examined egg-laying capacity as a secondary measure, motivated by the possibility that extended lifespan might correlate with extended reproduction capability. While adding water to the plates (whether informed or not) modestly affected reproductive output, no treatment-specific differences were detected. This suggests that the mechanism underlying the lifespan effects observed in daf-16 mutants may be associated with a later, non-reproductive phase of the nematode.

Despite these encouraging findings, several limitations must be acknowledged. First, while *C. elegans* provides a well-established model for lifespan research; results in this system cannot be assumed to translate directly to complex organisms without additional mechanistic investigation. Second, although the use of daf-16 mutants allowed for clearer detection of effects, the precise molecular or biophysical mechanism through which informed water might extend lifespan remains unknown. Possible explanations could include changes in water structure, subtle alterations in dissolved solutes, or yet-undetected energetic phenomena, all of which warrant further investigation. Third, while care was taken to standardize plate preparation and handling, future work should explore blinded experimental designs and independent replication to further exclude experimenter bias. Finally, the study did not directly address the duration of information retention in water under varying storage conditions, which is a critical consideration for real-world scaling applications.

Future research could focus on at least three areas:

1. Mechanistic studies to determine the pathways through which informed water influences lifespan, possibly involving stress-response markers, gene expression profiling, or metabolomic analysis.
2. Scalability and stability tests to assess how long stored healing energy remains active in water and whether large-scale batches retain efficacy across time and distribution.
3. Cross-species validation to determine whether similar effects occur in other model organisms, providing a stronger basis for translational relevance.

In conclusion, this study utilizing *C. elegans* and the previously mentioned clinical trial with Covid patients provides preliminary but compelling evidence that water informed with healing intention may retain properties capable of influencing biological outcomes, at least under certain physiological conditions. The reproducible extension of lifespan in daf-16 mutant *C. elegans* worms and the results of the COVID study suggest that such information can be stored and later delivered via water without direct healer intervention, offering a potential pathway for scalable distribution. These results lay the groundwork for deeper exploration into both the fundamental nature of informed water and its practical applications in extending health and vitality. Both studies indicate that R1, and potentially other informed water formulas, could open a large area of interesting study, such as what conditions R1 can be effective on, the effect on severity and length of condition, etc.

Returning to the larger questions of storability and scalability, the data from this non-blinded experiment and the previous clinical trial are strongly suggestive that 1) water is a good medium for the storage of healing intention (Bengston & Nies, 2023), 2) the prepared samples can be replicated by a physical device and is hence scalable (Bengston & Nies, 2023), 3) mass-produced informed water can deliver a strong effect on Covid (Bengston & Nies, 2023 and potentially longevity. As mentioned earlier, future blinded research needs to be conducted to verify the results of this study. We also suggest that studies be conducted to test the informed water on the impact on additional health conditions.

NOTES

The informed water described in this study is available to any researcher wishing to replicate the findings or to collaborate upon request to the corresponding author.

AUTHOR CONTRIBUTIONS

Sarah Beseme: Investigation, Formal Analysis, Writing - Original Draft. Jeremy Lins: Investigation. William Bengston: Conceptualization, Methodology, Writing - Original Draft, Funding acquisition. Margaret Nies: Writing - Original Draft. John McMichael: Conceptualization, Methodology, Writing - Original Draft.

CONFLICT OF INTEREST

William Bengston is the developer of the Bengston Energy Healing Method.

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