Forschende Komplementärmedizin
Wissenschaft • Praxis • Perspektiven

Original Article · Originalarbeit

Forsch Komplementärmed 2006;13:000–000
DOI: 10.1159/000090480

Published online: January 5, 2006

Randomized Double-Blind Pilot Study on Psychological Effects of a Treatment with 'Instrumental Biocommunication'

Rainer Schneider Harald Walach

Institute for Environmental Medicine and Hospital Epidemiology and Samueli Institute Europe, University Hospital Freiburg, Germany

Key Words
Health · Placebo · QUANTEC® · Self-report · Well-being

Summary
Background and Objective: Computerized systems using instrumental biocommunication for treatment claim beneficial health effects. We set out a pilot study to test whether individuals treated with a program called QUANTEC® report improvements in well-being, health, and fulfillment of prerecorded wishes. **Materials and Methods:** 34 volunteers from the University Hospital Freiburg participated in the study. Before treatment, baseline measures were taken (self-report on wishes, well-being, and health). Participants were then randomly and blindly allocated to two groups. In the first treatment phase of 3 months duration, only half of the participants were treated (group 1). Upon the end of the first treatment phase, post-treatment measures were taken. Participants were then unblinded as to group allocation and group 2 was treated. Finally, the second post-treatment measures were taken. **Results:** Data exploration revealed that individuals' need for health improvement and blinding may be important psychological prerequisites for a treatment with instrumental biocommunication to be beneficial. **Conlusions:** Treatments with QUANTEC may be accompanied by beneficial health effects. The latter do not necessarily bear on postulated causative mechanisms of treatments with instrumental biocommunication but might instead be purely psychological in nature. However, there are a number of limitations as to the quality and quantity of such effects which calls for further investigation.

Schlüsselwörter
Gesundheit · Plazebo · QUANTEC® · Selbstauskunft · Befindlichkeit

Zusammenfassung
Hintergrund: Computerisierte Systeme für Biokommunikation nehmen für sich in Anspruch, förderliche Heileffekte auszulösen. In einer Pilotstudie unterzogen wir diese Aussage einer Prüfung, indem wir von einem solchen System (QUANTEC®) behandelte Personen in Selbstauskünften nach Verbesserungen in Allgemeinbefinden und Gesundheit sowie Erfüllung vorformulierter Wünsche befragten. **Material and Methoden:** 34 Freiwillige des Universitätsklinikums Freiburg nahmen an der Untersuchung teil. Vor der Behandlung wurden die Baseline-Daten erhoben (Selbstauskunft über Wünsche, Allgemeinbefinden und Gesundheit). Die Teilnehmer wurden randomisiert und verblindet zwei Gruppen zugeteilt. Die Hälfte wurde während der ersten, 3 Monate dauernden Phase behandelt (Gruppe 1). Nach Beendigung dieser Phase wurden die Post-Treatment-Daten erhoben. Alle Teilnehmer wurden anschliessend in Bezug auf die Gruppenzuordnung entblindet, und Gruppe 2 wurde für die gleiche Dauer behandelt. Danach wurden die zweiten Post-Treatment-Daten erhoben. **Ergebnisse:** Die Datenexploration zeigte, dass Bedürftigkeit und Verblindung wichtige psychologische Bedingungen für eine Behandlung mit instrumenteller Biokommunikation sein könnten. **Schlussfolgerungen:** Die Behandlung durch QUANTEC kann von förderlichen gesundheitlichen Effekten begleitet sein. Diese müssen nicht ursächlich auf postulierte Wirkmechanismen der instrumentellen Biokommunikation zurückgehen, sondern könnten rein psychologischer Natur sein. Es besteht jedoch eine Reihe von ungelösten Fragen, die sowohl Qualität als auch Quantität solcher Effekte betrifft.

KARGER

Fax +49 761 4 52 07 14
E-mail Information@Karger.de
www.karger.com

Accessible online at:
www.karger.com/fkm

Dr. Rainer Schneider
University Hospital Freiburg
Institute for Environmental Medicine and Hospital Epidemiology
Hugstetter Str. 55, 79106 Freiburg, Germany
Tel. +49 761 270 722-5, Fax -4
E-mail rainer.schneider@uniklinik-freiburg.de

Background

From the various complementary and alternative therapies, biofield therapies form one major domain. They are intended to affect energy fields purportedly surrounding and penetrating the human body, e.g. by manually manipulating the body. Whilst these treatments require a therapist, commercially available devices, which have been developed as an alternative method, do not. In the past decade, this market has seen a waxing demand for automatized treatments with such so called instrumental biocommunication. They employ physical methods which are, as yet, controversially debated regarding both their rationale and their effectiveness. Starting from the assumption that all life forms exist in electromagnetic fields, which themselves are connected to similar fields respectively, instrumental biocommunication devices claim to restore disturbed ('unhealthy') fields with electromagnetic radiations [1–3].

Presumably, the first scientist to systematically employ instrumental biocommunication was the American medical doctor Albert Abrams at the beginning of the last century [4]. He observed that patients, upon whom he performed percussions, showed altered resonance sounds when they were situated near an enabled x-ray device. Since the location of the patient appeared to be associated with these alterations (North-South positions did not produce modified sounds) he concluded that the magnetic field of the earth and that of humans were somehow linked. Further investigations lead him to conclude that not only rays stemming from the x-ray device but also 'vibrating' molecules, e.g. from cancer carcinoma, made patients react with muscle contractions, for instance in the upper abdominal region. Since healthy persons would show similar effects when exposed to pathogenetic tissue, he claimed that individuals were connected to each other via hitherto unknown rays. Henceforth, he put a lot of effort in both developing electrical devices, which purportedly diagnosed wavelengths of manifold diseased tissues, and constructing electrical devices, which were to treat patients with emitting radiation. Abrams was only granted short-lived success, his devices were soon deemed bogus and his claims never managed to be scientifically accredited.

Today, treatments with instrumental biocommunication enjoy an ever growing community of customers [5]. They deploy electromagnetic fields, informed with oscillations of e.g. homeopathic remedies, which are assumed to be transferable to any given target. The physical principle used is induction, i.e. electric current produced by magnetic fields, and it is claimed that defective fields surrounding objects are restored through 'healthy' radiations. Whilst the validity of this claim is scientifically still lacking, many people do in fact report significant improvements after treatments with instrumental biocommunication. Unfortunately, these reports are anecdotal in the first place, and can be retrieved primarily from informal testimonies, e.g. in commercial brochures etc. Particularly, it is unclear whether improvements associated with these treatments stem from the mechanism posited or whether they derive from psychological mechanisms. In fact, psychological factors can be thought to be powerful over and above alleged physical effects. Individuals seeking alternative treatments often carry with them a broad range of hopes, needs, and beliefs which may bring about beneficial effects in and of themselves. Evidence from placebo research shows that expectation and meaning elicit bodily and mental effects comparing to those of active treatments [6–9]. For such effects to occur it has been shown that awareness of the treatment is an important prerequisite. Put differently, individuals oblivious to being treated do not show placebo effects. Conversely, awareness has also shown to be important in the treatment with active pharmaceutical agents because surreptitiously applied treatments may fail to exert effects [10].

Thus, it may be contended that psychological factors play an important role for treatments with instrumental biocommunication to show an effect. However, there appears to be no empirical research addressing the tenability of this assumption. To provide a preliminary answer to this issue, we set out a pilot study exploring whether participants' awareness of the treatment with instrumental biocommunication affected self-report measures.

Materials and Method

Experimental Design

The pilot study employed a randomized waiting group design with an open treatment of one group (N = 17) being treated for a period of 3 months with a commercially available software for instrumental biocommunication. The waiting group (N = 17) served as the control group. Upon completion of the first treatment, all participants were unblinded as to group allocation and the waiting group was also treated for 3 months. In total, there were three measurement points, baseline (t_0: before treatment), first post-treatment measurement (t_1: after 3 months), and second post-treatment measurement (t_3: after 6 months).

Sample

The sample consisted of N = 34 participants from the Institute for Environmental Medicine and Hospital Epidemiology at the University Hospital Freiburg, Germany, responding upon an in-house call for a free-of-charge computer treatment experiment. The sample comprised 15 males and 19 females. The mean age was 40 years (SD 7, range 26–55). The unsolicited participation in the study was not remunerated.

Rationale and Procedure

Our pilot study aimed at testing the assumption that *psychological* factors significantly contribute to measurable effects of treatments with instrumental biocommunication. To this end, we employed a commercially available software program called QUANTEC® (M-TEC Corp.; Altkirchen, Germany) which was handled by the company itself during the entire treatment period. The software is designed to simulate biological systems which may interact with other biological systems (biocommunication). The interfaces enabling 'communication' are based on principles analogous to those found in entanglement of twin photons and on diodes producing 'white noise'. Assuming that e.g. photographs are entangled with the individuals they depict, the software generates a virtual photo-

Table 1. Mean (SD) of 'General health' and 'Well-being'

	Overall sample (N = 34)						'Needy' sample (N = 10)					
	t_1[a]		t_2[b]		t_3[c]		t_1		t_2		t_3	
	Group 1	Group 2	Group 1	Group 2	Group 1	Group 2	Group 1	Group 2	Group 1	Group 2	Group 1	Group 2
Health	3.8 (0.6)	3.8 (0.7)	3.9 (0.6)	3.9 (0.7)	4.0 (0.5)	3.8 (0.7)	3.0 (0.1)	2.8 (0.5)	3.4 (0.5)	3.6 (0.9)	3.6 (0.6)	3.8 (0.9)
Full of drive	3.4 (1)	3.8 (1.1)	3.9 (1.1)	3.9 (1)	3.8 (1)	3.9 (1.1)	2.8 (0.9)	3.0 (1.2)	3.8 (0.9)	3.8 (0.9)	3.4 (0.9)	3.8 (1.3)
Nervous	2.4 (0.7)	2.7 (1)	2.1 (0.7)	2.4 (0.6)	2.2 (0.7)	2.5 (1)	2.6 (0.9)	3.0 (1.4)	2.0 (0.1)	2.6 (0.5)	2.4 (0.5)	2.4 (0.9)
Down	2.8 (1)	2.7 (0.9)	2.7 (0.8)	2.4 (0.7)	2.3 (0.6)	2.5 (0.9)	3.0 (1.2)	3.2 (1.3)	3.0 (0.1)	2.8 (0.4)	2.6 (0.5)	2.4 (0.5)
Calm	3.5 (0.7)	4.1 (0.9)	3.9 (1.2)	4.1 (0.9)	3.9 (0.9)	3.8 (1.1)	3.2 (0.4)	4 (1.4)	3.2 (1.1)	4.6 (1.1)	3.4 (0.5)	4.2 (1.1)
Energetic	3.3 (1.1)	3.5 (1.4)	4 (1.1)	3.7 (1)	3.7 (1.1)	3.5 (1.2)	2.6 (0.5)	2.2 (0.8)	3.6 (1.1)	3.4 (0.5)	3.2 (1.1)	3.4 (1.1)
Sad	2.9 (1)	2.8 (1.1)	2.3 (0.9)	2.4 (0.7)	2.3 (0.7)	2.3 (1)	3.0 (1.2)	3.2 (1.6)	2.6 (0.5)	2.2 (0.5)	2.4 (0.9)	2.2 (0.8)
Exhausted	3 (1)	3.2 (1.1)	2.5 (0.7)	3.1 (0.7)	2.8 (0.9)	3.3 (0.9)	3.6 (0.5)	4.4 (1.1)	2.8 (0.8)	3.6 (0.5)	3.2 (0.8)	3.4 (0.5)
Happy	3.4 (1)	3.8 (1.2)	3.6 (1.1)	3.8 (1)	3.8 (1.1)	3.7 (1)	3.0 (0.7)	3.6 (1.7)	3.0 (0.7)	3.8 (1.1)	3.2 (0.8)	3.6 (0.9)
Tired	3.3 (1)	3.6 (0.9)	3.2 (1.2)	3.4 (0.6)	3.1 (0.7)	3.4 (0.7)	3.8 (0.4)	4.4 (1.1)	3.4 (0.9)	3.8 (0.4)	3.6 (0.9)	3.4 (0.5)

[a]Baseline; [b]after 3 months; [c]after 6 months.

graph data base which is 'treated' with e.g. self-generated wishes. Additionally, QUANTEC retrieves information from various disease and disorder data bases as well as sociodemographic data from the individual. By employing the white noise from the diode, the biofield of the individual is scanned, and chosen remedies are 'transferred' onto the individual.

Prior to the start of the study, each participant was digitally photographed. Together with individually prerecorded and undisclosed wishes (see below), this material was sent to M-TEC Corp. The CEO of M-TEC Corp., Peter-Raphael von Buengner, numbered each envelope and allocated participants to two groups according to a randomization scheme provided by RS. Both the wishes and the digitized photographs, attached with each individual's initials, were fed into the QUANTEC software which ran continuously for a period of 3 months per group. Both RS and HW had neither knowledge of the group allocation nor the content of the wishes. Before any treatment, baseline measures were taken. After the first treatment phase of 3 months, in which participants were informed to have a 50% chance to belong to the treatment group, post-treatment measures were taken. The non-treated group served as a control group. After all data were gathered, PVB broke the group allocation code and participants were unblinded. The second group, fully aware of the treatment, was then treated for the consecutive 3 months whereby Group 1 served as the control group. This was done to warrant both equity of treatment and to compare different degrees of treatment awareness. After treatment, the second post-treatment measures were taken.

Goals of the Study

This pilot study was set up to explore quantifiable effects in self-reports of volunteering participants treated with the biocommunication computer system QUANTEC for a continuous period of 3 months. The design employed was *not* applied to investigate the causative mechanisms postulated for biocommunication treatments but rather the psychological concomitants involved. To do so, we varied one basic factor (i.e. awareness) to see whether it had any effect on self-reports of fulfillment of wishes, improvement of well-being, and overall health.

Variables

Independent Variable: Awareness of treatment with QUANTEC (Group 1: 50% certainty; Group 2: 100% certainty).

Dependent Variable: (1) General Health (6-point Likert Scale ranging from very bad to very good). (2) Well-being (7-point Likert Scales from the SF 36 [11], i.e. full of drive, nervous, down, calm and relaxed, energetic, disappointed and sad, exhausted, happy, tired, ranging from never to always). (3) Fulfillment of wishes in the areas bodily well-being, mental well-being, social environment, and vocational environment (6-point Likert Scale ranging from not at all to completely). (4) Well-being after treatment compared to before (5-point Likert Scale ranging from much worse to much better).

Moderator variables: (1) Meaning of wishes (5-point Likert Scales ranging from very low to very strong). (2) Expectation of fulfillment (5-point Likert Scales ranging from very low to very strong).

Ethics and Consent

The study was conducted according to the declaration of Helsinki. The Ethics Committee of the University Hospital Freiburg did not see any need to have the study formally assessed since no commonly accepted biomedical or pharmaceutical treatment was involved. All participants were fully aware of the nature of the study, participated on a voluntary basis, and approved their agreement with written consent.

Hypotheses

(1) Treatment with the biocommunication computer system QUANTEC is accompanied with improvement of general health and well-being. (2) Full awareness of the treatment is accompanied with larger increases of improvements of general health and well-being. (3) Treatment with QUANTEC is accompanied with fulfillment of prerecorded wishes in the areas of bodily well-being, mental well-being, social environment, and vocational environment. (4) Meaning and expectation have a modulating (enhancing) impact on fulfillment of wishes.

Results

Due to the nature of the design we applied 2 (group) × 3 (repeated measurement) ANOVAs to determine treatment effects. They were performed upon the variables 'general health' and 'well-being'. The only significant effects showed for the well-being scales 'calm and relaxed' and 'disappointed and sad'. For the first variable, the interaction term reached statistical significance ($F(1, 31) = 6.63$; $p = 0.015$), indicating that both groups differed with regard to baseline but not with regard to the treatment. For the second variable, the factor time was significant indicating that all participants were more

disappointed and sad at baseline than after 3 and 6 months ($F(1, 31) = 8.76$; $p = 0.006$). However, since only Group 1 was treated during the first 3 months, improvements in Group 2 were not attributable to the QUANTEC treatment but rather reflected involvement of a psychological factor (see table 1).

The variables 'fulfillment of wishes' and 'well-being after treatment' compared to before were analyzed with 2 (group) × 2 (repeated measurement) ANOVAs. None of the calculations turned out to be significant (all $F < 1.7$). Hence, contrary to our assumptions there was no support for the notion that the treatment with QUANTEC exerted a genuine beneficial influence on general health and well-being (Hypothesis 1) and fulfillment of wishes (Hypothesis 3).

To better account for the exact timeline of the two treatments we recalculated the data with modified baseline and post-treatment measures. Specifically, since Group 2 had only been treated after 3 months, we treated the first post-treatment measurement (t_1) as baseline. This allowed better comparing the two groups with regard to awareness of the treatment. When performing 2 (group) × 2 (repeated measurement) ANOVAs we obtained significant results for the variables 'calm and relaxed' ($F(1.32) = 5.3$; $p = 0.028$) and 'energetic' ($F(1.32) = 6.06$; $p = 0.019$) as well as a marginally significant result for 'exhausted' ($F(1.32) = 4.07$; $p = 0.052$). All effects showed as interaction effects such that Group 1 reported improvements from baseline to post-treatment whilst Group 2 showed deteriorations, respectively (see fig. 1). Thus, contrary to hypothesis 2, full awareness of the treatment appeared to attenuate the effect. A reanalysis for the variables 'fulfillment of wishes' ($t(32) < 1.6$) and 'well-being after treatment compared to before', however, yielded no significant results ($t(32) = 0.01$).

To decide whether expectation and meaning of the treatment had a modulatory impact on fulfillment of wishes, one-tailed correlations were performed accounting for the group specific treatment timelines (i.e., t_1 for Group 1 and t_2 for Group 2). The results showed that expectation for the mental area was positively correlated with fulfillment of these wishes ($r = 0.37$; $p = 0.017$). Regarding meaning, there was a positive correlation with the mental area ($r = 0.35$; $p = 0.02$) and the vocational area ($r = 0.34$; $p = 0.02$). Hypothesis 4 was further explored for differences between participants regarding expectations and ratings on meanings of the four areas, the sample was split according to the medians of the variable 'fulfillment of wishes' (Group 1: t_1; Group 2: t_2). Significant differences were found for the expectation in the bodily area ($t(32) = 1.89$; $p = 0.034$), meaning of the mental area ($t(32) = 2.04$; $p = 0.025$), expectation of the mental area ($t(32) = 1.77$; $p = 0.04$), as well as meaning of the vocational area ($t(32) = 1.71$; $p = 0.048$).

Data Exploration

Because the very nature of a treatment with instrumental biocommunication is to restore disturbed states, yet the majority of our sample participated for reasons of curiosity and interest, we performed analyses with a smaller sample reporting general health to be less well or worse at baseline ($N = 10$; 5 of either group). We then reapplied 2 (group) × 3 (repeated measurement) ANOVAs to determine treatment effects. The analyses for 'general health' yielded a highly significant main factor measurement indicating improvement in both groups from baseline to t_1 ($F(1.8) = 14.4$; $p = 0.005$) and from t_1 to t_2 ($F(1.8) = 6.9$; $p = 0.030$). Likewise, for 'well-being' indices only main factors for measurement were found. Both groups reported to have more 'drive' at t_1 compared to baseline ($F(1.8) = 6.0$; $p = 0.040$), to be less 'down' ($F(1.8) = 10.5$; $p = 0.012$) at t_2 compared to t_1, and to be more 'energetic' ($F(1.8) = 8.9$; $p = 0.017$) and less 'exhausted' ($F(1.8) = 9.1$; $p = .016$) at t_1 compared to baseline (cf. table 1). Analyses of fulfillment of wishes showed that this sample also reported fulfillment of all wishes reflecting on average a rank of 'slightly' (bodily area: ($t(9) = 2.88$; $p = 0.009$; mental area: ($t(9) = 3.86$; $p = 0.002$); social area: ($t(9) = 4.07$; $p = 0.002$); vocational area: ($t(9) = 3.0$; $p = 0.008$).

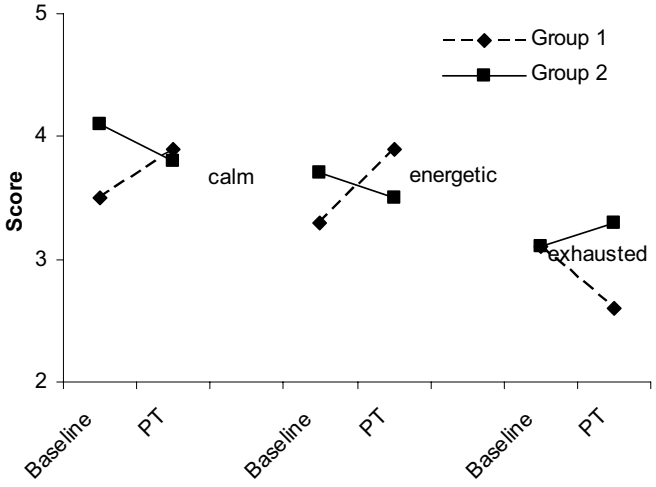

Fig. 1. Interaction effects of group × well-being; PT: post-treatment measures.

Discussion

On the basis of our results, we conclude that the QUANTEC treatment was not associated with effects independent of psychological factors. Furthermore, the differences found for participants' well-being before and after the treatment only showed for some parameters and after accounting for group-specific baseline differences. They point to psychological factors which might be an important prerequisite for treatment effects to show. However, whether the results are genuine or derive from other effects associated with the nature of the study is open to speculation. For example, it could be argued that both groups differed with regard to attitudes toward the study or incurred time effects which confounded self-report,

like e.g. memory biases or loss of interest. Nonetheless, if reproduced there is little support for the notion that awareness exerts an enhancing impact on treatment success. To the contrary, it even seems to impede it. On the other hand, meaning and expectation appear to exert a modulating effect on the QUANTEC treatment. Yet, the correlations observed were rather small and not to be found across all areas measured. Although expectation and meaning were able to differentiate between two groups reporting high and low fulfillment of wishes it should be kept in mind that the median splits corresponded to a qualitative distinction of 'rather great' and 'great' (i.e., almost all participants attributed great meaning and expectation to their wishes).

The data exploration indicated need, defined as deviation from an optimal health status, to be an important prerequisite for the QUANTEC treatment. That the effects shown for the 'needy' sample were again rather psychologically determined was corroborated by the consistent finding of measurement main effects. These differences seemed to be quantitatively different than in the total sample as indicated by the larger ranges across all significant variables from 0.8 to 1.1 ranks (mean 0.9) as opposed to a range of 0.3 to 0.7 ranks (mean 0.5). In order to be genuine treatment effects associated with the posited QUANTEC mechanism, we would have had to find group differences such that Group 1 experienced improvements from baseline to t_1 (after 3 months), and Group 2 from t_1 to t_2 (after 6 months), respectively. The conclusions derived for the need issue only have tentative character because the sample size was rather small (N = 10) and the results stemmed from post hoc analyses which do not warrant full validity. On the other hand, one may suspect if individuals already doing well at the onset of such a study will at all show further improvements. We therefore think that future studies should follow-up on this issue.

In sum, there is preliminary support for the claim that participation in a QUANTEC treatment promotes quantifiable (experiential) improvements in self-report measures. However, there are a number of limitations to this claim which should be heeded in future research of this kind. For example, from the range of variables taken only some showed differences, from which some could only be found when the data were further explored. Furthermore, the sample size was rather small and highly selective and effects found could have been produced by biases. Also, the significances found could have been the result of statistical fluctuations which could only have been accounted for by inclusion of a control group receiving no treatment. Finally, the number of tests applied was relatively large promoting the risk of multiple testing. Apart from these statistical issues, there are additional restrictions with regard to the general validity of self-reports. Specifically, confounds like selection or memory artifacts, biasing factors (e.g. actual motivation and experiences), or introspective abilities might have invalidated the data.

From a practical point of view, however, it is interesting to note that the beneficial effects observed argue for psychological factors as causative mechanisms in the first place. The differences which surfaced in the experimental groups (i.e. awareness) showed as interaction effects. This implies that receiving such a treatment which, according to established standards, is unusual brings about changes in self-experience, expectations, and attitudes in and of itself. Need may further enhance such changes. That informed awareness may exert a corrupting influence is an interesting finding which, although not expected a priori, may be found in placebo research also. In several meta-analyses it could be demonstrated that placebos used as mere controls deteriorate beneficial placebo effects [8, 12, 13]: In other words, individuals knowing to be treated with placebo usually don't show a placebo effect (e.g., changes brought about by self-healing). That awareness, on the other hand, does not produce such interaction effects in needy individuals, appears to contradict this line of reasoning. Note, however, that most of the effects for health status and general well-being in the 'needy' sample were found from baseline to t_1 at which point in time all participants were still blind as to the group allocations. This confirms the herein asserted view that uncertainty could in fact be of great importance for treatment success.

Should this finding turn out to be replicable, individuals can be assumed to profit the most from treatments with instrumental biocommunication like with QUANTEC when they are to some degree ignorant to specific parameters of the treatment (nature, start/end, quality).This somehow calls into question current practice with the individuals being fully aware of the treatment. On the basis of the results of this study, treatment effects would be maximized with blinding as this was done for Group 1 where the probability to be treated in a given time period was 0.5. On the other hand, real clinical neediness appears to be a necessary prerequisite for these effects to operate at all. Whether this is more than a regression-to-the-mean effect remains to be seen and can only be studied in a truly clinical sample, which we did not have.

Inasmuch as success criteria are primarily derived from self-report measures, net gains, e.g. in health and well-being, should not be expected to be too large. Although being statistically significant, such gains may be of minor importance clinically or practically. Possibly, more objective criteria would turn out to provide more accuracy with regard to relevant changes. From a psychological stance, it may be helpful to assess additional variables, like the attitude towards treatment with instrumental biocommunication, well-being at the onset of treatment, or beliefs, which could act as important moderators for treatment outcomes. However, further research will be needed to require evidence for these claims.

Acknowledgement

This study was supported by M-TEC AG, Altkirchen, Germany. RS and HW are employed by the Samueli Institute, Alexandria, VA, USA.

References

1 Bergsmann O: Bioelektrische Phänomene und Regulation in der Komplementärmedizin. Wien, Facultas, 1994.

2 Hartman JE: Radionics and Radiesthesia: A Guide to Working with Energy Patterns. Placitas, NM, Aquarian Systems, 1999.

3 Tansley DV, Westlake R, Westlake A: Dimensionen der Radionik: ein Handbuch der radionischen Theorie und Praxis für die Gesundheitsberufe. Nienburg, Radionik, 1999.

4 Tansley DV: Dimensionen der Radionik – Neue Techniken instrumentengestützten Fernheilens. Nienburg, Radionik, 1999.

5 Russel EW: Report on Radionics: Science of the Future. Walden, CW Daniel, 1997.

6 Moerman DE: Meaning, Medicine and the 'Placebo Effect'. Cambridge, University Press, 2002.

7 Schneider R: Placeboeffekt und Bedeutung – Eine funktionalpsychologische Betrachtung. Psychol Rundsch 2005;56:201–209.

8 Vase L, Riley JL, Price DD: A comparison of placebo effects in clinical analgesic trials versus studies of placebo analgesia. Pain 2002;99:443–52.

9 Walach H, Jonas WB: Placebo research: The evidence base for harnessing self-healing capacities. J Altern Complement Med 2004;10:103–12.

10 Benedetti F: The opposite effects of the opiate antagonist Naloxone and the Cholecystokinin antagonist Proglumide on placebo analgesia. Pain 1996; 64:535–43.

11 Bullinger M, Kirchberger I: SF-36 Fragebogen zum Gesundheitszustand. Göttingen, Hogrefe, 1998.

12 Baskin TW, Tierney SC, Minami T, Wampold BE: Establishing specificity in psychotherapy: A meta-analysis of structural equivalence of placebo controls. J Consult Clin Psychol 2003;71:973–79.

13 Lee S, Walker JR, Jakul L, Sexton K: Does elimination of placebo responders in a placebo run-in increase the treatment effect in randomized clinical trials? A meta-analytical evaluation. Depr Anx 2004;19:10–19.