

Combining ancient and modern: The power of Intention in increasing engagement in Pranayama practice

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ABSTRACT

Background: A feasibility study using trial methodology comparing the impact of two behavioural motivational interventions on intention to practice and engagement with pranayama and perceived wellbeing a week after the intervention.

Materials and methods: Healthcare professionals, from mainstream and complementary disciplines were randomised into one of two motivational conditions, Pranayama with an Implementation Intention statement and Pranayama with a Benefits Analysis statement. Interventions were delivered via Qualtrics which embedded an unlisted YouTube demonstration for different conditions. A qualitative analysis of the self-generated statements was conducted alongside a quantitative analysis for general wellbeing based on outcome from the WHO-5, and measures of affect, motivation, capability, and opportunity.

Results: 155 participants showed an interest in the study, with an intention to treat (n=84) analysis performed. Both motivational messages were associated with increased practice and intention to practice pranayama over time, an increased sense of capability and opportunity for practise, limited impact on emotional regulation and no change in general wellbeing. Qualitative findings showed implementation intention effectiveness is not necessarily based on verbatim remembering, subjective benefits experienced were mainly emotional, or a combination of somatic and emotional; that challenges of working in healthcare environments possibly block implementation intentions from being used effectively.

Conclusion: This one-week intervention was adequate to increase practise and intention to practise pranayama. An adequate number of people participated in this study; study retention was high. Participants were highly motivated and the main barriers to engagement linked to capability and opportunity. Further exploration about the mechanism that encourages people to practise pranayama in different settings is required.

1. Introduction

A recent NHS staff survey indicates that forty-seven and thirty-four percent of staff are unwell as a result of work-related stress and burnout, respectively [1], drawing attention to a requirement to manage the psychological wellbeing of this group [2]. Self-regulation is important for self-care and can often be affected by stress and other factors [3]. The current research is underpinned by proactive self-care [4], and the use of behavioural change techniques (BCTs) [5] that could assist healthcare professionals to engage in self-care practice. This study focuses on implementation intentions (II) and the impact these have on encouraging pranayama practise (one arm of yoga), otherwise known as deep breathing, which has a positive impact on psychological, physiological, and neurological markers of stress and wellbeing [6] and

increases the parasympathetic response [7].

This study is underpinned by the theory of planned behaviour (TPB), with intention as a pivotal in behaviour change, as [8]. Implementation intention (II) is an established method for enhancing intention which goes beyond goal setting, and which is focused on what is intended to be achieved [9]. This intention-setting method involves a person formulating a critical situation and a proposed action to address the critical situation [10] as an if-then statement, e.g., If there are stairs, then I will take them. Implementation intentions (IIs) theoretically work on a subconscious level, yet, unlike habits, they are not influenced by previous cue-response links [11] and are therefore less susceptible to forgetting, failure to seize an opportunity to act and reluctance to act [12]. A postulated mechanism for implementation intentions (IIs) is that they augment metacognitive process such as planning, checking,

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monitoring, and regulating problem solving behaviour, thereby reducing resources required in these areas for action to take place [13]. This is supported by research where II has moderated other BCTs such as mental contrasting [14].

The art of motivational messaging is challenging, with it suggested that direct motivational messages can be perceived as too coercive and reacted to negatively, hence weakening interventions [15]. This indicates the importance of a personalised approach to message delivery, which IIs endeavour to create. Although IIs and reinforcement of messages has been shown to effect behaviour, this frequently focused on health behaviours such as physical activity (Da [16]), and there is no understanding of how IIs may impact a positive health practice such as pranayama practice. Although variability is seen with regards to short- and long-term effects in study designs comparing motivational change strategies of II and goal planning ([17]; A. [18]), with some research finding no differences [19], it is argued that if an implementation is likely to be effective, then this would be expected to happen in the immediate-term.

This feasibility study explored the impact of forming an II on the ability to engage with pranayama practice for work-based challenges amongst healthcare professionals, and whether this will be associated with more positive emotions, calmer perceived physiological states and enhanced wellbeing compared to a control group at one-week follow-up. This will be tested by comparing healthcare professionals who receive Pranayama with Implementation Intention (PII) with a control group who receive Pranayama without II (PBA). Pranayama is often fused with other dimensions of yoga in research [20] with this study purposively focusing on pranayama solely to reduce ambiguity with regards to effective components of an intervention.

This feasibility study heeded guidance for interventions with a physically active component, in this case pranayama, and focused on process, advancing scientific inquiry, as well as attention to resources [21]. It specifically aimed to inform process via understanding recruitment capability through monitoring uptake and of attrition rates and documenting demographic information of professionals recruited. It sought to understand the acceptability of a digital intervention which combined pranayama and a BCT (either implementation or goal-planning), both underpinned by separate evidence-base, respectively [22,23]. Acceptability and feasibility will be clarified by consistency of IIs from baseline to follow-up, self-reported benefits of IIs and goal planning, and challenges with interventions to gauge context-related and other factors which might illuminate possible mechanisms of change and factors impeding the success of future large-scale studies. Lastly, scientific inquiry linked findings with the COM-B model of behaviour change [24] and effect on short-term emotional and general wellbeing. In-vivo changes to the study, not atypical in feasibility research, were not made given possible foreseen challenges to recruitment which occurred early in 2021, during the Covid-19 pandemic.

The study tested the following hypotheses:

Hypothesis 1. : Healthcare professionals in the pranayama with implementation intentions (PII) intervention will experience greater motivation, opportunity, and capability for pranayama practice, and engage in increased practice compared to those in the control group (PBA)

Hypothesis 2. : Increased pranayama practice in the PII intervention will be associated with more positive emotions and greater wellbeing and will strengthen all behavioural change domains (capability, opportunity, and motivation).

In addition, the study explored whether implementation intentions were self-generating. To the authors' knowledge, this is the first study to explore the impact of IIs, on the ability to engage with pranayama practice, as an evidenced-based practice [25].

2. Methods

2.1. Study design

This pilot study used a randomized controlled study design with a two-group, experimental – Pranayama with Implementation Intention (PII) vs. control - Pranayama with Benefits Awareness (PBA) group and 2 time point, baseline (T1), post- intervention (T2) study design, yielding a between-groups comparison condition. A mixed methods approach was used for collected and analysed qualitative and quantitative data for T1 and T2. Dependent variables measured over the intervention week (T1-T2) were intention to practice and engagement in pranayama practise, positive and negative affect (happiness, calm, alert/focused, fear, sadness, numb), and change in perceived capability, opportunity, and motivation to engage in pranayama practice. Implicit in the design was a control for experience of pranayama with participants invited to participate if they had previous experiential knowledge.

2.2. Setting and sample

According to the suggestion of Thabane et al. [26] to set a target for participation and retention for which to proceed with further investigation, the authors set a recruitment target of 20 and retention-rate of 50 for the intervention and control group. Given no existing studies focused on pranayama and implementation intention, a study focused on physical activity was consulted for sample size calculation. Based on an effect size difference between control and intervention groups of Cohen's $D=.63$ [27], an anticipated reduced pooled effect size of .30 (given this is a feasibility study with one validated measure), alpha of .05, and CI of 95 %; the required sample size for each group was 20.

2.3. Data collection instruments

Data was collected via an online questionnaire which included demographic, psychometric measures, and open-ended questions

Demographic data. At baseline, demographic data on gender, ethnicity, age, profession, profession group, length of time in service, and previous pranayama experience and amount of practice during the last week was collected.

Psychometric measures explored the following at T1 and T2:

1. Visual analogue scale (VAS): frequency and intention to practise pranayama, perceived pleasantness, sense of energy, rating of positive and negative affect (7 emotions).
2. WHO-5 [28]: General wellbeing.
3. A 5-point Likert scale: specific statements were created to explore capability, opportunity, and motivational dimensions of pranayama engagement, linked to COM-B model of behaviour change [29].

Open ended questions explored a) implementation intentions created (T1) and whether these were present at follow-up (T2), b) perceived benefit and challenge from pranayama practise (T2), c) whether implementation intention or benefits had popped up in their mind during the past week and d) whether participants had been able to monitor work based and non-work-based challenges (a-d represented an indirect measure of the effectiveness of the intervention messages). Response to COM-B based statements and open-ended questions were measured the 'dynamic acceptability' [30] of the intervention given responses were indicative of participants' experience of the intervention.

2.4. Data collection

This study used "snowball" sampling [31] by approaching NHS health and mental health practitioners, complementary health practitioners and established yoga teachers known to the author and

encouraging them to share the invitation to participate with their colleagues. The researcher emailed 73 personal contacts who work in healthcare alongside advertising the study on the personal Facebook page. Inclusion criteria included: identifying as a healthcare professional, having had some pranayama practice previously (thereby controlling prospective acceptability), and be willing to practice pranayama prompted by challenging work situations for the next week. Following informed consent and completion of baseline questionnaires, participants were randomly assigned to one of the two conditions: an Implementation Intention group and a Benefits Awareness control group via Qualtrics software [32]. Each group completed a set of measures at baseline and post intervention and watched a video as part of the

baseline measures to help support their pranayama practice. A brief instructional video, dependent on which group participants had been allocated, was sent to participants via email after completion of baseline measures for use during the intervention week. Participants received a reminder email seven days after baseline prompting them to complete the study questionnaires again.

2.5. Intervention

Both Intervention and control group received a brief statement about the scientific evidence behind pranayama and its benefits provided by the researcher who is also a yoga teacher. The intervention group (PII)

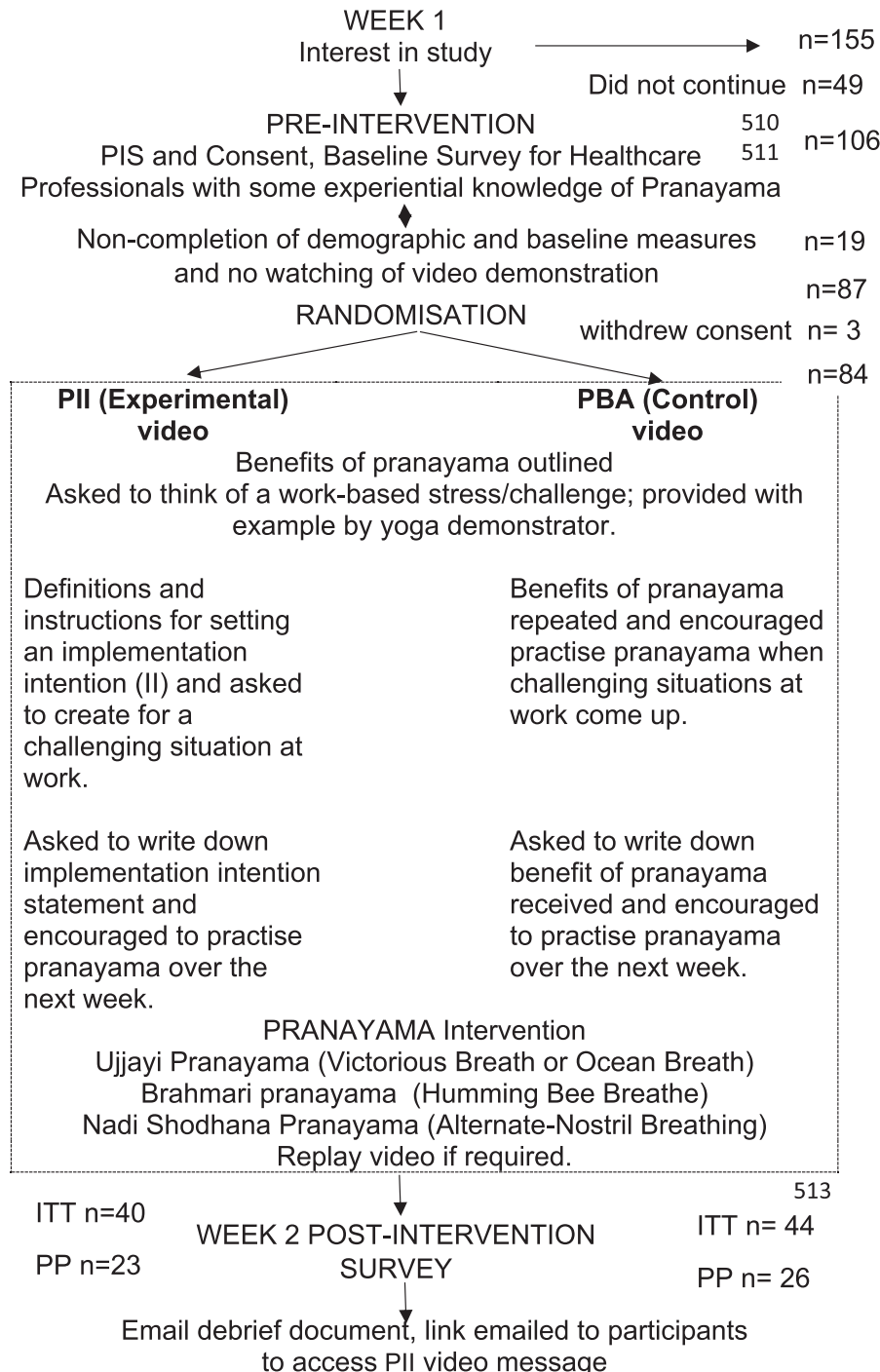


Fig. 1. Flow chart of breathe and change.

were asked to set a specific implementation intention (II) linked to a personal challenge/difficulty at work and encouraged to use pranayama at that time, and record this at baseline as a survey response. As a motivational control, the control group (PBA) were asked to notice and write the benefits of practising pranayama for challenging situations arising at work (as a survey response) and encouraged to practise pranayama during the week. See Fig. 1 for intervention components, including specific pranayama practise. Encouragement was surreptitious in style so as not to provide a coercive or instructional message which it was felt might backfire. Intervention times for each group were comparable: implementation intention (13:38 mins), benefits awareness (14:06 mins). Based on the premise that lengthy interventions are impractical for healthcare professional working contexts, and deep-breathing can generate effects from as little as 5 minutes [33] the pranayama intervention was brief and proceeded by the implementation intention or benefits message. The recorded intervention and control messages and accompanying scripts were reviewed by an academic supervisor for comparative suitability.

2.6. Evaluation of data

According to advice to set a target for participation and retention for which to proceed with further investigation [26], the authors set a recruitment target of 20 and retention-rate of 50 for the intervention and control group.

2.7. Quantitative analysis

An intention to treat (ITT) and per protocol analysis (PP analysis) was undertaken for primary repeated measures to ascertain differences between those professionals who completed the study and those that did not. Only ITT analysis is reported in this paper. The ITT sample included all participants that were randomised to a condition, indicated by them having watched a PII or PBA demonstration video. Participants were not included in the ITT if sample if they wished to withdraw from the study due to illness or not having pranayama experience. Access to video demonstration during the intervention week attempted to control for existing difference in expertise amongst practitioners, a factor not often addressed in research. This study did not have a no treatment control group.

The ITT analysis included participants (i) completing T1 and T2 measures and providing II or benefits statements, (ii) not documenting II or benefit statement at baseline or providing a statement did not reference the intervention in anyway, and (iii) who did not participate in follow-up. For participants not completing follow-up at all, baseline scores were used for T2. Where participants did not complete a follow-up survey (T2) the last observation carried forward assumption (LOCF) was used as a conservative measure of response. For participants who attempted follow-up yet had missing at random responses, a series mean was substituted for the missing response variable according to randomised group [34]. Baseline and post intervention data were matched via anonymised unique identifier codes provided by participants.

An intention to treat (ITT) analysis was performed on all quantitative data to reduce effectiveness bias. Specific analyses were as follows: a) Chi-squared analyses were performed to compare demographic differences between the experimental and control group at baseline b) The main analysis for ITT was a 2x2 repeated measures ANOVA which compared the control and intervention groups in terms of their baseline (T1) and post intervention (T2) scores for frequency of practise, intention, affect, overall wellbeing (WHO-5), and COM-B components of motivation, capability, opportunity (28). A significance level at $p \leq .05$, and effect sizes assessed using eta-squared η^2 with 95% confidence interval to assess difference between T1-T2 was used, with effect size range of small (0.01), medium (0.06) and very large (0.14) for repeated measures design [35]. Main effects for time (Within-Subjects), group (between subjects, PII versus PBA), and the interaction (Time x Group)

were reported. A mediational analysis was not considered appropriate given the bespoke nature of the main measurement tool and feasibility level of this study.

Chi-Squared analysis was used for data only completed at follow-up which explored participant awareness of the benefits of pranayama and implementation intention, and their ability to monitor work and non-work-based challenges, and statements reflecting cued and non-cued responses to pranayama.

2.8. Qualitative analysis

A qualitative content analysis [31] was performed on benefits awareness statements (control group) and implementation intention statements (intervention group) at T1 and T2. Content analysis was chosen as a method rather than thematic analysis due to the “non-rich statement based” nature of the qualitative data. Codes were assigned to responses from descriptive questions which focused on implementation intentions created (‘critical incident’ and ‘action’ element’), and perceived challenges and benefits of practising pranayama. There was no comparison of BAP benefit statement at T1 and T2 because participants were not asked to recall anticipated benefits yet were asked to document experienced benefits at time T1 and T2. Interpretation based on exact words of participants was used to reduce bias in allocating themes e.g., if a participant reported: ‘I feel X this’, was taken as an emotional benefit; whereas if they were describing awareness of something this was interpreted as a cognitive benefit. Participant recording of benefits were construed to be an indirect measure of fidelity to pranayama practice.

Analysis comprised the researcher: listing raw comments of ‘non-rich statement-based’ qualitative data from survey responses, reading comments, identification of patterns and generating themes within the data, and focusing on further refinement of these [36]. Themes for the following areas were constructed a) implementation intention identified critical situation b) deviation of implementation intention, c) benefits experienced and d) challenges experienced in practising pranayama.

A frequency analysis was conducted for a) critical situation identified in implementation intention b) type of deviation from original implementation intention. c) benefits T1-T2. There were no comparisons across T1 and T2, as participants were not asked to remember these during the intervention week. Triangulation of data for variables of challenge and perceived benefits was embedded in the mixed methodology embedded in the survey [37].

2.9. Ethical principles of the study

Ethical permission (application ETH2021-0172) for this study was granted by the University ethics committee. This proposal was not submitted to an NHS research ethics committee and, as a result, participants could only participate on a personal basis, and only be approached via their personal email addresses and not via NHS email addresses.

3. Response to the study and reporting of results

Demographic characteristics: There were no differences for age, ethnicity, professional group, length of time in service, times practised pranayama previously, pranayama practise during the past week for PII and PBA groups (Table 1)

A total of 155 participants showed an interest in the study. Of these 106 completed baseline measures. Nineteen people completed one or two demographic measures and were excluded from the randomisation process as they had not watched the demonstration video that was part of the condition for each group. Three people withdrew their data from the study. Eighty-four participants were included in ITT and 49 in PP analysis. ITT analysis included participants who: completed T1/T2 measures with II/benefit statements (PBA n= 26, PII n= 23), did not

Table 1
Demographic Baseline Data (Intention to Treat Analysis): n=84.

Demographic	ITT Full Sample n (%)	ITT PBA n (%)	ITT PII n (%)	χ^2 , p value
Participants	84	44	40	
Age (n=84):	-	-	-	5.312,
18–24 years old	9 (10.71)	7 (15.91)	2 (5)	p<.379
25–34 years old	25 (29.76)	13(29.54)	12 (30)	
35–44 years old	28 (33.33)	15 (34.09)	13 (32.5)	
45–54 years old	17 (20.24)	7 (15.91)	10 (25)	
55–64 years old	4 (4.76)	1 (2.27)	3 (7.5)	
65–74 years old	1 (1.19)	1 (2.27)	-	
75 years or older				
Gender: female: Male	71:13 (84:15)	36:7 (84:16)	34:6 (85:15)	.013, p<.908
Ethnicity (n=83):	56 (67.47)	31(72.09)	25 (62.5)	1.344, p<.511
White British	3 (3.61)	2 (4.65)	1 (2.5)	
Mixed or Multiple	12 (14.46)	4 (9.30)	8 (20)	
Asian or Asian British	5 (6.02)	3 (6.98)	2 (5)	
Black, African, Caribbean, or Black British	7 (8.43)	3 (6.98)	4 (10)	
Other ethnic group				
Profession (n=84):	56 (66.67)	27(61.36)	29 (72.5)	1.344, p<.511
Traditional – Mental Health	23 (7.38)	14(31.82)	9 (22.5)	
Traditional – Health Alternative Medicine	5 (5.95)	3 (6.82)	2 (5)	
Length of time in Service (n=83):	34 (41.46)	18 (42.86)	16 (40)	1.26, p<.868
1–10 years	14 (17.07)	16 (38.09)	8 (20)	
11–20 years	5 (6.10)	6 (14.28)	3 (7.5)	
21–30 years		2 (4.76)		
30 +years				
Times practised P previously (n=84):	5 (11.63)	24 (55.81)	24 (60)	2.265, p<.519
none	14 (32.56)	14 (32.56)	14 (35)	
a couple of times regularly practise		5 (11.63)	2 (5)	
How often practised P in past week (n=84):	36 (43.37)	20 (45.45)	16 (40)	4.34, p<.363
None	16 (19.28)	11 (25)	10 (25)	
Once	1 (1.20)	10 (22.73)	1 (2.5)	
A couple of times	10 (12.05)	-	7 (17.5)	
Three-four times a day				
Daily		3 (6.82)		

P= Pranayama, ITT = Intention to Treat, PBA = Control group, IIP = experimental group). **Response to Intervention**
Quantitative

document II/ benefit statement at baseline/follow-up or provided a statement not referencing the intervention (PBA n=1; PII=3), or did not complete follow-up (PBA n=17; PII=14).

Intention to treat analysis was applied to explore demographic differences between intervention and control group. Effects of time, group and group X time were analysed for differences across T1-T1, for PII (intervention group) and PBA (control group) for primary outcomes. Table 1 Tables 2–3 include main effect for time, except for WHO-5 which includes group X time findings.

4. Engagement in pranayama practise and intention to practise pranayama

There were no significant differences between intervention and control groups in terms of either engagement in or intention to practise pranayama (Table 2).

ITT analysis: There was a significant main effect for time which showed increased pranayama engagement, with increased practise between T1-T2, with a large effect size (partial eta-squared =.89). There was no main effect between the groups and no interaction effects. For intention to practise, there was no main effect of time, or interaction (group X time) (Table 2).

Table 2
Intention to practise, pranayama practise, and emotional wellbeing (ITT analysis, n=84).

Measure	PBA		PII		Within-Subjects F, p value, n ²
	T1 mean (SD)	T2 mean (SD)	T1 mean (SD)	T2 Mean (SD)	
How often practised P over the last week?	.977 (1.15)	7.43 (2.43)	1.42 (1.48)	7.7 (2.17)	699.82, <.001,.895
Intention to practise P over the next week	5.64 (3.38)	6.61 (3.04)	6.52 (3.07)	6.5 (3.07)	1.888, <.173,.023
Perceived energy from P practise.	6.09 (2.39)	6.27 (2.47)	6.85 (2.11)	7.00 (1.95)	.1.011, <.318,.012
Perceived pleasantness of P practise	6.57 (2.50)	6.98 (2.46)	7.42 (2.23)	7.80 (1.95)	4.838, <.031,.056
Happiness	5.66 (2.57)	5.63 (2.41)	5.39 (2.32)	6.07 (2.09)	2.763, <.100,.033
Calm	7.39 (2.40)	7.00 (2.61)	7.72 (2.18)	7.61 (2.01)	.451, <.504,.005
Alert & Focused	6.41 (2.55)	6.74 (2.35)	6.28 (2.60)	6.75 (2.16)	4.954, <.029,.057
Fear	1.10 (1.50)	1.32 (1.76)	1.09 (1.36)	1.12 (1.60)	.964, <.329,.012
Sadness	1.38 (1.78)	1.21 (1.83)	1.19 (1.61)	1.24 (1.80)	.131, <.719,.002
Numb	.61 (1.03)	.99 (1.71)	.84 (1.34)	.92 (1.59)	3.235, <.076,.038

P= Pranayama, PBA = Control group, IIP = experimental group

5. Emotional regulation and overall wellbeing

ITT analysis: A main effect for time between baseline and one week was seen for subjective pleasantness and alert/focused ratings (Table 2); medium effect sizes were observed; partial eta-squared =.056,.057, respectively. There was no significant main effect for groups or interaction for emotional regulation variables. The total score for WHO-5, the overall wellbeing Index, showed no statistically significant main effects of group or time or any interaction (Table 2).

6. Perceived capability, opportunity, and motivation

Motivation. An interaction effect for subjective feelings of being drawn to practise pranayama (motivation-autonomic) with the PBA group showing reduced feelings of being drawn to practice in comparison to the PII group in group who showed an increase over time (Table 3); a medium effect was found (partial eta-squared =.059). There was no main effect of time or between-subjects for being drawn to practise pranayama, and no main effect for time, group, or interaction for other motivational variables.

Opportunity. A statistically significant main effect of time was shown for time for perception of having enough time in the day to practise pranayama (opportunity-physical) with an increase at follow-up reported. A medium effect size for this was demonstrated (partial eta-squared =.79). No statistically significant main effects of time or group interaction was found for opportunity-social or capability-physical dimensions. (Table 3).

Capability. A statistically significant main effect for time was shown for 3 capability variables; confidence in practising pranayama, remembering to practise pranayama, and receiving adequate guidance (capability-psychological). Medium effect sizes were shown for remembering to practise pranayama (.061) and receiving adequate guidance (.089) and confidence rating (.101). There was no main effect of group, or interaction for increased confidence for practising pranayama, remembering to practise pranayama, or receiving adequate guidance on pranayama (Table 3).

Table 3

Overall wellbeing, perceived motivation, capability, and opportunity for pranayama practise (ITT analysis, n=84).

Measure	PBA		PII		Within-Subjects Time x Group* F, p value, n ²
	T1 mean (SD) (4.10)	T2 mean (SD) (4.66)	T1 mean (SD) (4.92)	T2 mean (SD) (6.27)	
*WHO-5 (Whole score)	14.93 (4.10)	15.20 (4.66)	14.52 (4.92)	14.45 (6.27)	0.37, <.849,.000 1.267, <.113,.737
Motivation					
Strive to engage in P	3.39 (1.16)	3.41 (1.37)	3.79 (1.20)	3.82 (1.01)	.021, <.885,.000
Enjoy practising P	3.93 (.950)	4.09 (.891)	4.28 (.815)	4.22 (.89)	.136, <.713,.002
Drawn to practice P due to how makes feel	3.41 (1.06)	2.73 (1.33)	4.02 (.87)	4.07 (.87)	3.752, <.056,.044
Believe in the benefits of P practise	4.20 (.03)	4.34 (.94)	4.62 (.53)	4.57 (.53)	.120, <.730,.001
Encouraged to practise P by colleagues	2.66 (1.34)	2.59 (1.40)	2.99 (1.48)	2.90 (1.5)	.122, <.727,.001
Prioritise work demands over P practise	3.86 (1.27)	3.07 (1.07)	3.77 (1.07)	3.50 (1.34)	1.190, <.278,.014
Prioritise family over P practise	3.70 (1.38)	3.50 (1.27)	3.60 (1.35)	3.81 (1.13)	.001, <.977,.000
Prioritise other things over P practise	3.73 (1.28)	3.61 (1.20)	3.77 (1.14)	3.8 (1.11)	.114, <.737,.001
Opportunity (Social)					
Feel encouraged to practise P by family/friends	2.54 (1.39)	2.54 (1.40)	2.61 (1.37)	2.72 (1.34)	.615, <.685,.002
No work commitment barriers to practising P	3.34 (1.44)	3.32 (1.34)	3.33 (1.40)	3.21 (1.45)	0.19, <.892,.000
No work commitment barriers to me practising P	3.34 (1.44)	3.32 (1.34)	3.33 (1.40)	3.21 (1.45)	0.19, <.892,.000
Opportunity Physical					
Have enough time in my day to practise P	7.44 (1.76)	3.81 (1.08)	7.17 (1.88)	3.74 (1.17)	325.03, <.001, 799.
Can find a space to practice when challenges came up	3.75 (1.43)	3.98 (1.08)	3.87 (.965)	3.97 (1.10)	1.576, <.213,.019.
Capability Physical					
Felt physically well enough to practise P	4.57 (.661)	4.70 (.510)	4.61 (.664)	4.44 (.71)	.573, <.451,.007
Physically easier to practise P	4.29 (.823)	4.50 (.762)	4.33 (.762)	4.30 (1.11)	.797, <.375,.003
Capability Psychological					
Confidence in Practising P	3.23 (3.41)	3.41 (1.127)	3.43 (1.33)	3.76 (1.19)	9.192, <.003,.101.
Remembering to Practise P	3.64 (1.26)	3.61 (1.66)	3.38 (1.29)	3.80 (1.20)	5.303, <.024,.061.
Received adequate guidance	3.16 (1.36)	3.66 (1.26)	23.08 (1.29)	3.77 (1.27)	8.044, <.006,.089.

*TimeXGroup analysis, P= Pranayama, PBA = Control group, IIP = experimental group

Qualitative with reference to quantitative

Cued and Non-cued response to pranayama practise

There was no statistically significant difference in post intervention awareness of benefits or implementation intention for pranayama practise present in the mind for PBA or PII group ($\chi^2 = 6.291, p < .391$;

Table 4

Thematic analysis of area of Impact, and link to COM-B framework: strength and limitations.

Quantitative results, thematic analysis* and open-feedback PBA	Thematic analysis linked with open feedback PII	Area of Impact
<ul style="list-style-type: none"> PII and PBA reported increased confidence to practice pranayama, able to remember to practice techniques, perceived adequate guidance for practise, and ability to add to daily practice (Table 2 & 3) Limited deviation of implementation Intention between T1-T2*: 	<p>e.g., Implementation Intention deviation (feedback examples) Approximate match: <i>'If I feel any degree of anxiety or disquiet, then I will sit quietly for 5 minutes and practice Pranayama until I feel centred again'</i> SHIFTED TO <i>'If I'm feeling anxious then I'll sit quietly for 5 minutes and do pranayama'</i></p> <p>More specific to less specific: <i>If I am feeling self-critical or not enough. Then I will practice breathing and letting go of self-critical thoughts... for 2 minutes, either sitting down or walking when possible'</i> SHIFTED TO <i>'If I'm feeling self-critical then I will practice 2 minutes Ujjayi breathing either sitting or walking'</i></p> <p>Change in Focus: <i>'If I feel irritated or frustrated with colleagues or clients at work, I will take a few minutes at the end of the meeting to do some pranayama SHIFTED TO 'If I am feeling stressed at work, I will practice some pranayama'</i></p> <p>Open-Feedback examples PII <i>'I only did it twice. I was too stressed to remember that I had committed to do it'... (n= 4) 'I forgot at first and then I noticed how dysregulated I was feeling and did use it once or twice'</i></p>	<p>Capability Strength Limitation</p>
<ol style="list-style-type: none"> Approximate match: adding to the critical situation or adjusting description of the critical situation (n=15) More specific to less specific (n=6). Complete match in II (n=4) Change in identified emotion associated with critical situation=3 Less specific to more specific i.e., about type of breathing, how practise (n=2) Change in II focus (n=1) 	<ol style="list-style-type: none"> Remembering to do, forgetting to use implementation intention, limited time at work and perceived work-stress, influence of habit/ ease of reversing back to previous coping methods and perceived work-stress <p>Open-Feedback examples PBA <i>'I haven't actually used it... it wasn't something that I could bring to mind when things got hard' (n=2) 'I forgot my intention...would have liked more reminders' (n=2) '</i></p>	<p>Opportunity Strength</p>
<ul style="list-style-type: none"> PII and PBA reported increased opportunity and time to practice pranayama after one week (Table 3) <p>PBA: open-feedback <i>"I did it in the baths in the morning when I knew I might have a stressful day". "Very helpful, enabled me to approach situations with a clearer mind and be more mindful in my responses"</i></p> <p>Ability to form a personalised critical situation - II themed examples with cued prompt type:*</p> <ol style="list-style-type: none"> Internal Emotional (n=16) External (n= 7) Behavioural (n=4) Internal Somatic (n= 2 Internal Cognitive (n= 2) 	<p>Open-feedback suggesting positive use of pranayama: PII: open-feedback <i>'The practice gave me some relieve and energy to continue with my work. I feel much better and refresh'. "It's not easy to change habits ... e.g., instead of looking through phone when taking a couple of minutes away from working; but it is possible and I managed to do it a few times, each time it was beneficial":</i> Open-feedback (dominant and least dominant theme): Internal Emotional</p> <ol style="list-style-type: none"> <i>"If I feel overwhelmed with too many tasks to do and not enough time in the day, then I'll find somewhere quiet to sit and practise pranayama for two minutes minimum"</i> <p>Internal Somatic and Cognitive <i>If I feel any degree of anxiety or disquiet, then I will sit quietly for 5 minutes and practice</i></p>	<p>Opportunity Strength</p>

(continued on next page)

Table 4 (continued)

Quantitative results, thematic analysis* and open-feedback PBA	Thematic analysis linked with open feedback PII	Area of Impact
<ul style="list-style-type: none"> Engagement: PII and PBA reported increased pranayama practise and intention to practise over a week. (Table 2) Benefits Identified pre-intervention (T1)* PII and PBA 	<p><i>Pranayama until I feel centred again.</i> <i>If I need some time alone, then I will go to the toilet and have a minute to myself"</i></p> <p>Open-feedback (dominant and least dominant theme): Emotional <i>Feeling calmer and more settled'</i> Somatic and emotional <i>'Calms my body and mind, especially humming bee - Moves all down my body...'</i> Somatic and Cognitive <i>'Sense of calm, clarity, and ability to let go'</i></p>	<p>Motivation Strength Limitation</p>
<ol style="list-style-type: none"> Somatic + Emotional (n= 13) Emotional (n= 13) Cognitive + Emotional (n= 7) Somatic (n= 4) Somatic + Emotional + Cognitive (n= 2) Somatic + cognitive (n=1) <p>Limited lack of impact on overall wellbeing Table 2 BA experienced new benefits of pranayama in and outside of work compared to PII (Table 4)</p>		

Table 4). There was no significant effect for differences in monitoring work-based challenges for PBA and PII groups. ($\chi^2 = 6.861, 332, p < .381$). New benefits popped up more in the mind for PBA group ($M = 1.87$ SD = .344) compared PII ($M = 1.42, SD. 50$) for work-based challenges, and for non-work-based challenges (BAP: $M = 1.69, SD = .47$; IIP: $M = 1.08, SD. 27$)

7. Discussion

In view of response to interventions, it is helpful to refer to the theoretical framework of acceptability (TRA) [30] in an analysis of the acceptability of this study’s interventions. Four constructs of this seven-construct framework appear pertinent to qualitative and quantitative findings. More specifically, these findings direct us to the extent to which health professionals understand the interventions (Intervention coherence), confidence and capability in ability to perform pranayama (self-efficacy), how much interventions influence pranayama practice and intention to practice (perceived effectiveness), and how an individual feels about the afforded interventions (affective attitude). As authors we suggest that acceptability is part of feasibility, and therefore recruitment and retention feasibility outcomes, are an indication of acceptability.

7.1. Recruitment, retention, intervention coherence, and delivery context

A snowballing and social media approach provided interest in the study, with 54.7% (PII) and 52.3% (PBA) of participants participating at baseline, continuing through to follow-up. An ITT analysis included all participants from randomisation to follow-up (PII: 40 PBA; 44 – See Fig. 1). A per protocol analysis was based on 27.4% and 31% response rates, falling below acceptability for analysis. Although participants were automatically sent the survey after one week, a large degree of attrition was due to people not reporting descriptive data at follow-up, highlighting the fallibility of online research for comprehensive completion of surveys, possibly due to question fatigue, or lack of face-to-face human interaction encouraging completion [38]

In view of intervention coherence, healthcare professionals clearly

understood the concept of implementation intention (II) as their compliance with the standard format of these was high. Only one participant changed their implementation intention, whilst others showed a slight or approximate match, or change of direction in specificity, with some IIs becoming less specific over time and some more specific. (Table 4) This is significant given that the change mechanism of implementation intention relies on the fact that people remember their II [10] yet unalarming given findings of no impact from less specific compared to more specific afforded IIs [9]. This study’s findings suggest that having a concrete II, as opposed to an evolving one, does not work by memorizing statements verbatim. This notion fits with the subconscious nature of the remembering process according to dual process theory [39]. This might be a reason for reminding people of their II statement via text or other applications in the future.

The finding that the control group experienced more new benefits of pranayama in and outside of work compared to the intervention groups awareness of new II in these settings, suggests the PBA condition allowed participants to experience new benefits to pranayama compared to those anticipated at the beginning of the study. This suggests that the hypothesised self-generating quality of IIs [40] is possibly constrained in certain conditions. The less constrained nature of the control statement may have allowed for more generalisation of the effects of pranayama, helping to counteract perceived challenges. Hence, it may be important for interventions incorporating implementation intentions to be practised in less stressful environments initially.

7.2. Impact on practise, intention, emotional regulation, and overall wellbeing

Perceived effectiveness, understood by the impact of two motivational messages, overall showed disappointing results for statistical outcomes of engagement and intention to practise pranayama, emotional regulation general wellbeing and general wellbeing, with overall findings limited to significant effect for time, with minimal significance for group interaction with time. The idea that the PII intervention would have a stronger effect on practise and intention to practise was rejected, as intention to treat analysis showed both motivational interventions showed increased practice of pranayama overtime (Table 2). This suggests being aware of the benefits of pranayama and creating an II has the potential to increase practice by an equal amount and that one condition is not superior to another. Possible reasons for the lack of impact are a) benefits awareness offered an equal alternative for engagement in pranayama amongst healthcare professionals, b) the surreptitious and approximately fourteen-minute intervention demonstration, did not provide a strong enough dose to show a difference and c) that this was a self-selecting sample, and it might be argued than those that participated were already motivated to engage in practise, thereby creating a ceiling effect for increased practise and intention.

An implicit indication of affective attitude is seen in the commonly cited emotion ‘overwhelmed’ in created IIs, which links to identified concern about care provision and lack of support at work for healthcare professionals [41]. Although thematic analysis of open feedback found the most popular benefits identified by healthcare professionals were emotional, or a combination of emotional and somatic (Table 4), psychometric measures found impact on affect was limited to increased perceived pleasantness, alertness/focus, and happiness one-week after intervention. It is possible that use of a validated scale such as the PANAS negative and positive effect subscale [42], may have been more sensitive to change than the VAS scales used. It might be possible that these positive emotions reinforce practice and are mediators of increased practise and intention to practise. Although calmness was frequently reported by participants in open feedback, this was not statistically significant over time in this study, and may have taken longer to change, along with other affect dimensions, as found in other diaphragmatic breathing-based research [43].

The WHO-5 scale [28] indicated no significant shift in overall

wellbeing over time in either group. Lack of impact in this domain may be due to the dosage of pranayama afforded or that improved positive affect was limited in a Covid-19 context where there has been a decline in healthcare worker positive affect [44]. A generic measure of the COM-B model of behaviour change [45], published after the start of this investigation, may be more sensitive for exploring capability, opportunity, and motivation [29] changes in future research.

7.3. Perceived motivation, capability and opportunity for pranayama practise

Healthcare professionals' self-efficacy for engagement in interventions, can be linked to open feedback and emerging COM-B factors [24] influencing behavioural engagement in pranayama. Healthcare professionals experienced capability, opportunity, and motivation for engagement in pranayama practice although not without challenges. Although, many healthcare workers incorporated pranayama into their daily routine easily, remembering to use it and finding time/space to use as an 'instant release from stress', others were compromised by work-based challenge/stress, or internal challenges such as habit behaviours, forgetting and remembering to engage in the practise, and or a preference for guided practise. (Table 3). It is interesting that one professional reported that dysregulation in their body activated pranayama practice, and that the critical situation in majority of IIs created was underpinned by an emotional-based critical situation (Table 4). It might be that the environmental stress as an identified challenge, limited the workability of II and worked against the subtle subconscious process, identified in dual process theory by which II works [46]; pushing some healthcare workers outside of their workable range of stress, to a perceived threat state [47] where pranayama practice became blocked.

A statistical shift in psychological capability was not expected (Table 3), as participants had all had previous pranayama practice, yet professionals reported feeling more confidence in practicing pranayama, able to remember to practice techniques, and a sense of adequate guidance for this practise. This suggests that a small dose of pranayama might influence confidence to practice, and that increased confidence to practice may be a mechanism of the effect of time on practice. However, confidence may not be a mediating effect but a practise effect. Increased perception of time to practice pranayama over the intervention week, increased practise previously mentioned, yet no change in ability to find a space to practise when challenges came up, suggests that participants were willing to practise and found an opportunity for this, yet did not necessarily find their environment accommodating to that practise.

Overall, this study indicates the promise of engaging a CAM practitioner to increase intention to practice and actual practice of pranayama. The study showed feasibility with many people with some experience of pranayama interested and many providing some data. However, using IIs did not additionally increase either intentions or practice; this may be due to the work [48] context where the delivery of CAMs practices may not be encouraged. Findings highlighting the utility of the intervention in this study to influence specific COM-B framework [24] i.e., increasing health professionals' capability and motivation to practise over a week period, despite this opportunity being perceived as compromised due to intrapersonal and external reasons. It would be interesting to explore further effects of more direct guidance/coaching, reminders or cues to practice in contexts where protected time is not afforded for wellbeing practice. Subjective benefits in this one-week intervention were mainly emotional, or a combination of somatic and emotional; longer interventions may yield additional benefits.

This study provides a platform for a randomised controlled trial focused on the utility of applying behaviour change techniques to pranayama practice to improve its practice and efficacy. Further enquiry into the possible mediating impact of confidence and guidance would be informative.

Declaration of Competing Interest

All authors declare that they have no conflicts of interest.

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