

Does triggering an Autonomous Sensory Meridian Response reduce pre-operative anxiety?

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Introduction

The incidence of pre-operative anxiety in Western populations is 60-80%¹. It is described as an unpleasant state of uneasiness or tension secondary to subjective concerns about the success of their surgery, the fear of anaesthesia and post-operative pain².

Pre-operative anxiety provokes a sympathetic response in patients resulting in increased heart rate, elevated blood pressure and increased cardiac contractility leading to possible cardiac arrhythmias and has been linked to increased post-operative pain, increased need for analgesics and prolonged hospital stay^{3,4}.

Recent studies indicate potential anxiety reducing roles for non-pharmacological interventions such as music therapy or educational multimedia⁵. Autonomous Sensory Meridian Response (ASMR) is an alternative relaxation technique that has recently gained significant social media popularity and yet few scientific studies have been conducted into its calming effects⁶.

ASMR incorporates visual and acoustic stimuli to evoke low-grade euphoria and a tingling sensation on the skin, commonly starting from the scalp and radiating down the limbs⁶. Examples of the stimuli that trigger ASMR include listening to softly spoken words or whispering, watching someone tap lightly on objects, and receiving personal attention⁷. Convenience sampling of participants in online surveys have revealed potential roles of ASMR in reducing chronic pain, anxiety and depression, but rigorous studies are pending to date⁸.

Our primary objective is to determine if an intervention designed to trigger ASMR produces a measurable difference in pre-operative anxiety. Secondary outcomes were physiological changes using serial measurements of vital signs.

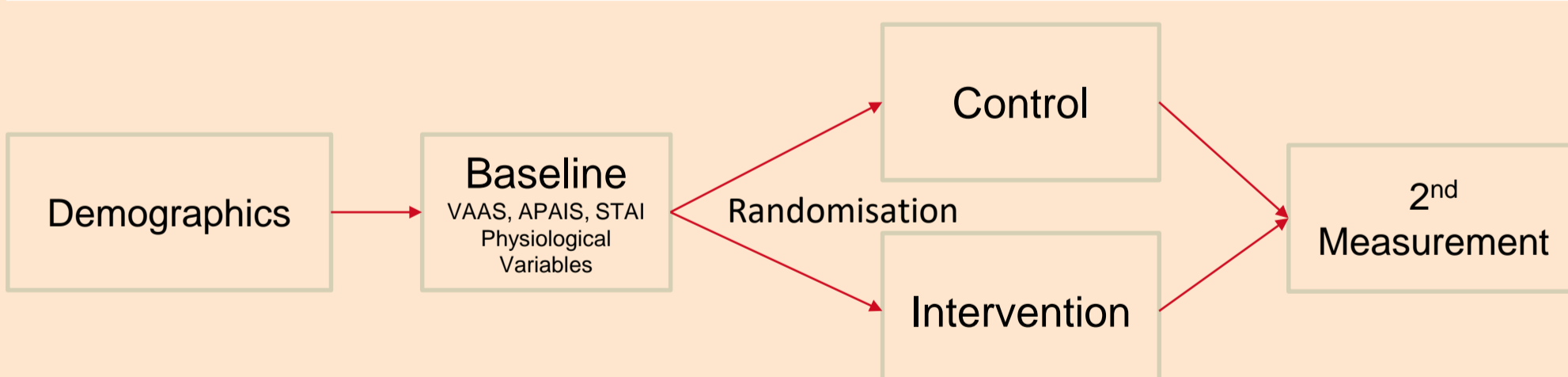
Methods

This prospective, randomized, triple blinded, placebo controlled trial received HREC approval (011-2017) and is registered with ANZCTR (12617001193814).

A convenience sample of consecutive pre-operative participants were selected from the day-surgery unit at Sydney Adventist Hospital, between the hours of 11am – 5pm. We included patients at or over the age of 18, without significant visual and/or hearing impairment and with an adequate comprehension of the English language. Participants were approached by one of two investigators (KC or DN) who presented a pre-rehearsed script for patient interaction to standardise our approach. Written and informed consent was then obtained prior to their inclusion in this study.

The primary outcome measure was a change in preoperative anxiety measured by the Visual Analogue Anxiety Scale (VAAS), the Amsterdam Preoperative Anxiety and Information Scale (APAIS), and the State-Trait Anxiety Inventory State (STAI-S) after watching the video.

Figure 1: Schematic of study design



The APAIS is a self-administered questionnaire consisting of 6 statements describing pre-operative anxiety which are rated 1 to 5⁹.

Figure 2: iPad view of the APAIS in the Questionnaire

The VAAS is a visual line on which patients can rate their anxiety on a continuum¹⁰.

Figure 3: iPad view of the VAAS in the Questionnaire

STAI is a self-administered questionnaire consisting of 40 items that measure state (i.e. current) anxiety (S-STAI) and trait (i.e. long standing) anxiety (T-STAI)¹¹. For both S-STAI and T-STAI, scores range from 20-80 with >44 being indicative of clinically significant pre-operative anxiety. All questionnaires have been validated in the pre-operative setting⁹.

Figure 4: iPad view of the STAI Questionnaire

The intervention video (6 minutes 36 secs) is aimed to elicit ASMR. It featured an investigator communicating information about what to expect in the perioperative period. It was delivered with slow whispering, slow hand movements and repetition of certain words and syllables. The presenter lightly tapped on these objects, and made crisp sounds by crinkling the blanket as an ASMR trigger⁶. Personal attention was achieved by asking questions to the camera, for example, 'how are you feeling today'?

The control video (2 minutes and 49 sec) contained the same information and was delivered in a conversational tone.

The questionnaires and video were incorporated in a single electronic file using REDCap (Research Electronic Data Capture) tool, accessible on an iPad for patient use.

A sample of 50 participants were required to achieve 90% power at 5% significance level to detect a strict 0.5 SD reduction in at least one of STAI-S, APAIS, or VAS with Bonferroni adjustment.

Results

The demographic characteristics of the groups were similar (Table 1).

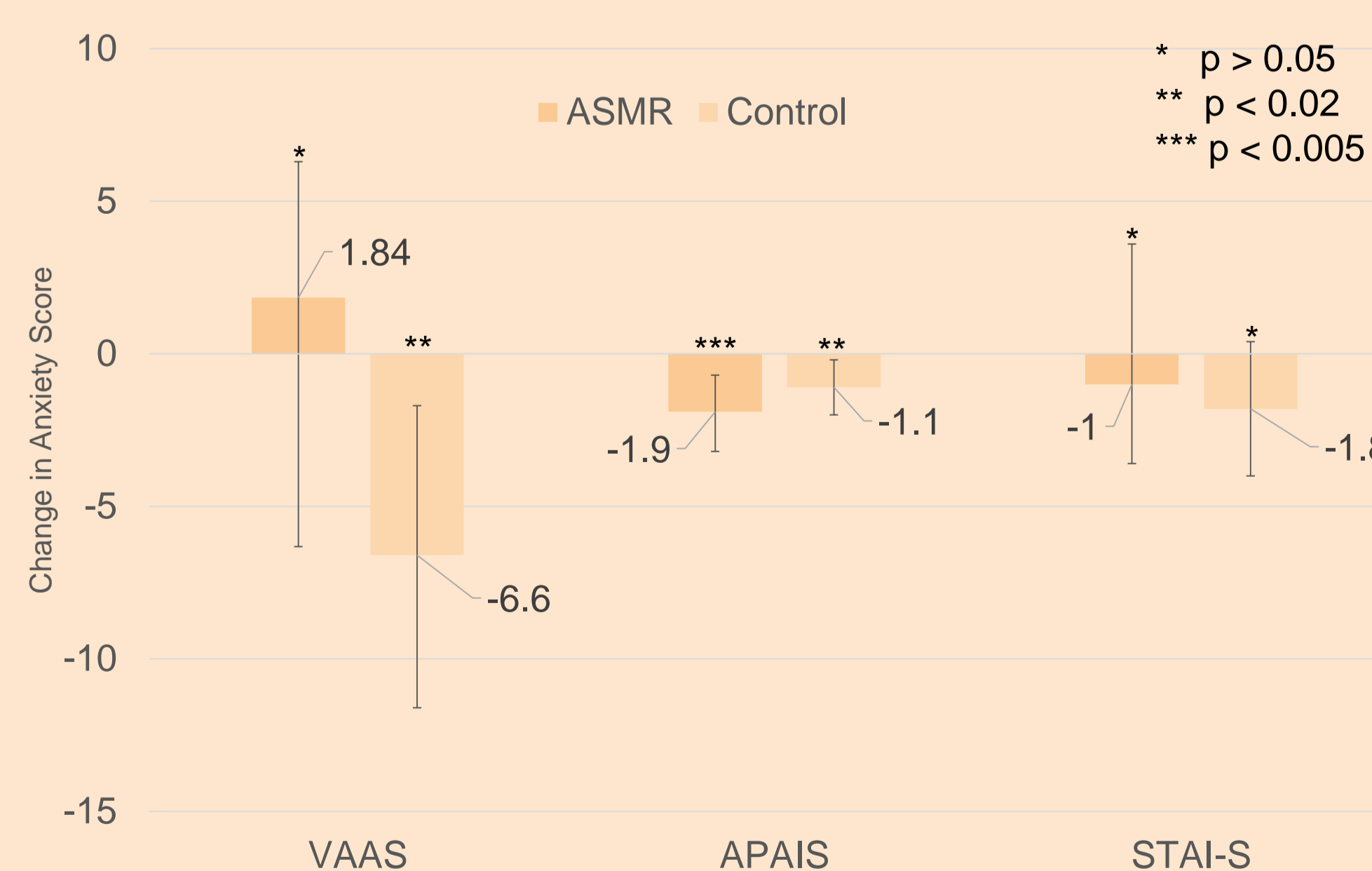
Table 1: Demographic characteristics

	ASMR n = 25	Control n = 25	p-value
Age, years (mean +/-SD)	49 (17)	45 (16)	0.33 ^c
Female (%)	56	52	1.00 ^a
Prior surgery (%)	8	8	1.00 ^a
Surgery type (%)			0.16 ^a
ENT	24	16	
Orthopaedic	12	40	
Urology	36	24	
Other	28	20	
Ethnicity (%)			0.11 ^b
Asian	0	16	
Caucasian	100	84	
Time of surgery (%)			1.00 ^a
11:00-13:59	36	40	
14:00-17:00	64	60	

a - Pearson's chi square test, b - Fisher's exact test, c - Two sample t-test

Preoperative anxiety was significantly reduced after exposure to the control video when measured by the VAAS and the APAIS. Anxiety was also reduced in the ASMR group when measured by the APAIS score, but not by the VAAS score. No significant change in anxiety was detected by the S-STAI score in either group (Figure 5).

Figure 5: Change in anxiety pre- vs. post-intervention measured by VAAS, APAIS, and S-STAI



Systolic BP decreased by 2.7mmHg after viewing the ASMR video (Table 2).

Table 2: Change in physiological variables after intervention [mean (95% confidence interval)]

	ASMR n = 25	Control n = 25	p-value
HR (bpm)	-0.6 (-3.6, 2.4)	0.1 (-1.7, 1.9)	0.54
Systolic BP (mmHg) [*]	-2.7 (-5.2, -0.2)	1.0 (-1.5, 3.6)	0.85
Diastolic BP (mmHg)	-0.9 (-2.9, 1.1)	-1.2 (-4.8, 2.4)	0.10
RR (bpm)	-0.3 (-1.3, 0.6)	0.0 (-1.1, 1.2)	0.23
SpO2 (%)	-0.1 (-0.8, 0.5)	0.2 (-0.1, 0.6)	0.34
Temperature (°C)	0.06 (-0.03, 0.14)	0.06 (-0.05, 0.18)	0.36

HR: heart rate; BP: blood pressure; RR: respiratory rate; SpO2: saturation of oxygen.
Data are median (IQR) with Wilcoxon rank sum test unless otherwise stated
^{*} Mean (SD) and t-test given distribution consistent with normality

When the potential effect of other variables on systolic blood pressure was removed by multivariable analysis, the ASMR group had a significant decrease of 3.9mmHg in post-intervention systolic blood pressure compared to control. However, this is unlikely to be of clinical significance, given that all patients had a baseline systolic blood pressure within normal range. It is significant that with every 10mmHg increase in pre-intervention systolic blood pressure, there was an increase in post-intervention systolic blood pressure by 8.8mmHg.

Table 3: Effect of watching the ASMR video, pre-intervention anxiety, trait anxiety, age, sex, type of surgery, and time of surgery on systolic BP

	Post-intervention systolic BP (mmHg)	p
ASMR (vs control)	-3.9 (-7.7, -0.1)	0.043
Pre-intervention systolic BP (per every 10 mmHg)	8.8 (7.2, 10.4)	<0.0005
STAI-T (per every 10 points)	0.5 (-1.6, 2.5)	0.65
Age (per 10 years)	-0.6 (-1.9, 0.7)	0.36
Male	0.4 (-4.2, 5.0)	0.85
Surgery Type		0.75
ENT	1.0 (referent)	
Ortho	-0.2 (-6.0, 5.7)	0.95
Uro	3.6 (-3.0, 10.2)	0.28
Other	0.71 (-5.6, 7.0)	0.82
Time of surgery (%)		0.42
11:00-13:59	1.0 (referent)	
14:00 - 17:00	-1.8 (-6.1, 2.6)	

Conclusion

Our results are conflicting and we cannot confirm an anxiolytic effect of ASMR. In fact in one of our outcome measures anxiety was increased by the ASMR video. It is possible, the non-clinical presentation made patients more anxious. We found a small fall in systolic arterial pressure after the ASMR triggering video, but this is unlikely to be clinically significant. VAAS and APAIS fell in the control group. We did not confirm an anxiety reducing effect of our ASMR triggering video.

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