

EFFECTS OF HOLY QURAN LISTENING ON PHYSIOLOGICAL STRESS RESPONSE AMONG MUSLIM PATIENTS IN INTENSIVE CARE UNIT

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ABSTRACT

Aim: The aim of this study is to examine the effects of listening to Holy Quran recitation on the physiological stress response of ICU Muslim patients.

Background: Most of ICU patients need to be mechanically ventilated due to respiratory distress. There were reported to experience stress. Muslim patients and their relatives' belief and literature reviewed provide evidences that the practices of prayer recitation among Muslims that were critically ill were not empirically researched in Malaysia.

Methods: Repeated measures quasi experimental design was conducted. Forty-four Muslim subjects whom mechanically ventilated were alternately assigned to the intervention and control group. Physiological parameters; heart rate (HR), systolic (sBP), diastolic blood pressure (dBP), mean arterial pressure (MAP), respiratory rate (RR), were measured to examine the outcome.

Results: Pretest–posttest score mean differences comparison showed no significant differences in HR, sBP, dBP, MAP, and RR when all p-values > 0.05. Over time, the intervention group experienced significantly no reduction in physiological stress response except in HR.

Conclusion: The study revealed that Al Quran recitation not significantly effects the physiological stress except for the HR. Holy Quran effect as non-invasive intervention need to be intensively examined as it is believe to promote psycho-spiritual comfort for Muslim mechanically ventilated patients as it reduced the patients' HR.

Keywords: *Effects, Holy Quran recitation , stress response, mechanically ventilated.*

INTRODUCTION penile tumescence

As reported by many writers years ago, mechanically ventilated patients were experienced stress (Bergbom-Engberg & Haljamae 1989, Russell 1999). Recent studies has reported that 85% of the ICU patients having stress (McKinley et al. 2004) Based on researcher experiences, patients with stress were demonstrated physiological and psychological deterioration which impede their recovery. Therefore many interventions were designated pharmacologically and non-pharmacologically. Listening to prayer recitation was selected as a non-pharmacological intervention for Muslim mechanically ventilated patients to reduce their stress. This is a commonly practice intervention among Muslims but no empirical study have been conducted to examine the effect of prayer recitation on stress among Muslim mechanically ventilated patients.

Background

Hweidi (2007) has identified many stressors experienced by mechanically ventilated patients and the most are pain and discomfort due to invasive procedures. The fear of uncertainty, medical

procedures and ICU environment are also stressors to ICU patients (Löf, Berggren, & Ahlström, 2006). Pharmacological agents were reported to delay mechanical ventilation weaning process (). Therefore, non-pharmacological strategies to manage mechanically ventilated patients' stress are recommended by Kress & Hall, 2006, Tracy and Chlan (2011).

LITERATURE REVIEW

There were studies to evaluate the effects of music therapy on stress among mechanical ventilated patients (Updike, 1990; Chlan, 1998; Chlan, 2000; Wong, Lopez-Nahas & Molassiotis, 2001; Lai & Feng, 2004; Lee, Chung, Chan & Chan, 2005; Han, Li, Sit, Chung Jiao & Ma, 2010) and found it reduced stress-induced physiological responses such as changes in respiratory frequency, heart rate, and blood pressure.

Beside music therapy, spiritual care also has been recommended as it can effect on the patient's comfort and attain inner harmony (Narayanasamy, 1999). Non Muslim prayer recitation empirical studies found positive physiological changes among critically ill patients (Anastasi & Newberg, 2008).

Muslim believes every word in Al-Quran (Hweidi, 2007). The Prophet Muhammad peace be upon him (pbuh), for example, himself used and advised his followers to D'ua (prayer) in times of stress. Rasulullah SAW was agreed that Surah Al Fatiha as Ruqya as it is a dua to Allah for cure against disease (Hadith Al Bukhari). Whereas, Surah Yassin, the 36th chapter in Holy Quran is also believes by Islam followers as one way of recovering or peaceful during sickness. These two surahs are commonly used by Muslim when they are sick or dying (Deureseh & Tohar, 2007).

Since Muslim believe and practice on reciting al-Quran as a way to alleviate stress and recover from sickness therefore this study was conducted to examine effects of Al-Fateha and Yassin recitation on physiological stress response among mechanically ventilated patients as this empirical study haven't done on this population yet.

METHODOLOGY

This ethically approved quasi-experimental study have been conducted in Intensive Care Unit of University Malaya Medical Center on 44 participants with the aim to examine the effects of Al Fatehah and Yassin recitation on physiological stress response among Muslim mechanically ventilated patients whom were selected by purposive sampling method in ethical manner.

DATA COLLECTION

Demographic data were collected and participants were alternately assigned to a single 30-minute session of either intervention group or Control group. The study was conducted after all ward routine activities has been completed to ensure resting environment. In promoting rest, patients' room door was closed, the lights were dimmed and all staff were informed regarding the study being conducted. Each participant was instructed to lie quietly with eyes closed, rest and think of something pleasant (Chlan 1998). The researcher remained in the room without noticed by participants to record the physiological responses throughout the procedure.

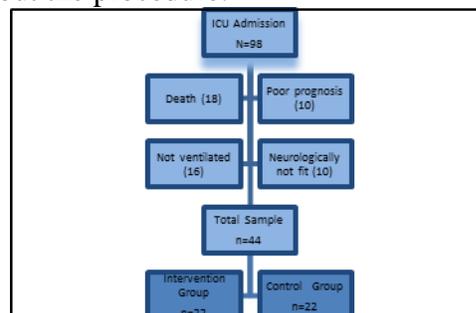


Figure 1 : Response Rate

Intervention Group

The intervention group had a single 30-minute session of listening to Surah Al Fatehah and Surah Yassin recitation which was recited by an Ustaz with correct tajwid, pronunciation and taranum and listened through headphones from MP3 recorder. The volume of the MP3 player will be adjusted to the participants' satisfaction by their facial expression. The measurements of physiological parameters, namely; heart rate (HR), systolic blood pressure (SBP), diastolic blood pressure (DBP), mean artery pressure (MAP), respiratory rate (RR) and saturation of partial oxygen (SPO2) of patients were recorded as baseline before the intervention started, and followed by 5 minutes interval during the 30 minutes intervention and 5 minutes after the intervention completed.

Control Group

The same procedure of physiological stress response parameters as intervention group were measured from the control group whom were instructed to close their eyes for 30 minutes with neither head phone nor prayer recitation.

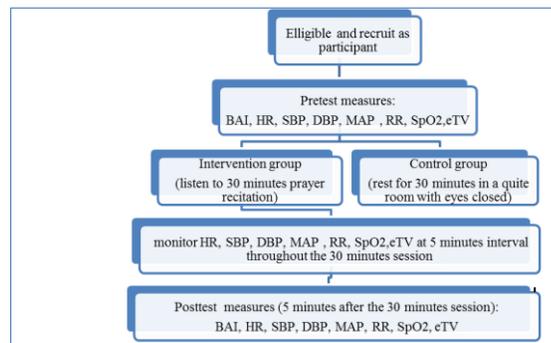


Figure 2 : Study Flow

DATA ANALYSIS

Both parametric and nonparametric statistical test were used to analyze the collected data as indicated by the normality test. Demographic and clinical characteristic of participants were homogenized statistically with Chi-square and Man-Whitney U test and were summarized descriptively. The baseline physiological parameters mean differences among both groups were tested with independent T tests and Mann-Whitney U test to determine the homogeneity.

The effects of prayer recitation were examine by testing the pretest-posttest mean differences of both groups' physiological parameters with paired T test and Wilcoxon Signed Test. The changes of nine observations overtime of physiological parameters were detected with Repeated Measures ANOVA (RM ANOVA). The level of significance was set at $p < 0.05$. SPSS-PC software (Version 16.0 For Windows) was used for all data analyses.

RESULTS

Demographic and clinical characteristic

There were 44 out of Muslim mechanically ventilated patients participation. The age ranged between 19 to 73 years old with age means of 48.93. As presented in Table 1, of the 44 participants 26 (59.10%) were male and 18 (40.90%) were female. Majority were suffered medical diseases.

86.4% of participants has no experience being mechanically ventilated before. Oral endotracheal tube (ETT) was the most common (63.6%) types of airway used for participants to connect them to ventilator. The most common ventilation mode used is Continuous Positive Airway

Pressure (CPAP) and Synchronize Intermittent Mechanical Ventilation (SIMV). The mean positive end expiratory pressure and oxygen friction were 7.75 and 0.38 respectively.

The demographic and clinical characteristics were homogenous as they were no significance differences when all p-values were greater than 0.05 (Table 1).

Effects of prayer recitation on physiological stress response and anxiety

Baseline physiological parameters for both groups were presented in Table 2 and Table 3. The independent T tests found no significant mean difference in HR, SBP, DBP, MAP and SPO2 which indicate that they were homogenous.

Table 1 : Comparison of demographic and clinical characteristics among groups (n=44)

Demographic and clinical characteristics		Total (n=44)	Study Group		X ²	p-value
			Control (n=22)	Intervention (n=22)		
Age , Mean (SD)		48.93 (15.45)	50.41(16.03)	47.45(16.03)	214.5*	0.518
Gender, n (%)	Male	26 (59.1)	15 (68.2)	11 (50)	1.504 ¹	0.220
	Female	18 (40.9)	7 (31.8)	11(50)		
Education level, n (%)	Primary	10 (22.7)	3 (13.6)	7 (31.8)	2.071 ¹	0.150
	Secondary	34 (77.3)	19 (86.4)	15 (68.2)		
Diagnosis, n (%)	Medical	25 (56.8)	14 (63.6)	11 (50)	0.834 ¹	0.361
	Surgical	19 (43.2)	8 (36.4)	11 (50)		
Using Ventilator before, n (%)	Yes	6 (13.6)	3 (13.6)	3 (13.6)	0.000 ¹	1.000
	No	38 (86.4)	19 (43.2)	19 (43.2)		
Duration of ventilator use, Mean (SD)		8.68 (9.21)	11.00 (11.30)	6.36 (5.9)	173.0*	0.103
Type of Airway	OETT	28 (63.6)	14 (63.6)	14 (63.6)	0.000 ¹	1.000
	Other	16 (36.4)	8 (36.4)	8 (36.4)		
Ventilation mode, n (%)	SIMV	11 (25)	4 (18.2)	7 (31.8)	1.091 ¹	0.296
	CPAP	33 (75)	18 (81.8)	15 (68.2)		
PEEP (cmH ₂ O), Mean (SD)		7.75 (2.30)	7.73 (2.53)	7.77 (2.11)	223.0*	0.647
FiO ₂ , mean (SD)		0.38 (0.06)	0.38 (0.06)	0.39 (.0.06)	215*	.0459

SD, standard deviation, OET, Oral Endotracheal Tube, TT, Tracheostomy tube, CMV, Controlled Mandotary Ventilation, SIMV, Synchronize Intermittent Mechanical Ventilation, CPAP, Continuous Positive Airway Pressure, PEEP, Positive End Expiratory Pressure, FiO₂, Friction of Inspired Oxygen.

¹Chi-square test

*Mann-Whitney U Test

The mean difference is significant at p< 0.05

Table 2: Comparison of baseline physiological parameters and anxiety scores mean differences (n=44)

Pretest Mean (SD)	Group		Mean different	df	t	p-value
	Control (n=22)	Intervention (n=22)				
HR	92.18 (8.79)	96.23 (22.89)	-4.05	42	-0.77	0.44
SBP	130.45 (17.43)	139.64 (24.36)	-9.18	42	-1.44	0.16
DBP	71.73 (11.29)	70.64 (15.24)	1.09	42	0.27	0.79
MAP	90.91 (10.22)	92.86 (18.32)	-1.96	42	-0.44	0.66
eTV	436.05 (105.14)	454.59 (120.11)	-18.55	42	-0.55	0.59

HR, heart rate; SBP, systolic blood pressure; DBP, diastolic blood pressure; MAP, mean artery pressure; eTV, expired tidal volume; Independent T test

The mean difference is significant at p<0.05

Table 3: Comparison of median differences of baseline physiology parameters (n=44)

Pretest Mean Rank	Group				U	p-value
	Control (n=22)		Intervention (n=22)			
	Mean Rank	Sum of Ranks	Mean Rank	Sum of Ranks		
RR	25.73	566	19.27	424	171	0.10
SpO2	22.73	500	22.27	490	237	0.90

RR, respiratory rate; SpO2, pulse oxygen saturation

Mann-Whitney U Test

The mean difference is significant at $p < 0.05$

Pretest posttest Means Differences

Paired T tests revealed that means differences of pretest-posttest of HR, SBP, DBP, MAP and eTV, as well as the Wilcoxon Signed test for RR and SpO2, were statistically not significance ($p > 0.05$). These findings are presented in Table 4 and Table 5.

Table 4 : Comparison of Pretest – Posttest Means Differences Among Groups

Outcome	Group	Mean ± SD	t	df	p	Effect size	CI
HR	Control	1.91 ± 6.85	1.31	21	0.21		-1.13 – 4.95
	Intervention	-0.64 ± 6.28	-0.48	21	0.64		-3.42 – 2.15
SBP	Control	-3.14 ± 10.60	-1.39	21	0.18		-7.84 – 1.56
	Intervention	1.00 ± 17.76	0.26	21	0.79		-6.87 – 8.87
DBP	Control	0.23 ± 4.69	0.23	21	0.82		-1.85 – 2.31
	Intervention	1.00 ± 8.04	0.58	21	0.57		-2.57 – 4.57
MAP	Control	-1.27 ± 5.75	-1.04	21	0.31		-3.83 – 1.28
	Intervention	0.59 ± 11.77	0.24	21	0.82		-4.63 – 5.81
eTV	Control	12.96 ± 76.75	-0.79	21	0.44		-46.98 – 21.07
	Intervention	4.82 ± 79.01	0.29	21	0.78		-30.21 – 39.85

SD, standard deviation; HR, heart rate; SBP, systolic blood pressure; DBP, diastolic blood pressure; MAP, mean artery pressure; eTV, expired tidal volume.

Dependant Paired T test

The mean difference is significant at $p < 0.05$

Table 5 : Comparison of Pretest – Posttest Means Differences Among Groups

Parameter	Group	Mean ± SD		Median		z	P value
		Pre	Post	Pre	Post		
RR	Control	23.05 ± 8.06	22.55 ± 8.00	21.50	22.00	-0.88	0.38
	Intervention	19.45 ± 5.41	21.18 ± 6.97	18.50	19.00	-1.54	0.12
SpO2	Control	98.64 ± 1.99	98.59 ± 1.92	100.00	99.50	-0.30	0.76
	Intervention	98.73 ± 1.67	99.00 ± 1.57	99.50	100.00	-1.47	0.14

RR, respiratory rate; SpO2, pulse oxygen saturation

Wilcoxon Signed Ranks Test

The mean difference is significant at $p < 0.05$

In detecting changes on HR, SBP, DBP, MAP, eTV that have been measured repeatedly, Repeated Measures (RM) ANOVAS (Table 6) has been used and RR and SpO2 were tested with Friedman Test.

The findings were yielded statistically no significance in means differences ($p > 0.05$) on the physiological parameters between groups.

Table 6 : Physiological Stress Response and Anxiety Level Over Time

Parameter	G				T				G X T			
	df	F	p	Partial eta-squared	df	F	p	Partial eta-squared	df	F	p	Partial eta-squared
HR	1, 42	0.72	0.40	0.02	3.27, 137.19	2.67	0.04	0.06	3.27, 137.19	1.36	0.26	0.03
SBP	1, 42	1.28	0.26	0.03	3.47, 145.71	0.89	0.46	0.02	3.47, 145.71	0.37	0.81	0.01
DBP	1, 42	0.18	0.68	0.03	6.18, 259.65	0.63	0.72	0.02	6.18, 259.65	1.36	0.23	0.01
MAP	1, 42	0.05	0.82	0.02	4.95, 207.92	0.47	0.80	0.06	4.95, 207.92	0.68	0.64	0.03
eTV	1, 42	0.39	0.54	0.01	4.96, 208.12	0.88	0.50	0.02	4.95, 207.92	0.80	0.55	0.02

HR, heart rate; SBP, systolic blood pressure; DBP, diastolic blood pressure; MAP, mean artery pressure; eTV, expired tidal volume. G, between group effects, T, within-subject effects, G X T, interaction between group and within-subject effects
RM ANOVA

The mean difference is significant at $p < 0.05$

Physiological Stress Response Changes

There were no significance changes for all physiological parameters as tested with RM ANOVAS and Friedman Test, except on HR means scores, within-subject effects ($F(3.27,137.19)=2.69, p=0.04, \text{partial eta-squared}=0.06$, as illustrated in Figure 4.

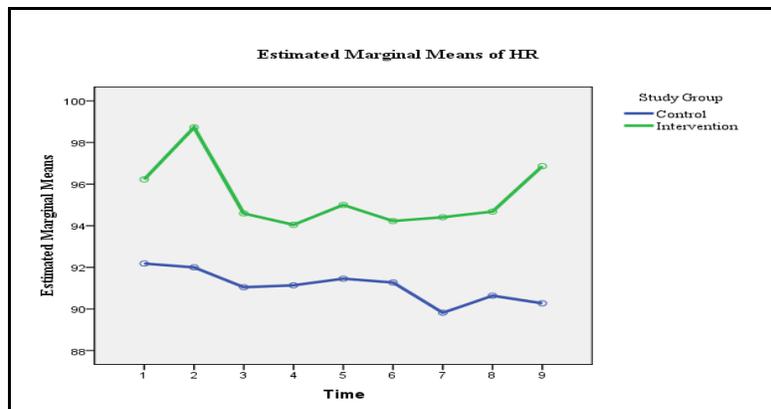


Figure 4 : Mean heart rates among groups over time

DISCUSSION

This study aim is to investigate the effect of a 30 minutes prayer recitations session in reducing stress among Muslim mechanically ventilated patients found that listening to al Fatehah and Yassin recitation significantly have interaction effect over the 30 minutes intervention on within subject effect.

Al though other parameters not significant, however, means HR of within-subject was significantly yielded over time. As presented in Figure 1, the control group whom were rested quietly in their room has lower means HR as the prayer recitation listening group. This result could be due to the effect of background noise reduction/elimination as they were placed in a quiet room with eyes closed, which in turn might have diminished the influences of outside environment.

Although means HR of the intervention were higher than control group, it was significantly found that the means HR of intervention group at beginning was decreased tremendously at the 5 minutes and consistent readings were observed till the recitation ends. However the intervention group's means HR increased back 5 minutes post study. These physiological changes could indicate a relaxed response (Wong et al. 2001).

Cetin (1999) stated that the words of the Qur'an are themselves so beautiful that they must be lovingly pronounced in tones of rhythmic music. The surah Alfatihah and yassin were recited with tartil (slow and measured tone) and permitted tajwid. The ustaz was pronounced each word of the surah in a good and convenience manner which able to make a person to concentrate to listen and may offer more pleasant stimulus. Moreover, the cultural and personal nature of Al-Quran recitation, its commonly believed and considered relaxing (Cetin, 1999).

The means HR of intervention group were higher than control group. Here, the concept of "connectedness" leads to the unprecedented amount of physical illness (Warber et al. 2011). As Warber stated that when people feel disconnected from themselves, their creator, and the web of life, they feel separated and creates feelings of fear, anger, anxiety, depression, and hopelessness. Therefore, listening to the recitation of Holy Quran as a spiritual intervention helps individuals reconnect to the source of life to allow them to relief from the effect of being disconnected and reconnect them back to their creator at the same time they will feel less fear and hopeful (Warber et al. 2011).

Muslim beliefs that when you are reciting versus from Al-Quran it will connect you to Allah (Hweidi, 2007). In hadith as narrated by Jabir, the Prophet Muhammad said that, the best recite of the Quran is the man who when he recites the Quran, you belief is the most fearful of Allah. Therefore, when participants' means heart rate who is the prayer recitation group higher as compared to the control group may indicate that they fear to Allah, fear to the test from Allah and reconnect them to Allah as their creator. This effect has mentioned by Allah in his beautiful book at surah Az Zumar (39:23) stated that; "Allah has sent down the best statement: a consistent Book wherein is reiteration, the skins shiver there from of those who fear their Lord and then their skins and their hearts relax at the remembrance of Allah". This is an evidence to explain why the participants' of the intervention group HR is higher than the control group.

Limitations of the study

The findings of this study are indeed useful, but caution in interpreting the data should be exercise because of the following limitations. First, limited population and sample size to have adequate data to be analyzed, there was no available chapter to be selected by patients, participants were asked to listen to the prayer recitation which has been culturally believed as a most common chapters recite by Muslim in Malaysia (Deuraseh & Tohar, 2007). These chapters of Holy Quran were recited by someone else. Although recited by pious man, it is much better if they are recited by patient her/himself or by their close relatives. However in order to standardize the reading throughout the study in term of the rhythm, therefore the recitation was recorded from a pious men who skillful in term of the rules of Al Quran recitation.

Second, the study only measured the immediate pre-post intervention effect. The presence or absence of any long-term effects was not examined as we focused on a single 30-minute session on mechanically ventilated patients. We did not compare its effect with repeated sessions because such longer term, repeated intervention was beyond the scope of the study. Therefore, findings of this study cannot claim any generalized conclusions in terms of duration and number of session (therapeutic dosage) for prayer recitation listening. Further research is needed to determine the appropriate frequency and length of the music intervention and thus determine whether the intervention could influence outcomes such as number of ventilator-dependent days, length of ICU stay, medical

diagnosis, ventilator mode, type of airway, FiO₂ and eTV. Undoubtedly although this study included a relatively wide age range, a single session and a limited choice of surah, these may set the scene for more focused investigations.

Third, all participants were from ICU as other ventilated patients outside of ICU were poor in prognosis. Furthermore, the open setting of the unit causes restriction for the study to be carried out due to inability to provide quiet environment. Besides that, the limited bed numbers and low admission rate are also contributed as factors for small sample size.

Fourth, short period of time for data collection make the chance to have more samples became limited, as the admission rate for only Muslim patients are very small. Since, patients who are critically ill needs sometimes to recover, to be free from sedation and ready for weaning with full alert and calm to participate into the study.

Implication and recommendation to nursing

Findings suggest that prayer listening has beneficial effects HR on Muslim mechanically ventilated patients and same benefits may influence other religious since Malaysia is a multi-religion country.

Nursing practice

Nurses can provide or encourage patients or their relatives to recite or listen to the Holy Quran recitation as its inexpensive and non-invasive nature. This nursing intervention provides nurses another complementary alternative care in preparing comfort environment for the mechanically ventilated patients to provide psychospiritual comfort.

Nursing Education

For the nursing education, managing patients' psychospiritual comfort should be reemphasized when the nursing students are studied intensive care nursing. Assessment of psychospiritual needs and spiritual intervention such as Holy Quran recitation can be advised to patients and family members to alleviate patients' stress. This can be exercised in case study. They are also can be exposed to think about an essential research on this matter.

Nursing administration

Nursing leaders whom in-charge of in-service education should plan and provide continuous nursing education periodically, consistently and holistically (especially the psychospiritual needs) in term of improving nursing services in the healthcare institution. This platform enable nurses to be exposed to the psychospiritual needs by sharing through evidence base practice and they discuss about prayer recitation as alternative care pertaining to their experience in the clinical area. They might be alert with the patients in the unit needs and advise patients' and their relatives about the effects of psychospiritual intervention as an alternative ways to prevent ICU complication as they are aware about the effects. This will allow nurses to have critical thinking rather than doer only as routine practice of the unit.

Nursing Research

Continuous clinical and academic researches are required and the main limitation on the sample size and therapeutic dosage, therefore further and depth research on this should be continued for future researcher. The research should suggest complementary therapies to enhance psychospiritual comfort and reduced complications among critically ill patients. The nonpharmacological effects of the prayer recitation need to be examined thoroughly as this intervention may helps to reduce usage of sedative for mechanically ventilated patients.

CONCLUSION

The results of this study build on the existing evidence of physiological and psychological benefits from a single 30-minute prayer recitation listening session for Muslim mechanically ventilated patients in ICU settings. Listening to holy quran recitation is well known intervention of choice in addressing spiritual needs of critically ill Muslim patients in critical care settings as to connect them to their creator.

The future researcher should consider that listening to holy Quran recitation as a complementary intervention, which is noninvasive and not expensive for nurses in a prime position to make appropriate therapeutic use in caring for patients requiring mechanical ventilation. Further intensive research with larger sample size should be conducted to evaluate the non-pharmacological effects of Holy Quran recitation and recommendation can be made to reduce the usage of pharmacological sedative drugs which has many side effects to the mechanically ventilated patients.

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