



## RESEARCH ARTICLE



# Cardiovascular Response to Manual Acupuncture Needle Stimulation among Apparently Healthy Nigerian Adults

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## Abstract

This study investigated experience with acupuncture needle stimulation of apparently healthy adult Nigerians and the responses of the systolic blood pressure (SBP), diastolic blood pressure, heart rate (HR), and rate pressure products (RPP) to acupuncture at both real acupuncture points relevant to the treatment of cardiovascular disorder and sham acupuncture points not relevant to the treatment of cardiovascular disorder. Seventy-eight participants were randomly placed into three groups: the real acupuncture group (RAG); the sham acupuncture group (SAG); and the control group, with 26 participants per group. Data were collected preintervention, 15 minutes into acupuncture stimulation, postintervention, and 15 minutes after intervention. Changes (postintervention – preintervention scores) in the SBP, HR, and RPP were statistically lower in the RAG than in the SAG. Changes in the DBP showed a significant difference between the SAG and the RAG ( $p > 0.05$ ). Findings from this study showed that among apparently healthy Nigerian adults, acupuncture needle stimulation at acupoints relevant to cardiovascular disorders

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was more effective than sham intervention in reducing the SBP, HR, and RPP. Participants reported heaviness, numbness, and increasing pain, but no dizziness, fainting and/or life-threatening side effects, during and after the acupuncture needle stimulation.

## 1. Introduction

Scientific advances in acupuncture research, coupled with the side effects of treating certain medical conditions by using conventional drugs, have promoted public interest in and demands for acupuncture dramatically in recent times [1–3]. Over 90% of physicians are estimated to have used acupuncture in German pain clinics and, in the USA, over 11,000 physicians have an interest in acupuncture [1]. Moreover, in the UK, veterinarians, nurses, chiropractors, physiotherapists, and naturopaths use acupuncture even more than physicians [1]. Acupuncture and shiatsu massage accounted for 61% of all treatments provided in a clinic in a study conducted among patients treated in the Clait Health Services in Israel. However, data on public interest, patterns of use, and effects and side effects of acupuncture treatment among Nigerians and sub-Saharan Africans are limited.

The most common reason patients seek acupuncture treatment is a musculoskeletal condition [4]. Recently, a few studies from Africa in which the efficacy of acupuncture in the management of gynecological condition, work-related musculoskeletal disorders, postsurgical spinal rehabilitation, and ergonomic intervention have been reported [5–9]. However, the effects of acupuncture treatment are not limited to pain reduction in neuromusculoskeletal conditions alone; they are widespread and involve the cardiovascular, as well as other, systems. Published studies on laboratory animals and humans have reported that acupuncture has a beneficial effect on cardiovascular parameters such as the blood pressure [10–13]. Studies on the cardiovascular responses to acupuncture among Nigerians and people of the black African race are scarce, and the results of studies from other parts of the world demonstrating the effects of acupuncture treatment of cardiovascular diseases are not consistent.

As early as the 1950s, results from many clinical studies suggested that acupuncture had an effect on the cardiovascular parameters in patients with essential hypertension [14,15]. In 1975, acupuncture was found to significantly reduce the systolic blood pressure (SBP) and the diastolic blood pressure (DBP) in 24 of 28 patients with essential hypertension, but the conclusions drawn were not credible because all of the studies were either observational or case reports, with small sample sizes, unrigorous designs, and control group interventions that were medications or other blood pressure lowering therapies [15]. Taken as a whole, the current evidence is not good enough to make unequivocal claims as regards to both the cardiovascular responses to acupuncture and the efficacy of acupuncture for treating cardiovascular disease among Nigerians and people of the black African race. Ethnic differences in responses to pharmacological agents capable of altering cardiovascular parameters have been reported [16,17]. Thus, the cardiovascular response to acupuncture treatment might vary from one ethnic group to another. In addition, many healthcare professionals in Nigeria are reluctant to recommend acupuncture because its effects on cardiovascular

parameters remain controversial and because the physiological mechanisms determining its actions among people of the black African race are largely unknown. Thus, the present study is a preliminary study carried out to answer the following questions: What would be the experience of participants undergoing acupuncture needle stimulation? Would selected cardiovascular parameters among adult Nigerians who received acupuncture needle stimulation at acupoints relevant to the treatment of cardiovascular disorders (real acupuncture) be different from those among adult Nigerians who received acupuncture needle stimulation at acupoints not relevant to the treatment of cardiovascular disorders (sham acupuncture) and from those among adult Nigerians in the control group (no acupuncture needle stimulation)? Would real acupuncture and sham acupuncture stimulation affect the changes in the selected cardiovascular parameters differently? The outcome of this preliminary study will add to existing information on the impact of acupuncture on selected cardiovascular parameters in apparently healthy adults, especially apparently healthy adults of black African origin. It will also be useful in designing a future, large, randomized, controlled trial in which the effects of acupuncture treatment on blood pressure among Nigerians with hypertension will be investigated.

## 2. Materials and methods

This research was designed as a randomized, controlled trial in which all conditions were the same for both the experimental and the control groups, with the exception that the experimental groups received either real acupuncture or sham acupuncture needle stimulation and the control group received no needle stimulation. This study included 78 participants, with 26 participants in each of the three groups, two experimental groups, and one control group. This sample size was adopted from a similar study carried out by Cené et al [18].

Approval to carry out this study was obtained from the Research and Ethics Committee of the University of Maiduguri Teaching Hospital, Maiduguri, Nigeria. Detailed information on what the study was about, its potential benefits and possible side effects, and what would be expected of the participants during the study was provided on a participant information sheet, which was made available to the participants prior to the intervention. Participants were required to sign a written informed consent, and they were given enough time to consult with their doctors to decide if they would be suitable for this trial.

Apparently healthy volunteers from among the staff and the students of the University of Maiduguri and the University of Maiduguri Teaching Hospital (UMTH) participated in this study. Recruitment posters and handbills were distributed to prospective participants in the outpatient clinics of UMTH. Recruitment posters were also displayed on notice boards at strategic areas within UMTH.

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