

Study of the Therapeutic Effects of Proximal Intercessory Prayer (STEPP) on Auditory and Visual Impairments in Rural Mozambique

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Background: Proximal intercessory prayer (PIP) is a common complementary and alternative medicine (CAM) therapy, but clinical effects are poorly understood, partly because studies have focused on distant intercessory prayer (DIP).

Methods: This prospective study used an audiometer (Earscan[®] 3) and vision charts (40 cm, 6 m “Illiterate E”) to evaluate 24 consecutive Mozambican subjects (19 males/5 females) reporting impaired hearing (14) and/or vision (11) who subsequently received PIP interventions.

Results: We measured significant improvements in auditory ($P < 0.003$) and visual ($P < 0.02$) function across both tested populations.

Conclusions: Rural Mozambican subjects exhibited improved audition and/or visual acuity subsequent to PIP. The magnitude of measured effects exceeds that reported in previous suggestion and hypnosis studies. Future study seems warranted to assess whether PIP may be a useful adjunct to standard medical care for certain

patients with auditory and/or visual impairments, especially in contexts where access to conventional treatment is limited.

Key Words: audition, complementary and alternative medicine (CAM), intercessory prayer, spirituality, vision

Proximal intercessory prayer (PIP), a term we coined to refer to direct-contact prayer, frequently involving touch, by one or more persons on behalf of another—is one of the commonest complementary and alternative medicine (CAM) therapies. Pentecostals and Charismatics—the fastest growing subgroups of Christianity—often pray for their own healing and request distant intercessory prayer (DIP), but they consider PIP to be particularly efficacious. Pentecostals model PIP on New Testament accounts of Jesus and his disciples laying hands on the sick. Pentecostals conceptualize the Holy Spirit’s “anointing,” sometimes represented by oil, as a tangible, transferable substance, or love energy, communicated through human touch. Comparing anointing with electricity or radiation therapy, Pentecostals believe efficacy correlates with frequency and length of exposure, types of prayers, and

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Key Points

- Although commonly employed as a complementary and alternative medicine (CAM) therapy, the clinical effects of proximal intercessory prayer (PIP) are poorly understood, partly because most research has focused on distant intercessory prayer (DIP).
- This study found a significant effect of PIP on auditory function across the tested population ($P < 0.003$).
- This study found a significant effect of PIP on visual function across the tested population ($P < 0.02$).
- Further study seems warranted to assess whether PIP may be a useful adjunct to standard medical care for certain patients with auditory and/or visual impairments, especially in contexts where access to conventional treatment is limited.

“faith” and anointing levels of those receiving and offering prayer. Some persons are considered more anointed than others or as “specialists” in praying for specific conditions.

Scholarly research on the therapeutic effects of intercessory prayer and other forms of “distant” healing has flourished in the past two decades. However, most studies have focused on DIP rather than PIP and/or failed to differentiate PIP from healing techniques such as Therapeutic Touch and external qigong that posit a different healing mechanism (eg, *prana*, *qi* vs Holy Spirit, Jesus) and may engender correspondingly different levels of anticipated efficacy. There is an inadequate evidential basis for generalizing findings from studies of one class of healing technique to another, yet researchers persist in making such generalizations.¹ The resultant literature has yielded uncertainty as to whether prayer and/or distant healing is therapeutically beneficial, neutral, or detrimental.^{2,3}

Of particular concern are findings like those of a well-publicized “STEPP” (Study of the Therapeutic Effects of Intercessory Prayer) paper, which concludes that “intercessory prayer itself had no effect on complication-free recovery from CABG (coronary artery bypass graft), but certainty of receiving intercessory prayer was associated with a higher incidence of complications.”⁴ Notably, one of the three groups of intercessors, the only Protestant group, included in the study, Silent Unity, Lee’s Summit, MO, has a theology and practice of intercessory prayer that differs so widely from Pentecostal prayer that the study analyzed an essentially different phenomenon: ie, Unity is a New Thought group that understands prayer not as supplication to a deity outside the self, but as an exercise of the divine/human power of mind. Unity cofounder Myrtle Fillmore taught: “We do not promise to say a prayer of words and have the saying work a miracle in another individual. Our work is to call attention to the true way of living and to inspire others to want to live in that true way.”⁵

Most studies have, moreover, in seeking to avoid confounds resulting from patients’ knowledge that they are receiving prayer, focused on DIP. Although several prospective, double-blind, randomized, controlled clinical trials concluded that DIP has positive therapeutic effects,^{6–8} interestingly, Matthews et al⁹ found no significant effect for patients receiving DIP, but found a significant benefit for patients receiving PIP. Although acknowledging possible confounds of Hawthorne and placebo effects, Matthews’s study design better corresponds with pentecostal PIP. Unfortunately, the condition isolated for study, rheumatoid arthritis, is relatively susceptible to psychosomatic improvements.¹⁰ Notably, Matthews et al⁹ reported that improvements in swollen and tender joints and reduction in pain and functional disability was not accompanied by a parallel reduction in serum inflammatory markers, suggesting that “clinical improvement might be attributable more to alteration of patients’ perceptions regarding their illness than to changes in inflammatory pathways affecting their joints.”

Our study follows Matthews in focusing on PIP, but diverges by isolating two conditions, auditory and visual im-

pairments, that are relatively less sensitive to, although not unaffected by, psychosomatic factors.^{11,12} Indeed, researchers have investigated effects of suggestion and hypnosis on vision and hearing and claimed significant effects.^{13–15} We pursued two research questions: 1) Does PIP result in measurable effects? If so, 2) how does the magnitude of effects compare with suggestion and hypnosis findings?

Materials and Methods

Subjects were recruited prospectively at Charismatic Protestant meetings cosponsored by Iris Ministries (headquartered in Pemba, Cabo Delgado, Mozambique) and Global Awakening (headquartered in Mechanicsburg, PA), at four locations in Mozambique. The site was selected because Iris leaders are widely reputed among Pentecostals globally as “specialists” in praying for those with hearing and vision impairments—especially during village outreaches in rural Mozambique.¹⁶

During evangelistic meetings (4–12 June 2009, in Impiri, Namuno, and Chiúre villages and Pemba city) Iris leaders invited the “deaf” and “blind” to designated areas to receive prayer for healing by themselves and other Western and Mozambican affiliates. Every consecutive subject was included in the study who received prayer for vision or hearing loss and assented to diagnostic tests (all subjects assented). We provided study information sheets in Portuguese and offered Makua (local language) translation. Measurements were taken immediately before and after PIP.

PIP Methods

Western and Mozambican Iris and Global Awakening leaders and affiliates who administered PIP all used a similar protocol. They typically spent 1–15 minutes (sometimes an hour or more, circumstances permitting) administering PIP. They placed their hands on the recipient’s head and sometimes embraced the person in a hug, keeping their eyes open to observe results. In soft tones, they petitioned God to heal, invited the Holy Spirit’s anointing, and commanded healing and the departure of any evil spirits in Jesus’ name. Those who prayed then asked recipients whether they were healed. If recipients responded negatively or stated that the healing was partial, PIP was continued. If they answered in the affirmative, informal tests were conducted, such as asking recipients to repeat words or sounds (eg, hand claps) intoned from behind or to count fingers from roughly 30 cm away. If recipients were unable or partially able to perform tasks, PIP was continued for as long as circumstances permitted.

Measurement Methods

We prospectively evaluated a consecutive series of 24 Mozambican subjects (19 males/5 females) reporting auditory (14 subjects) and/or visual (11 subjects) impairments who received PIP. One subject reported both hearing and vision impairment. Three subjects (eg, Subject A in Supple-

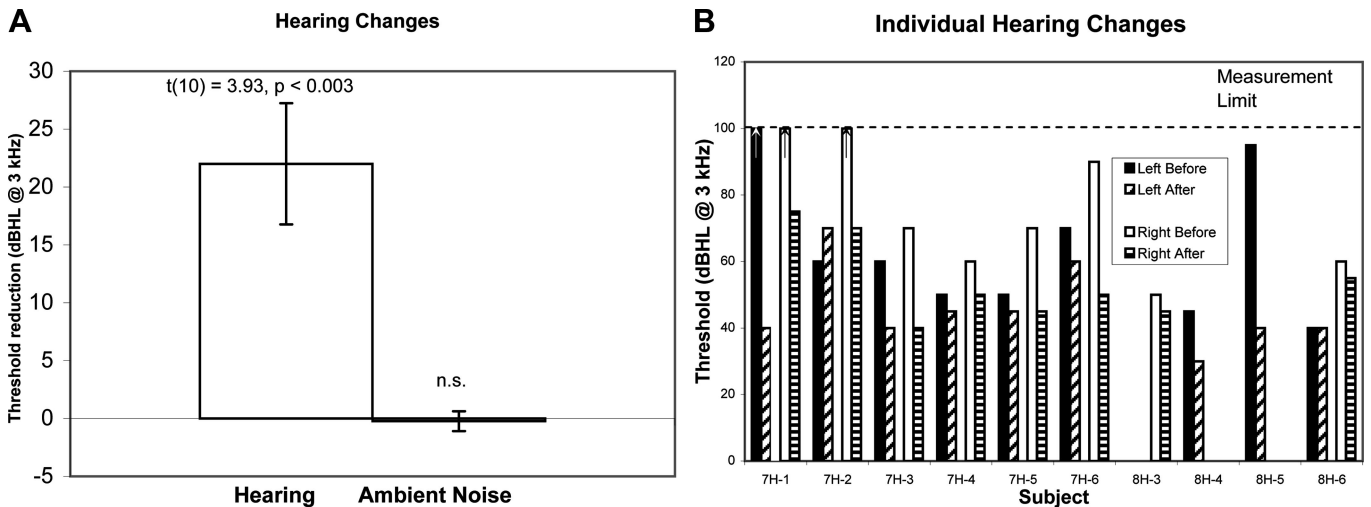


Fig. 1 Auditory results. *A*, Hearing thresholds at 3 kHz were significantly improved across the population. Improvements cannot be accounted for by reductions in AN (dB SPL). *B*, Hearing threshold changes ranged from a 10 dB HL increase to over 60 dB HL improvement.

mental Digital Content, <http://links.lww.com/SMJ/A1>) were excluded from analysis because of false positive responses during audiometric testing. Due to field-imposed time constraints, those subjects who self-reported improvements were given priority for retesting after PIP; we lacked time to re-test two subjects, so we reported them as unimproved. Also because of time constraints, some subjects reporting problems only in one ear were only tested (pre- and post-PIP) in that ear. No subject ordinarily wore hearing aids or corrective lenses.

For hearing assessment, a handheld audiometer (Earscan ES3, Micro Audiometrics Corp, Murphy, N.C., calibrated 3 months prior to the study, with calibration valid for 12 months) was used to measure hearing thresholds. Measurements could not be conducted in an acoustically isolated room due to the remote field location, and the high ambient noise (AN) from the nearby crowd of people presented a considerable challenge to measurement accuracy. AN was measured with a sound meter (Tenma model 72-935) in dB SPL in order to investigate whether its fluctuations presented a potential confound in the before vs after PIP measurements; maximum and minimum AN was tested for each subject during both pre- and post-tests.

Due to time constraints, hearing thresholds were measured for all subjects only at 3 kHz in each ear separately instead of across the whole frequency spectrum; we took additional measurements as time allowed. A total of 18 ears in 11 individuals with hearing impairments were analyzed. The maximum intensity that could be generated by the audiometer was 100 dB HL. Subjects responded by button press or verbally. Subjects whose pre-PIP hearing thresholds exceeded 100 dB HL were assigned a conservative 105 dB HL threshold for subsequent analysis. The measurement protocol followed the standard Carhart-Jerger method.¹⁷ (See Supplemental Digital Content, <http://links.lww.com/SMJ/A1>.)

Eleven visually impaired subjects were tested using 40 cm (6 subjects) and/or 6 m (5 subjects: this chart was used for elderly subjects reporting distant vision problems) logarithmic, “Illiterate E” visual acuity charts (Precision Vision, La Salle, Ill.), using both eyes together, or with each eye separately as time allowed. The minimum measurable acuity was 6/120 on the 40-cm chart and 6/30 on the 6-m chart. A pre-measured string was used to hold charts at the appropriate distance. As researchers pointed to each letter, subjects pointed or verbally indicated which direction it faced; researchers did not indicate whether responses were correct, making it less likely that subjects memorized the chart.

Results

Audition

There was a highly significant improvement in hearing across the 18 ears of 11 subjects ($t(10) = 3.93, P < 0.003$, two-tailed) (Fig. 1). Two subjects showed hearing thresholds reduced by over 50 dB HL. AN was very high during testing (50–100 dB SPL), but AN (85 dB SPL), calculated for each subject individually as the average of the minimum and maximum noise during measurement was unchanged between pre- and post-PIP tests ($t(10) = -0.48, P = 0.64$, two-tailed), indicating that AN was not likely to be a confound (Fig. 1, *A*). The average 3 kHz threshold after PIP was 49.4 dB HL, which was slightly high, perhaps due to high AN.

Vision

Significant visual improvements (both difference and ratio of before vs after) were seen across the tested population (Wilcoxon signed rank test $z = 2.49, P < 0.02$, two-tailed) (Fig. 2, *A*). Three of eleven subjects improved from 6/120 or

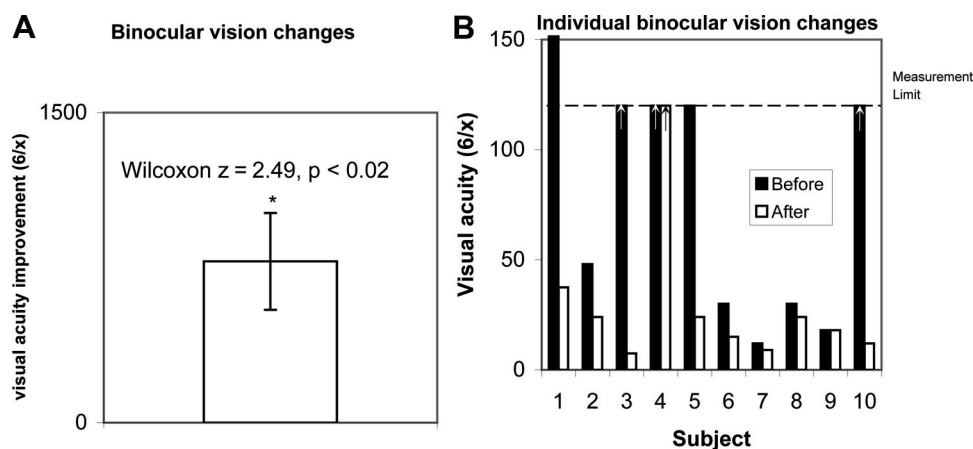


Fig. 2 Vision results. *A*, Binocular visual acuity increased significantly across the population. *B*, Individual improvements ranged from no change to an improvement from $>6/120$ to $6/7.5$.

worse to 6/24 or better, and one subject improved from unable to count fingers at 30 cm (6/2400) to 6/38 (Fig. 2, *B*). All but one vision subject was tested in broad daylight; the remaining subject was tested after dark, with electricity provided by generator-powered stage lights and a flashlight (See Subject E in Supplemental Digital Content, <http://links.lww.com/SMJ/A1>); the lighting level did not appear improved between the pre- and post-test (conducted less than one minute later), making it unlikely that variable lighting was a confound.

Discussion

Both auditory ($P < 0.003$) and visual ($P < 0.02$) improvements were statistically significant across the tested populations. Generally, the greater the hearing or vision impairment pre-PIP, the greater the post-PIP improvement.

There are several limitations of the study. First, field conditions were challenging. There were no modern clinical facilities available, and we were unable to diagnose the etiology of auditory or visual impairments or to assess whether structural changes occurred. There is no way of knowing whether hearing changed at untested frequencies, or whether subjects tested only with 40 cm or 6 m charts would have exhibited change with the other chart. Second, although the study was prospective and controlled for some potential confounds such as AN, there was no control group, only a null hypothesis of no significant effect. Third, the study was not double-blinded. In support of experimenter reliability, several audition subjects showed no measurable improvement, despite self-reported improvement.

Studies of PIP by nature expose subjects to suggestions that their conditions will improve. Could observed effects be attributable to suggestion or hypnosis?¹² Sheehan et al¹³ showed that a few minutes of suggestion led to statistically significant visual acuity improvement, but the effect was so small that a subject would not be able to read one line smaller on the Snellen chart. Several studies of hypnotic suggestion showed an average 2^{14} or 2.5^{15} times increase in visual acu-

ity, with the largest reported improvement from 6/60 to 6/6,¹³ despite no measurable changes in ocular refraction. Other studies reported no improvement in vision or auditory thresholds after hypnotic suggestion.¹⁸ A 2004 review article summarizes the results of suggestion and hypnosis studies as failing to demonstrate significant improvements in vision or hearing.¹² The average visual acuity improvement measured here was over tenfold, significantly higher than in suggestion or hypnosis studies (Fig. 3). It seems reasonable, however, that Hawthorne,¹⁹ placebo, hold-back effects,²⁰ and/or empathy²¹ may have contributed to improved function. Conversely, demand effects¹² may also account for some cases in which subjects reported improved hearing (but not vision) despite no measurable improvement. It should be noted, however, that in the Mozambican cultural context, traditional healers typically charge clients more when healing occurs; thus, subjects may have been predisposed to minimize reporting post-PIP improvements.

Practice effects²² might also have contributed to some observed improvement, but these would also be present in hypnosis studies to similar degrees and therefore may not fully account for the larger effects observed here. Furthermore, the amount of practice was minimal at best. Subjects with measurable hearing thresholds experienced the test tones of a given frequency only a few times in each ear, following the Carhart-Jerger protocol. In some cases, the threshold verification pass of the Carhart-Jerger protocol revealed a lower pre-PIP threshold than the initial pass, apparently due to practice effects, and so the protocol continued until the measured pre-PIP psychophysical hearing threshold was stable. In this way, any existing practice effects were largely accounted for already in the pre-PIP test. Subjects with no measurable hearing threshold pre-PIP were deemed deaf in the corresponding ear(s) if they both self-identified as deaf and exhibited no tone response or visible startle response even to tones of 100 dB HL, in which case it is unclear how such an experience might constitute practice. Likewise, visually impaired subjects were allowed minimal experience with the eye chart

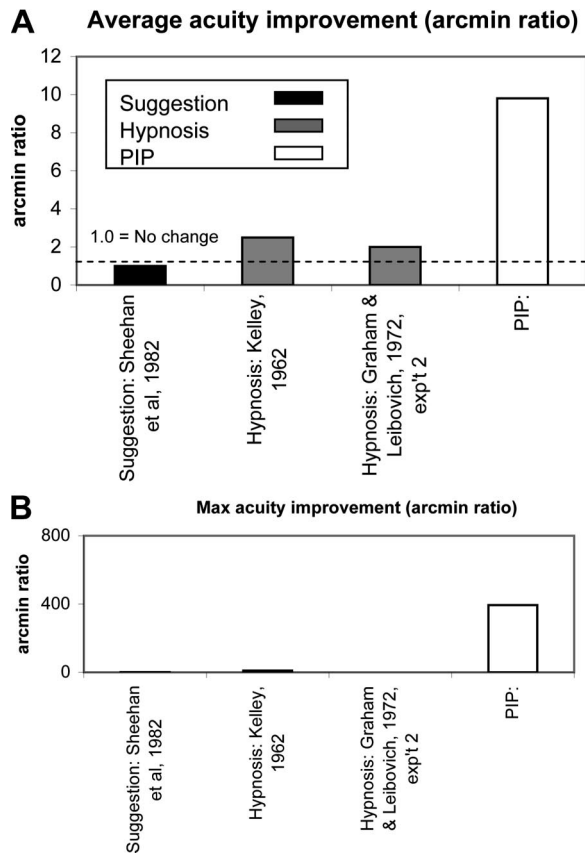


Fig. 3 Comparison with suggestion and hypnosis. *A*, Studies of hypnotic suggestion and suggestion without hypnosis have found small but statistically significant improvements in visual acuity. The magnitude of effects across the population was significantly larger in PIP than in suggestion and hypnosis. *B*, The maximum improvement in visual acuity for PIP was larger than the maximum improvement reported for suggestion and hypnosis.

during the pre-PIP test. They were asked to read as far down the eye chart as they were able to a single time, and care was taken not to reveal the smaller lines below their pre-PIP acuity threshold prior to the post-PIP test. It seems reasonable that subjects whose pre- and post-PIP visual thresholds differed by only one or two lines on the eye chart may have been exhibiting practice effects. It seems much less likely that subjects who went from being unable to read a single line (in which case it is unclear that this experience constituted practice) to reading far down the chart were exhibiting practice effects.

This study leaves unanswered the question of to what extent PIP by different individuals would have resulted in further improvements (or diminishments) in function. One particular Iris leader was involved in administering PIP in 13 out of 25 interventions.

This research, which focused on clinical effects of PIP, did not attempt to explain mechanisms by which functional improvements occurred. Future studies might be designed to test whether impairments with certain etiologies are more

susceptible to improvement through PIP, to probe the mechanisms by which PIP produces effects, and to assess whether improvements are long term. It would be desirable to follow-up with subjects several days or weeks after PIP, although systematic follow up would be extremely difficult under similar field conditions (we tried but could only locate one subject for retesting the following day—see Subject B in Supplementary Digital Content, <http://links.lww.com/SMJ/A1>). Conducting similar studies under controlled clinical conditions in North America would be desirable, yet neither Iris nor Global Awakening claims comparable results in industrialized countries (arguing that “anointing” and “faith” are lower where medical therapies are available)—see Supplemental Digital Content (<http://links.lww.com/SMJ/A1>) for our unsuccessful attempts to collect data in the US. Possible control groups for future investigations might include subjects receiving “sham” PIP or Therapeutic Touch. The researchers might use themselves as controls by testing their own hearing in conditions of low and high AN. Effects of AN and subject-subjectivity might be mitigated by using earbuds instead of supra-aural headphones and by utilizing otoacoustic emissions technology.

Our study has three main findings. First, Mozambican subjects did exhibit improved auditory and/or visual acuity subsequent to PIP interventions. Second, the magnitude of measured effects exceeds that reported in previous studies of suggestion and hypnosis. Although it would be unwise to overgeneralize from these preliminary findings for a small number of PIP practitioners and subjects collected in far-from-ideal field conditions, future study seems warranted to assess whether PIP may be a useful adjunct to standard medical care for certain patients with auditory and/or visual impairments, especially in contexts where access to conventional treatment is limited. The implications are potentially vast given World Health Organization estimates that 278 million people, 80% of whom live in developing countries, have moderate to profound hearing loss in both ears, and 314 million people are visually impaired, 87% of whom live in developing countries, and only a tiny fraction of these populations currently receive any treatment.²³

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