

SPECIFYING CONTEXTUAL FACTORS; PROVIDERS ROLE IN PAIN REPORTS AND PLACEBO EFFECTS

Hojjat Daniali¹, Mollie A. Ruben², Per M. Aslaksen³,
Ted J. Kaptchuk⁴ & Magne A. Flaten¹

¹Department of Psychology, Norwegian University of Science and Technology, Trondheim, Norway; ²Department of Psychology, University of Rhode Island, Kingston, USA; ³Department of Psychology, The Arctic University of Norway, Tromsø; ⁴Department of Medical Sciences, Harvard Medical School, Boston, USA

Grant 36/20

Background/rationale: Healthcare providers are a central component of any therapeutic context and have an important influence on pain reports and placebo effects, however, it remains unclear which specific features of providers drive these effects.

Aims: The overall aim of this project was to investigate the effects of providers features on pain reports and placebo effects.

Methods: The project included three studies. *Study one (S1)* was a systematic review investigating the effects of providers characteristics (sex and status) and their nonverbal behaviours (NBs) on pain reports and placebo effects. *Study two (S2)* entailed two experiments on dental pain patients. Experiment 1 examined the effects of type of information about a dental procedure (positive vs. neutral). Experiment 2 examined whether the delivery method of positive information, provided openly by the treatment team, or delivered without the team's awareness (hidden administration), affected reported pain during the dental procedure. *Study three (S3)* examined the effects of singular positive NBs displayed by videotaped experimenters, on pain reports. Participants were randomized to one of four groups, each exposed to positive facial expressions, tone of voice, body movement, or neutral NBs. Pain, stress, arousal, and cardiac activity were assessed at pre-test, conditioning phase, and at post-test. Four minutes of heat pain was induced in each test, and a placebo cream was administered before the conditioning and post-test in all groups.

Analysis: *S1* was a qualitative systematic review of 32 studies on clinical pain populations and healthy subjects. *S2* was a pre-registered multi-experiment and tested 96 dental patients across two experiments. *S3* was a thermal pain experiment testing 104 healthy participants.

Results: *S1* showed that lower pain reports were associated with providers of the opposite sex. Higher provider status, professionalism, competence, and confidence resulted in stronger placebo effects and lower pain reports. Positive NBs were associated with higher placebo effects and lower pain reports, whereas negative NBs were linked to higher pain reports and nocebo effects. In *S2*, positive information about the dental procedure reduced pain by approximately 50% compared with neutral information (Experiment 1). However, this effect disappeared when the positive information was delivered by a dental assistant who was not involved in the treatment (Experiment 2). In *S3*, the different singular positive NBs produced similar effects on pain reports. However, positive facial expressions were perceived as more caring than neutral NBs.

Discussion: *S1* showed that provider characteristics and NBs impacted pain reports and placebo effects. In *S2*, positive information reduced pain only when administered by the dental treatment team. Together, these findings confirmed that providers' features

contributed to pain reports and placebo effects. S3 showed that singular NBs of providers had a weak effect on enhancing placebo effects. Overall, these findings suggest that provider characteristics and NBs impact pain reports and placebo effects, in both patients and healthy participants, and that different NBs of providers may exert similar effect on pain.

Keywords: Placebo effects, Pain report, Contextual factors, Nonverbal behaviours, Provider effects

Publications:

Daniali, H. (2024). *Specifying contextual factors: Caregivers' role in pain report and placebo effects – The role of caregivers' characteristics and nonverbal behaviours in pain and placebo effects* [Doctoral dissertation, Norwegian University of Science and Technology (NTNU)]. <https://ntnuopen.ntnu.no/ntnu-xmlui/handle/11250/3130407>

Daniali, H., & Flaten, M. A. (2019). A qualitative systematic review of effects of provider characteristics and nonverbal behavior on pain, and placebo and nocebo effects. *Frontiers in Psychiatry, 10*, 242. <https://doi.org/10.3389/fpsy.2019.00242>

Daniali, H., Hunsbeth, P., & Flaten, M. A. (2024). Effects of open and hidden administration of treatment-related information: A multi-experiment study. *Psychology & Health. https://doi.org/10.1080/08870446.2024.2392820*

Daniali, H., Ruben, M. A., Fiskum, C., Aslaksen, P. T., Kaptchuk, T. J., & Flaten, M. A. (2024). The effect of singular nonverbal behaviours of experimenters on pain reports. *Journal of Pain Research, 1345–1360. https://doi.org/10.2147/JPR.S449150*

E-mail contact: hojjat.daniali@ntnu.no