**Title**: Calibrating risk perception in patients with hypertension using part-to-whole graphics and social comparison framing

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**Purpose**: The Collaboration Oriented Approach for Controlling High blood pressure (COACH) is a patient-facing web-based application connected to the Electronic Health Record. COACH generates guideline-supported messaging and data visualizations using clinician- and patient-supplied data to help patients control their blood pressure. Across two studies, we examined how various risk communication strategies affect perceived risk and behavioral intentions, within the context of COACH.

**Method**: Two Internet samples of patients with hypertension (Study 1 N=100; Study 2 N=110) viewed graphs depicting blood pressure (BP) data for fictitious patients. For each graph, participants rated perceived hypertension control, risk of heart attack and stroke, urgency, worry, and comprehension on a 0-100 slider bar and indicated the preferred action to take in response this BP data (e.g., talk to doctor at next appointment, go to hospital immediately). Using a within-subjects design, all participants evaluated 9 graphs with data that varied in systolic BP mean (130, 145, 165 mmHg) and risk communication strategy [Study 1: control (no risk info), verbal description of risk, social comparison framing (e.g., at or above average risk); Study 2: verbal description of risk, icon array, horizontal bar graph]; see Figure 1. We hypothesized that social comparison framing would increase perceived risk and part-to-whole formats of risk communication (e.g., icon array; horizontal bar graph) would result in more accurate perceptions of risk.

**Results**: In Study 1, risk communication strategy had a significant effect on risk perception, P<.05; perceived risk of heart attack and stroke was highest when no explicit risk information was provided and lowest with the verbal description of risk. Risk communication strategy also impacted recommended actions. 22% of participants endorsed a visit to the Emergency Room (ER) visit when no explicit risk information was provided, compared with only 12% of participants when the social comparison frame was employed. In Study 2, part-to whole formats of risk communication further reduced perceived risk and recommendations to visit the ER (8% endorsed immediate ER visit with icon array; 6% with horizontal bar graph).

**Conclusions**: Providing explicit information about the risk of heart attack and stroke to patients with hypertension results in lower (but more accurate) perceptions of risk associated with uncontrolled hypertension. Without clear descriptions of risk, people may substantially overuse acute care rather than seeking more information.

A screenshot of a graph

Description automatically generated

Figure 1. Risk Communication Strategies used in Study 1 and 2

COACH 2.0 Affective Study 2 (study 1 in the abstract)

Brief overview and thoughts: