D3.1: What Were They Thinking? Cognitions While Using Monitoring Records to Solve Glycemic Control Problems

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Abstract:
**Introduction:** Analysis of self-monitored blood glucose (BG), food intake, medications & activity is a powerful tool for attaining glycemic goals by persons with diabetes (PWD). However, effective problem solving (PS) using monitoring data remains difficult for many even after diabetes self-management (DSM) education. Study purpose was to identify cognitive processes & sources of difficulty when solving glycemic control problems using monitoring records. Aim was to describe pattern recognition, causal inferences, solutions & errors during monitoring record analysis for people with varying skill in DSM.

**Method(s):** A think-aloud technique was used in this exploratory descriptive study to elicit PS thoughts as participants analyzed monitoring records. Participants were a convenience sample of 18 adults with diabetes & 7 certified diabetes educators (CDEs). Responses were recorded, transcribed & analyzed for PS cognitions related to pattern recognition, inference & solution generation. Analysis was ongoing; recruitment ended upon data saturation.

**Results:** PWD age range was 39-65 yr; 83% were female; 72% reported receiving DSM education. Of 12 who remembered their last A1C, 8 reported levels >7.0%. CDEs (4 RN, 3 RD/LD) had 4-29 yr of diabetes education experience. Participants varied in ability to detect patterns, integrate knowledge during PS & evaluate their own hypotheses. CDEs & more skillful PWD were able to infer & reason about multiple possible causes of patterns, suggest ways to test accuracy of their speculations & to propose solutions based on DSM principles. Less skillful PWD focused on isolated BG readings rather than patterns. Their inferences & proposed solutions were based on superficial features of the problem or were narrow in scope. Difficulties
included pattern detection in A1C/BG levels or behaviors & with inferring causation. Errors stemmed from lack of diabetes knowledge or inability to apply knowledge during PS.

**Discussion & Conclusions:** How participants perceived, interpreted & reasoned about monitoring data appeared to reflect a personal mental model of glucose metabolism. Findings provide a basis for designing novel diabetes instruction & assessment methods specifically targeting the cognitive skills essential for diabetes PS using monitoring records.

**Abstract History:**
This abstract has been presented or accepted for presentation in whole or in part at the SNRS or other scientific meeting.

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