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## **Diabetes Treatment Satisfaction Questionnaire (DTSQ) for Spain and Latin America: are multiple language versions really necessary?**

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*Abstract (300 words)*

**Objectives:** To ascertain the need for several same-language adaptations, by comparing 12 Spanish versions of the Diabetes Satisfaction Questionnaire (DTSQ), originally developed in English by Clare Bradley (Bradley and Lewis 1990) and now linguistically validated into over 100 languages.

**Methods:** The original English DTSQ has been translated into two versions for Mexico and the USA instead of adapting the existing Spanish version for Spain. Other Latin American versions were adapted mostly from the Spanish for Argentina, itself originally adapted from the Mexican Spanish. Differences and equivalents are explored: (i) among the 12 language versions; (ii) based on the three main areas of language descriptions (syntax, semantics, pragmatics); and (iii) with regard to the conceptual complexity of the items.

**Results:** The Castilian DTSQ has a higher register, with more formal and detached wording. The other two independent versions (Mexico and USA) include many Anglicisms, as well as shorter and simplified syntax. Notable differences and similarities among the other Latin American versions highlight the possible impact of social factors and usages, and suggest four potential groupings by geographical area: (1) a 'central' American variation (with Guatemala and Venezuela sharing linguistic features with Mexico); (2) the Antilles regions of Dominican Republic and Puerto Rico (with wording analogous to the US version); (3) the Equatorial area of Colombia, Ecuador and possibly Peru (sharing some archaic lexis, repetitive and simplified structures); and (4) the Rio de la Plata region, Argentina (with a slightly more formal register). Linguistic differences concern mainly lexis and semantics. Instructions and Qs.2/3 (perceived frequency of hyper/hypoglycaemia), Q.4 (convenience) and Q.5 (flexibility) showed the most differences.

**Conclusions:** The analysis confirmed the contextual-specificity of questionnaire validity and the necessity for separate versions for Spain, USA and Mexico. Further research is recommended on the possibility of four other 'grouped' versions for Latin America.

**Keywords:** Linguistic validation, Adaptations, Spanish, Spain, Latin America

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