

Knowledge about genetics in diverse populations and associations with attitudes towards genetic testing

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Background

Several studies revealed associations between the extent of genetic knowledge and general attitudes towards genetic testing as well as willingness to undergo genetic testing. Our study aimed to explore the level of genetic knowledge in diverse populations.

Method

Furr and Kelly [1] developed the Genetic Knowledge Index (GKI), which is a five items instrument for the assessment of general knowledge about genetics. In our work, the German version of the GKI had shown inadequate psychometric properties. Therefore, we developed the "Genetischer Wissensindex" (GeWi), a 12-items self-report measure with a dichotomous true/false response mode (Table 1). The sum of correct answers represents an indicator for the extent of genetic knowledge. The GeWi showed good psychometric properties, e. g. $r_{tt}=.77$ [2]. Attitudes were measured using a self-report questionnaire containing 13 items.

The whole sample comprises 944 persons (362 male, 577 female), representing eight different subgroups (see figure 1). The mean age was 31,3 years (range 13-98).

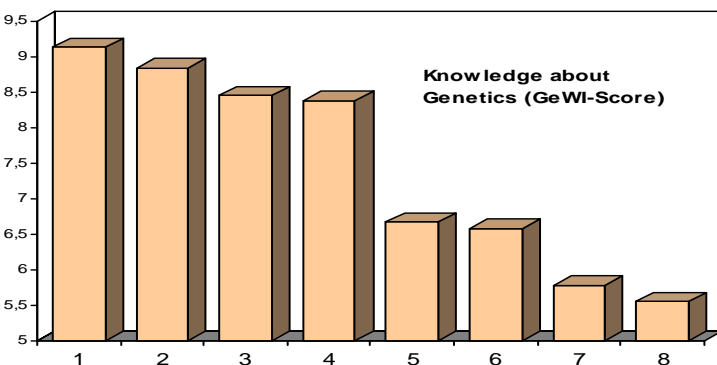


Table 1: Items of the GeWi (preliminary English version), correct answer true/false, % of correct answers (N=944)

- 1) Some genetic disorders occur more often within particular ethnic groups. (true, 68.9 %)
 - 2) Most genetic disorders are caused by a single gene. (false, 45.9 %)
 - 3) Once a genetic marker for a disorder is identified in a person, the disorder can be prevented or cured. (false 85.9 %)
 - 4) Down Syndrome is a genetic disorder. (false, 39.0 %)
 - 5) Viruses can cause alterations of the human genetic make-up. (true, 72.4 %)
 - 6) The human DNA only can be found in the chromosomes. (false, 57.4 %)
 - 7) The X-chromosome contains only genes which influence the genetic sex differentiation. (false, 72.6 %)
 - 8) Each human cell contains chromosomes. (false, 71.8 %)
 - 9) The term „allele“ covers the entirety of a person's genes. (false, 72.8 %)
 - 10) Each cell of an organism contains the same number of chromosomes. (false 50.5 %)
 - 11) Genetic disorders always skip one generation. (false, 95.6 %)
 - 12) Only mothers transmit cystic fibrosis. (false, 75.5 %)
- (The German GeWi is printed on the backside of the handouts.)

Figure 1: General knowledge about genetics in different groups of population (GeWi-Score)

- 1 Physicians (N=69)
- 2 Medical students (N=206)
- 3 Medical psychologists (N=127)
- 4 Members of German Heredoataxia Society (N=130)
- 5 University students (except medicine) (N=166)
- 6 General population (N=113)
- 7 Members of the German Huntington's Disease Society (N=68)
- 8 Persons at risk for HNPCC (N=65)

Results

There were no significant associations between attitudes towards genetic testing and the extent of general knowledge about genetics. Persons holding positive attitudes towards genetics did not indicate a higher level of genetic knowledge (data not shown).

However, there were significant differences between subsamples ($F=53,92$, $p<0.001$). As could be expected physicians, medical students and medical psychologists reported the highest level of knowledge. Persons from the general population had significantly lower scores. The differences between the groups of affected individuals (Heredoataxia, Huntington's disease, HNPCC) might indicate different needs for genetic education. Furthermore, these differences might be an indicator for differing motivation concerning genetic education between these groups.

Discussion

Contrary to other research, we did not find significant associations between level of genetic knowledge and attitudes towards genetic testing. However, our results underline the importance of considering consultants' level of knowledge in genetic counselling. Counsellors should explore clients' genetic knowledge to provide comprehensible information. The German GeWi might be a facilitative instrument in this process. Furthermore, the results extend the evidence concerning the construct validity of the GeWi.

References

- [1] Furr LA, Kelly SE (1999). The Genetic Knowledge Index: Developing a standard measure of genetic knowledge. *Genet Test* 3, 193-199
- [2] Berth H, Dinkel A, Kreuz FR, Balck F (2004). Der Genetische Wissensindex (GeWi) - Ein Instrument zur Erfassung des allgemeinen Wissens über Genetik. *Z Med Psychol* 13, 21-28

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