

RELATIONSHIP OF COMMUNICATION FORMAT WITH THE EFFECTIVENESS OF **INFORMING ABOUT THE RISKS OF CARDIOVASCULAR DISEASES**

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Abstract

Patients understand cardiovascular disease (CVD) risk information better when it is presented in numerical or visual formats (for example, graphs) compared to verbal explanations.

Purpose: To study the extent to which physicians and patients use verbal, numerical, and visual formats when communicating cardiovascular risk factors.

Methods and Results: Socioeconomic data and patients' understanding of the issue were collected using questionnaires and audio recordings of consultations about CVD risk. In 73% of 32 consultations, general practitioners communicated cardiovascular risk using only verbal descriptors, compared to numerical (11%) and visual (16%) formats. Female physicians and female patients were significantly more likely to use verbal formats than visual ones (p = 0.001and p = 0.039, respectively). Patient subjective understanding was significantly higher when visual counseling was used compared to verbal counseling (p=0.001).

Conclusions: It is necessary to identify and address barriers to the use of "high-rating" communication formats among both physicians and patients.

Keywords: Risk communication formats, cardiovascular risk factors, cardiovascular diseases.

INTRODUCTION

One of the main tasks of preventive medicine is to effectively inform patients about the risks and benefits of various treatment options. Risk can be communicated verbally (for example, saying "your risk is high" or "this is not good for your health"), numerically (using absolute percentages, relative percentages, or natural frequencies), visually, or by using a combination of these methods [1,2]. Although there is no definitive evidence as to which format is best for effectively conveying risk, recent studies allow for a ranking of different risk communication formats in terms of their effectiveness and patient understanding. The use of natural frequencies, graphical formats (such as histograms), and their combinations is more comprehensive than using percentages or purely verbal translations of risk [3], and patients prefer these formats over percentages. Patient characteristics such as age, education, cultural background, psychosocial factors, and literacy influence both the understanding of risk information and communication preferences [4]. Numerical literacy encompasses not only the ability to understand numerical data accurately but also the ability to interpret graphical formats, and it affects risk perception, adherence to



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interventions, and even treatment outcomes [5]. An increasing body of evidence indicates that engaging patients in the decision-making process positively influences patient satisfaction, adherence to treatment, and even clinical outcomes. Although more patients are seeking active participation in healthcare decisions, not all do so to the same extent, and there is a call for a full dialogue between patients and physicians leading to shared decision-making.

Cardiovascular risk is often inadequately perceived by primary care patients, leading to either an overestimation or underestimation of the risk. Presenting risk information in understandable formats can correct these misperceptions [6]. Systematic reviews show that providing adults with moderate to high CVD risk information about their overall risk (using various communication formats) improves risk perception accuracy and likely increases their intention to initiate preventive measures [7].

Objective:

To study the extent to which physicians and patients use verbal, numerical, and visual formats for conveying cardiovascular risk factors.

Materials and Methods

We selected an actual physician-patient encounter and evaluated the primary outcome (the format of counseling) using audio recordings rather than self-reports. To study how CVD risk information is conveyed, primary care physicians recorded their consultations with patients at risk for CVD. Physicians willing to participate were visited and informed about the study's aim—to examine risk communication in everyday practice. Participants were then briefed on the data collection details and provided with the necessary materials (multiple copies of questionnaires for general practitioners and for patients), as they were to collect all the data themselves. No specific instructions or risk calculation methods were given to the physicians.

Over the following three months, general practitioners identified eligible patients and invited them to participate in the study based on the following inclusion criteria: age between 35 and 65 years, and the presence of at least one risk factor among dyslipidemia, hypertension, or chronic smoking. Patients who agreed to participate signed an informed consent form prior to the consultation. These consultations were audio-recorded, and both patients and general practitioners completed questionnaires immediately after the consultation. Patient questionnaires included age, gender, education level, ethnicity, and the presence of CVD in first-degree relatives. Self-assessment of understanding, awareness (or appraisal) of CVD risk, and anxiety regarding CVD were measured using a visual analog scale (VAS) ranging from 0 (low understanding, awareness, and anxiety) to 100 (high understanding, awareness, and anxiety). In the questionnaire for general practitioners, they were asked to assess the patient's risk of CVD and his/her anxiety about CVD, also measured on a VAS from 0 (lowest risk and anxiety) to 100 (highest risk and anxiety). All audio recordings and questionnaires were collected three months after the first visit. After transcription of the audio recordings, the data from each consultation were classified by researchers into various formats: verbal, numerical, visual, or combined. A consultation was classified as "visual format" if the audio recording indicated the use of a table or graph.





Results

Out of 18 primary care physicians invited to participate, 6 (33.3%) agreed. In total, 6 physicians were included in the study, providing consultations to 32 patients (ranging from 2 to 8 patients per physician). There were no missing values in the in Table 1.

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Physician characteristic	n	%
Age (years)	46.5 years (range: 38–57)	-
Years of Practice	5–20	—
Workload (%; where 100% = 6 working days per week)	6	100%
Gender, male	4	67%
Patient characteristic	n	%
Age (years)	51 years (range: 45.5–59)	—
Gender, male	19	59%
Ethnicity, Uzbek	32	100%
Education Level – Secondary	21	65.2%
Education Level – Higher	11	34.8%
Number of Cardiovascular Risk Factors = 1	15	46.8%
Number of Cardiovascular Risk Factors = 2	24	75%
Number of Cardiovascular Risk Factors = 3	19	59.3%
Dyslipidemia	21	65.6%
Arterial Hypertension	28	87.5%
Smoking	17	53.1%

 Table 1. Baseline Characteristics of Physicians and Patients

The average age of the participating primary care physicians was 46.5 years (38–57), with 67% being male. The average years of practice for general practitioners was 11 (range: 5–20). The average age of patients was 51 (range: 45.5–59), and 59% were male.

For our primary outcome—the prevalence of various risk communication formats—we calculated the frequency of each format along with the corresponding 95% confidence intervals (CIs). The intraclass correlation coefficient was calculated to assess the agreement between different counseling formats for physicians who conducted at least two consultations. For further exploration of independent factors determining the counseling format used (verbal, numerical, visual), regression analysis was performed including all physician and patient characteristics that showed at least a borderline significant (i.e., p < 0.1) association with the counseling format.

In 23 out of 32 consultations (73%), general practitioners communicated cardiovascular risk to patients using only verbal descriptions. In 4 consultations (12.5%), they combined verbal descriptions with numerical information. Graphical formats were used exclusively in one consultation (3.1%) and along with numerical information in 4 consultations (12.5%). Among the 8 consultations in which numerical information was provided, in three cases only absolute percentages were used, in five cases a combination of absolute risk and natural frequencies was used, and in one case relative risk information was used. Most visual formats (91%) consisted of tables with a color-coding system similar to traffic lights to denote low, medium, and high risk levels. The risk calculation was always based on a 10-year interval. Four out of 6 general practitioners (66.6%) who conducted more than one consultation used the same risk





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communication format throughout all consultations, while 2 switched between different formats. The intraclass correlation for the formats used was 0.63 (95%, p < 0.01) among physicians who conducted more than one risk consultation, indicating a significant clustering effect.

The average consultation time for risk communication was 9 minutes 46 seconds (median 5 minutes 35 seconds), ranging from 1 minute 26 seconds to 32 minutes 04 seconds. During consultations, patients spoke for 24% of the total time.

Female patient gender remained significantly associated with more frequent use of purely verbal descriptors compared to visual formats after controlling for practice type, duration of the physician–patient relationship, patient subjective understanding of the information, the ratio of patient talk time to total consultation time, and the clustering effect of the physician (p = 0.039). Use of the visual format led to a significantly higher subjective understanding by patients compared to purely verbal counseling (the adjusted mean difference was 10.3 (2.7) points on the 0–100 VAS), which remained independently associated after controlling for patient age, gender, education, total consultation time, patient self-assessment of CVD risk, anxiety, and the clustering effect of general practitioners.

Discussion

In this study, 73% of primary care physicians used only verbal formats to inform patients about cardiovascular risk. The combination of numerical and visual formats was used infrequently, as was the combination of verbal and numerical formats. These data highlight a gap between the recommendations of medical associations—which favor numerical and visual formats for risk communication—and actual clinical practice.

Our study found that the frequency of using verbal formats to convey risk was associated with gender: female physicians communicated risk more frequently than male physicians. A similar association, albeit to a lesser extent, was observed among patients regardless of the physician's gender. There is only limited data on gender issues in physician–patient communication; a recent systematic review showed that female physician–patient dyads tend to have longer consultations and combine different communication styles compared to mixed or male dyads [8]. To our knowledge, the association between gender and the choice of risk communication format has not been previously described and warrants further investigation. This tendency of female physicians and female patients to communicate exclusively via verbal formats should also be taken into account when developing educational programs and tools.

The statistically quantitative association between the use of visual formats and patient understanding—as assessed in our study—does not necessarily lead to a clinically significant improvement in overall understanding. However, it is consistent with the literature, which shows that visual formats are easier to understand than other formats, especially verbal ones [9]. Although only a few consultations in our study used visual formats, studies on other visual formats—such as "risk ladders" [10], population diagrams [11], pie charts [12], and histograms [13,14]—demonstrate better understanding, increased risk perception, and improved acceptance of interventions among patients.

The use of color as additional information in visual formats, which was also employed by the participating physicians, appears to be effective and familiar to patients, providing them with an

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important cue regarding the seriousness of the risk (for example, red indicates urgency and the need to change current behavior) [15]. Nevertheless, a significant portion of patients in our sample reported that they subjectively understood the communicated risk quite well when exposed only to verbal descriptions or numerical formats. Sixty-five percent of family physicians used their preferred format consistently, suggesting that—apart from associations with the gender of the physician and patient—the choice of communication format depends more on physician characteristics than on patient characteristics [16]. The discrepancy between the CVD risk and anxiety assessments made by family physicians and those made by patients is significant.

Conclusion

Overall, our data indicate a gap between the recommendations of medical associations and clinical reality in the communication of CVD risk. The predominantly used verbal formats received the lowest ratings in terms of patient understanding and effectiveness. Similarly, the most recommended formats—such as natural frequencies and visual formats like histograms—were rarely used by primary care physicians in our study. Visual formats, however, led to significantly higher subjective understanding of the provided information. In addition, gender was significantly associated with the choice of communication format. Adequate risk communication should be integrated into physician education.

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