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The relationship between uncertainty tolerance and oncologists’ perceptions of large-panel genomic tumor testing

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Introduction
Large-panel genomic tumor testing (GTT) is a new technology that promises to make cancer treatment more precise, but that currently poses many uncertainties regarding its clinical value and appropriate use. Uncertainty Tolerance (UT), a psychological construct that describes trait-level differences in individuals’ responses to uncertainty, may influence oncologists’ perceptions and attitudes regarding GTT.

Methods
Sample. 57 Community-based oncologists participating in a statewide study of large-panel GTT in routine oncology care completed surveys assessing their perceptions and attitudes regarding GTT.

Measures
Perceived uncertainty about GTT (1-item): Genomic tumor testing seems uncertain
Attitudes about GTT (8-items, α = 0.67): GTT seems: beneficial, harmful, accurate, trusted, risky, harmful, complicated, inefficient, trustworthy, complicated, inefficient
Self-efficacy about GTT (4-items, α = 0.82): Confidence in: ability to interpret results, ability to explain results, ability to make appropriate treatment decisions, your practice’s ability to implement GTT

Uncertainty Tolerance (UT). Separate subscales assessed tolerance of 3 types of uncertainty: ambiguity, risk, and complexity
Ambiguity Tolerance (Plan Ambiguity in Medicine Scale; Han et al., 2009) - would not have confidence in a medical test or treatment if experts had conflicting opinions about it. Would not be afraid of trying a medical test or treatment even if experts had conflicting opinions about it.
Risk Tolerance (Pearson Risk Attitude Scale; Pearson et al., 1995) - taking risks does not bother me if the gains involved are high.
Complexity Tolerance (Geller Tolerance for Ambiguity Scale; Geller et al., 1990) - I try to avoid situations that have uncertain outcomes.

Statistical Analysis. The relationship between perceived uncertainty and self-efficacy and attitudes regarding GTT was explored using GLMs. Oncologists’ UT was assessed as a moderator.

Results
Sample Characteristics

<table>
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<th>Years of Experience</th>
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<td>7 (13%)</td>
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</tr>
<tr>
<td>10-19</td>
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<td></td>
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<tr>
<td>20-29</td>
<td>13 (24%)</td>
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<td>30+</td>
<td>10 (19%)</td>
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<table>
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<th>Gender</th>
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<td>Specialty</td>
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<td>Surgery 4 (7.1%)</td>
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<td>Urology 1 (1.8%)</td>
</tr>
<tr>
<td></td>
<td>Neurology 1 (1.8%)</td>
</tr>
</tbody>
</table>

Notes: For this figure, participants median split by different types of uncertainty tolerance into high/low groups.

Association between perceived uncertainty and attitudes and self-efficacy

Moderating effect of uncertainty tolerance

Conclusions
• Oncologists’ perceived uncertainty about GTT is associated with their global attitudes towards GTT. Higher uncertainty is associated with more negative attitudes.
• Moreover, this relationship is moderated by individual differences in oncologists’ uncertainty tolerance (UT). Greater UT buffers the relationship between uncertainty and negative attitudes. Furthermore, UT appears to have differential effects depending on the type of uncertainty (ambiguity, risk, complexity).
• More research is needed to understand the mechanisms by which UT influences perceptions, attitudes, and practices regarding GTT and other uncertain medical interventions.

References

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