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Advancing the development of a genetically-informed behavioral intervention to promote tobacco treatment and cessation

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Genetic variation in nicotinic receptor subunits explains differences in smoking behaviors and risk of smoking-related diseases. Personalized genetic risk results specific to smoking may motivate engagement in tobacco treatment, yet this is largely untested. We developed a personalized genetic risk communication tool (called '*RiskProfile'*) and examined acceptability and potential behavior change among current smokers.

Current smokers (n=108) were enrolled in a single arm trial with three visits. At Visit 1, participants completed a baseline assessment and genetic testing via 23andMe. Participants' raw genetic data (*CHRNA5* variants) and smoking heaviness were used to create a tailored *RiskProfile* tool that communicated personalized risks of smoking-related diseases and evidence-based recommendations to promote cessation. Participants received their personalized *RiskProfile* at Visit 2, approximately 6 weeks later. Participants completed follow-up assessments at Visit 3, 30 days after receiving *RiskProfile*.

Of enrolled participants, 83% were retained across study visits. Acceptability of *RiskProfile* was high (*M*=4.4; *SD*=0.6 on scale of 1 to 5), and 89% of participants demonstrated accurate recall of key *RiskProfile* messages. Following intervention receipt, 37% of current smokers reported increased desire to use smoking cessation pharmacotherapy, and 21% reported initiating smoking cessation pharmacotherapy. Additionally, cigarettes smoked per day decreased between receipt of *RiskProfile* and 30-day follow-up [11.3 vs. 9.8, difference=1.5, 95% CI (0.6—2.4), *p*=.001].

A personalized genetic risk communication tool was found to be highly acceptable and associated with increased treatment use and reduced smoking. This study reflects an innovative application of genomic data to personalize and promote use of evidence-based tobacco treatment.