Slips have been identified as a leading cause of falls and injuries in the home and work environments. A slip is expected to occur when the utilized coefficient of friction (COF,) of an individual exceeds the available slip resistance of the floor surface (Figure 1).

**Methods**

**Subjects**
Fifty-two healthy adults (28 males, 24 females; 26 ± 4 years; mass 78 ± 18 kg) participated.

**Instrumentation**
- AMTI force plates (1200 Hz; 4th Order, 45 Hz low-pass Butterworth filter)
- VICON 6-camera system (120 Hz)
- English XL VIT (Figure 2)

**Procedures**
- Ground reaction force and kinematic data were recorded simultaneously as subjects walked along a 10-m walkway
- Participants wore Rockport shoes and walked at a self-selected speed under conditions of normal and reduced floor surface slip resistance
- Subjects were not told during which trial the contaminant (WD-40) would be applied, nor the location of the contaminant.
- Participants wore a fall-arresting body harness attached to an overhead trolley to ensure safety
- Four measurements of the available slip resistance were recorded following the slip trial (Figure 4)
- Four measurements of the available slip resistance were recorded following the slip trial (Figure 4)
- Subjects were not told during which trial the contaminant had been placed. On the average, the self-selected walking velocity of the remaining 38 participants was 97 ± 13 m/min, the mean peak COFw was μ = 0.21 ± .04, and the average available slip resistance was μ = 0.23 ± .04. Fourteen of thirty eight subjects (37%) experienced a heel slip during the trial in which the contaminant was applied.

**Results**
- Fourteen of the original 52 subjects were excluded from final analysis as they either perceived in advance that the surface might be slippery (n=3) or they did not fully step on the force plate where the contaminant had been placed. On the average, the self-selected walking velocity of the remaining 38 participants was 97 ± 13 m/min, the mean peak COFw was μ = 0.21 ± .04, and the average available slip resistance was μ = 0.23 ± .04. Fourteen of thirty eight subjects (37%) experienced a heel slip during the trial in which the contaminant was applied.

**Slip Resistance Difference** was a significant predictor of slip outcome (p = 0.004; Figure 5, Table 1). Overall the model correctly predicted 90% of the slip outcomes, and accounted for 49% of the variance in slip outcomes (R² = .485).

**Available Slip Resistance** also significantly predicted slip outcome (p = 0.012; Figure 6). Overall, the second model correctly predicted 79% of the slip outcomes, and accounted for 16% of the variance in slip outcomes (R² = .162).

**Discussion**
- Available slip resistance, as measured by the VIT, can accurately predict slip events.
- Knowledge of the available slip resistance, in combination with an individual’s peak COFw, allowed for the greatest accuracy in predicting slip outcome (90%).
- With knowledge of only the available slip resistance, the accuracy of prediction was reduced to 79% over the range of floor surface slip resistance values evaluated in this study.

**Conclusions**
- Knowledge of an individual’s peak COFw, and the available friction (as measured by the VIT) can be used to predict the probability of a slip event during level walking in young adults. Use of the VIT to assess floor surface slip resistance in the work and home environments may provide valuable information to reduce the risk of slip and fall related injuries.
- As measures of static coefficient vary across tribometers, the relationships reported in the current study will likely apply to the VIT only. However, other tribometers could be assessed using similar procedures.

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