

# Use of a Smartphone Application for Prompting Oral Medication Adherence Among Adolescents and Young Adults With Cancer

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**OBJECTIVES:** To explore the feasibility and acceptability of use of a smartphone medication reminder application to promote adherence to oral medications among adolescents and young adults (AYAs) with cancer.

**SAMPLE & SETTING:** 23 AYAs with cancer from a Children's Oncology Group–affiliated children's hospital and a National Cancer Institute–designated comprehensive cancer center in Salt Lake City, UT.

**METHODS & VARIABLES:** Participants were asked to use the application for eight weeks. Data on application usage were obtained from a cloud-based server hosted by the application developers. Weekly self-report questionnaires were completed. Feasibility was assessed through participants' usage and responses. Acceptability was assessed through participants' perceived ease of use and usefulness.

**RESULTS:** Almost all participants used the application at least once. More than half reported that they took their medications immediately when they received reminders. Participants also reported that the application was easy to set up and use, and that it was useful for prompting medication taking.

**IMPLICATIONS FOR NURSING:** Nurses could continue to test the efficacy of integrating e-health modalities, such as smartphone applications, into efforts to promote medication adherence.

**KEYWORDS** medication nonadherence; adolescent; young adult; e-health; oral medications

**ONF, 45(1), 69–76.**

**DOI** 10.1188/18.ONF.69-76

During the past 30 years, adolescents and young adults (AYAs) with cancer have experienced less improvement in survival than children or older adults with cancer (Albritton & Bleyer, 2003; Bleyer, 2002; Bleyer, Viny, & Barr, 2006). Suboptimal adherence to oral cancer therapy medications has been cited as a key contributor to adverse cancer outcomes, such as disease relapse (Bhatia et al., 2012, 2014; McGrady, Brown, & Pai, 2016).

Rates of medication nonadherence are significant among AYAs, with a reported incidence of 27%–63% across studies (Butow et al., 2010; Kondryn, Edmondson, Hill, & Eden, 2011; Landier, 2011; Partridge, Avorn, Wang, & Winer, 2002). In addition, rates of nonadherence are higher among AYAs compared with younger children (Bhatia et al., 2012). Reported reasons for nonadherence to oral medications include factors related to medications themselves (e.g., side effects, frequent or complex dosing), as well as factors particularly relevant to AYAs, such as forgetting, having lifestyle disruptions, and lacking physical and social support for medication taking (Hall et al., 2016; Hullmann, Brumley, & Schwartz, 2015; McGrady et al., 2016; Verbrugge, Verhaeghe, Lauwaert, Beeckman, & Van Hecke, 2013; Wood, 2012). Medication nonadherence among AYAs is a particularly salient issue for nurses who may be among the first on the multidisciplinary team to recognize nonadherence or factors contributing to it. With their frequent direct contact with patients, nurses are well positioned to intervene with strategies to encourage adherence (Winkeljohn, 2007).

The development of interventions to promote oral medication adherence among AYAs with cancer is an urgent priority because they are scarce and limited data exist to support their clinical use (Burhenn