

Introduction Iron deficiency anemia (IDA) is the most common anemia globally, and typically results when the intake of dietary iron is inadequate for hemoglobin synthesis.^{1–3} Anemic pregnancy refers to a hemoglobin level below 11 g/dL, or a hematocrit level below 33%.¹ The global prevalence of anemic pregnancy has decreased only slightly, from 41.6% in 2000, to 40.1% in 2016; prevalence ranged between 19.6–63% in developing countries and 17.4–34.4% in developed countries.⁴ A national health survey of Indonesia reported a 37.1% rate of anemic pregnancy during 2013,⁵ which has since increased to 42%.⁴ Furthermore, postpartum hemorrhage (30.3%), hypertension (27.1%), and infection (7.3%), which were aggravated by the condition of anemia, were the leading causes of the maternal mortality rate of 359 deaths per 100,000 live births.⁶ In Indonesia, anemia programs for pregnancy are mostly delivered through antenatal care (ANC); hemoglobin measurement, education on dietary intake, and distribution of iron–folic acid (IFA) tablet at a minimum of 90 tablets – one tablet per day.⁶ In fact, studies have revealed that 49% of pregnant women in Indonesia suffer from insufficiency of energy and up to 85% from insufficiency of iron.⁷ Yet, only 33.3% of pregnant women take IFA tablets at the recommended rate of one tablet per day for 90 days.⁵ Tailoring culturally resonant nutrition education and counseling about diet during pregnancy, lactation, weight gain during pregnancy, and monitoring of the progress of maternal nutrition are all areas of needed attention.⁸ Thus, we took the initiative to develop an anemia teaching material that adjusts with cultural and local context. Our intervention program was designed to provide an individual education session using the anemia pictorial handbook in conjunction with individual counseling sessions to overcome the barriers to an iron–rich diet and proper IFA intake behavior among 45.9% of anemic pregnant women in the province of Aceh, Indonesia.¹⁹ We invited first time of ANC visitor to participate in the study, to evaluate the effects of the intervention program on hemoglobin and hematocrit levels in their third–trimester pregnancies (primary outcome), birth weight, knowledge of anemia, iron–rich food intake, and rate of IFA intake (secondary outcome). The use of printed education materials promoted an improvement in healthy eating in low–middle income countries (LMICs).⁹ The materials provide permanent and reliable information after verbal communication and education.¹⁰ Beyond this, there are basic difficulties involved in using information and communication technology in LMICs, such as inadequate physical infrastructure, insufficient access to the hardware for the majority of the population, and lack of the requisite skills for using them.¹¹ Likewise, in the province of Aceh, although the percentage of households which owned and were versed in the use of cellular phones was 86.78%, a prevalence of sharing communication devices was indicated, as the percentage of individual ownership of cellular phones was 65.29%.¹² The percentage of households which owned and were versed in the use of computers was 18.5%, and only 46.76% of females accessed the Internet.¹² Thus, we decided to develop the teaching material in the form of a pictorial handbook. Key elements of the HBM focus on individual beliefs about health conditions, which predict individual health–related behaviors.¹³ The model defines the key factors that influence health behaviors as an individual's perceived threat to sickness or disease (perceived susceptibility), belief of consequence (perceived severity), potential positive benefits of action (perceived benefits), perceived barriers to action, exposure to factors that prompt action (cues to action), and confidence in ability to succeed (self–efficacy).^{13,14} Studies in Iran,^{15,16} Ethiopia,¹⁷ and Egypt,¹⁸ showed the effectiveness of

HBM combined with a nutrition education program. The information is suitable for the needs of pregnant women, is presented using words that are easy to understand, and allows behavior changes in accordance with the characteristics of the community and its environment. The anemia pictorial handbook was conceptualized based on the Health Believe Model (HBM) theory.